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of Agricultural Economists

AGRI-FOOD SECTOR IN SERBIA

STATE AND CHALLENGES

Edited by

Academician Dragan Škorić
Danilo Tomić
Vesna Popović

Belgrade, 2013

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INTRODUCTION

Four intensive processes characterize world economy of the late 20th century and in the beginning of the 21st century. These processes are globalisation, trade liberalisation, information and biotechnology. Processes are going to be even more intensive during the 21st century. These processes are present in world agriculture, but also in Serbian society, economy and agri-food sector, even though they are in the late transition. In this monograph, eminent Serbian agricultural economists and rural sociologists have prepared nine papers. Papers are grouped in four parts. Monograph gives analytical and complex insight in Serbian agri-food sector. The authors` intention was to provide colleagues from abroad with quality information and knowledge on Serbian agriculture.

Part One (*Structural Characteristics*) has four papers. In the first paper under title: **Agriculture of the Western Balkan Countries in Globalisation and Liberalisation Processes,** authors analyse the current state of development and competitiveness of western Balkan countries agriculture. For these purposes, the comparisons of the accomplished results and analysis of latest experiences in transition of agriculture of these countries has been made. Comprehensive study was made to indicate the potentials of Serbian agriculture as the leader in this sector among the Balkan countries. Also, it is examined its own position in the globalisation and liberalisation conditions, as well as the process of EU integrations that is under way. The paper analyses the economic development indicators, resource potentials and value indicators of agricultural development. The comparison is applied in order to indicate to potential similarities and differences between countries of the region in the accomplished results as well as the consequences of the implemented economic and agricultural policies. The time frame of the study id from 2004 to 2011 and the sources of data include the World Bank, Eurostat, and studies dealing with this topic that have been conducted so far.

In the second paper under title: **Changes in the Structure of Farms and Producers Associations in the Republic of Serbia**, the author presents characteristics of structural changes of four forms of farms (family farms, agricultural enterprises, agricultural cooperatives, and other legal entities and entrepreneurs) in the period between the two Censuses (2002 and 2012). In addition to quantitative indicators (number of farms, growth index, and share indicators) and macro-regional comparisons (Central Serbia and Vojvodina), a special emphasis is placed on organisational-production divisions and legal forms of all forms of the above-mentioned farms (commercial and non-commercial family farms, "old" and "new", namely complex and specialised agricultural cooperatives and privatised and non-privatised agricultural enterprises) and social-economic effects of structural changes during the last decade of the transition period in Serbia, as well as the necessity of changes of (para)state (chambers of economy and alliances of cooperatives) and expansion of new associations of agricultural producers (owners of family farms) and inhabitants of rural areas. The analyses used different sources of data (farms' censuses and other databases of the Statistical Office of the Republic of Serbia, Privatisation Agency, Agency for Companies' Registers, relevant bibliography, etc.). The main conclusions of the study include: a) processes of reduction in the total number of farms and concentration of land in groups of farms with a larger estates are evident, with diverse intensity, for all forms of farms; b) organisational-production changes aimed at market adaptation to production globalisation processes and trade liberalisation of agricultural-food products are predominant in three sub-forms of the above-mentioned farms - agri-business companies, family farms with larger estates and specialised agricultural cooperatives; c) social-economic effects of structural changes include the winding up of some agricultural enterprises, in particular of farmers' cooperatives with reduction in the number of their employees, as well as "extinguishing" of old and small family farms – which results with demographic emptying of large number of villages and entire regions and increase of poverty of rural population in Serbia.

In the third paper under title: **Development Characteristics of Agricultural Sector in Serbia,** Serbian agricultural sector was discussed by agricultural production and production in agro-industry. The development characteristics of agriculture are analyzed through

production and export performances of the sector, in the period 2005-2011, with a brief presentation of the previous period. The production performances are analyzed through the movement and structure of agricultural production and the level of its partial productivity – labour and land. The export performances are analyzed through the value of agricultural exports with regard to hired labour and land in agricultural production. Trend analyses of Serbian agro-industry are given longer time horizons, in order to compare the pre-transition period with the period of transition. The relationship trends between agricultural and non-agricultural sectors are highly emphasized, as well as the relations in agribusiness between agricultural production and agro industry – food processing and tobacco industries.

In the fourth paper under title: **Diffusion of Knowledge and Innovations in Serbian Agriculture**, authors argue that much growing need for food, food quality improvement, preservation of natural resources in agroecological complexes, improvement of the organization of the production and its economic performances etc. has conditioned the necessity of changes in the production, especially in the way farmers learn about agriculture. Knowledge and innovations necessary for practicing contemporary agriculture are no longer generated spontaneously and by chance. Now, they are result of the systematic researches in agricultural sciences. We present some of the characteristics of the stakeholders within the agricultural knowledge and information system in Serbia. Special attention has been paid to the role of R&D in agricultural sciences, as well as social vitality of the family farms and characteristics of agricultural extension service as relevant factors in the process of diffusion of agricultural knowledge and innovations.

Part Two (*Production and Trade*) consists of two papers. In the fifth paper under title: **Long-Term Structural Changes in the Agrarian Market in Serbia (1990-2010): Cyclicality of Production, Oligopolistic of Demand, Extensive Growth of Export**, author writes that in the last two decades, the trends of the production of agricultural products in Serbia have been pointing at stagnation and decline, the observable instability of the volume, as well as the extensification of the total structure. The dynamics of the agrarian development are characterized by cyclical instability, with significant differences with

respect to the intensity and direction of oscillations between plant and livestock production. The oscillations of plant production move sinusoidally, widely ranging from minus 30 to plus 50 index points, only showing a slightly ascending long-term trend. Livestock breeding records a radical reduction in the reproductive potential, accompanied by substantially smaller production oscillations at the year level (plus/minus six index points). However, the trend line as a whole has a long-term descending direction, especially in the grain-growing regions. Instability and high oscillations in the production of primary agricultural products have causally-consequentially reflected on the total agrarian market, the extensification of the increasing export and the total manifestations of its imperfection, too. The agrarian market is unorganized, with an undeveloped competition policy and, after the unsuccessful ("tycoon") privatization, with broken vertical production-technological, ownership-capital and contractual commitments of primary production, processing and trade. The primary products market is typically characterized by the structure of the complete competition of the offer made by small producers and the most frequently monopolized (oligopolistic, to be more precise) structure of the demand of processers and mega-markets. The similar circumstances (but in the opposite direction) are with the final food product market. Simultaneously, due to its underdeveloped institutions, the state inefficiently sanctions the "market mistakes", i.e. the behavior of those market players who abuse the predominant market position as well as those who endanger healthy competition by exposing contracts in the "grey economy" and so forth. These are also the basic limitations to the development of agricultural production and a growth of (non-raw-material) export, as well as for the stability of producer prices and for lowering relatively high consumer prices of agricultural and food products.

In the sixth paper under title: **Foreign Trade Exchange of Agro-Industrial Products of Serbia**, authors deal with comparative analysis of trends and regional determinants of export and import of agro-industrial products of the Republic of Serbia during the period from 2004 to 2011, as well as with the analysis of foreign trade balance of exchange according to commodity groups and sectors. The paper points to the basic factors that have led to the accomplished results. The average export of agro-industrial products from the Republic of Serbia within the analysed period amounted to 1.7 billion US dollars. Export recorded a significant

increase under the average rate of 18.66% per annum. The highest value of export is directed towards the European Union Member States since it amounted to 799 million dollars on the average, which made almost a half of the total export (47.3%). An insignificantly lower export is directed towards the countries of the CEFTA group and it amounts to 761 million dollars, or 45% of share. Export to the above-mentioned economic group of countries increases more intensively compared to export to the European Union (19.91%). These are dominantly two most significant markets for the Republic of Serbia. The analysis per countries shows that the largest export is directed toward Bosnia and Herzegovina, Montenegro, FYR Macedonia, Germany, and Italy. The average import of agro-industrial products of the Republic of Serbia amounted to 1,108 million US dollars. Import has recorded growth under the average rate of 7.80%. It is evident that the rate of import is far lower than the one of export, which is encouraging. The highest value of import was registered from the European Union Member States, namely 464 million dollars on the average, which made 41.9% of the total import. Import has grown under the rate of 6.12%. Import from the countries of the CEFTA group amounted to 213 million dollars on the average, namely it made 19.2% of the total import. Import from the above-mentioned economic group of countries has been increasing more intensively compared to import from the European Union Member States (18.7%). The largest import comes from the FYR Macedonia, Germany, Brazil, Croatia, and Italy. Republic of Serbia recorded a positive balance of foreign trade exchange of agro-industrial products that made 581 million dollars on the average. It is recording constant growth of positive balance of foreign trade under the average annual rate of 37.6%. Negative foreign trade balance was registered only in the initial year and it amounted to 56 million dollars. However, it recorded surplus of 1,292 million dollars in the last analysed year. A large number of both external, namely factor of macro-economic environment, as well as internal (domicile) factors affected the accomplished results of business activities.

Part Three (*Natural Resources and Rural Development)* contains two papers. In the seventh paper under title: **Sustainable Management of Land, Water and Biodiversity in Agriculture under Climate Change**, authors analyzed problems of natural resources. It is recognized around the world that land degradation, desertification and drought mitigation, improvement of water management and conservation and sustainable use

of biodiversity represent urgent global priorities. FAO strongly argues for priority actions in sustainable and adaptive natural resources management, such as land-use planning and soil, water, ecosystems and genetic resources management in order to improve resilience to climate change. Agriculture has a potential to play the lead role in the sustainable development and climate change mitigation. This is new concept of the climate-smart agriculture that sustainable increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation) while enhancing the achievement of national food security and development goals. Serbia as a candidate country for EU membership, in the pre-accession period seeks to harmonize environmental and sector legislation and practice with the relevant in the EU. It also tries to fulfill the obligations in these areas it has assumed by signing international conventions (UNFCCC, UNCCD, UNCBD, etc.). Nevertheless, delays in by-laws adoption, lack of national strategic documents in agricultural and climate policy, underdeveloped local institutional infrastructure and financial bottlenecks significantly slow down the implementation processes. It is necessary to intensify the state institutional and financial support and to provide a more comprehensive and expert assistance to the farmers both by the science and advisors in activities aiming at the conservation of natural resources in the conditions of climate changes.

In the eight paper under title: **Territorial Capital of Rural Areas: an Example of Analysis of the Potential for Rural Tourism Development in Serbia**, authors study different aspects of territorial capital of rural areas in Serbia in the context of the potential of these areas for rural tourism development. The choice to use territorial capital analysis as the analytical tool is motivated by the fact that the territorial approach to rural development allows for better possibilities for understanding and exploiting the potentials of a rural area, provided that the potentials are reflected in policies of territorial development and supported by global-national (multi)sectoral measures of agricultural and rural policies. The analysis is based on official statistical data and data/information collected by survey research, interviews and focus group meetings. The research included four typical rural regions of Serbia and, for each of them, five dimensions of territorial capital were analyzed: human capital, social capital, economic capital, cultural capital and natural capital. Selected indicators for each dimension of territorial capital were quantified and compared for each region. As expected, the results indicate heterogeneity

of some components of territorial capital, pointing out comparative advantages of the studied regions, which vary significantly. The differences existing in the main development performances of the studied rural areas require application of specific development strategies that would be largely based on regional characteristics of these areas.

Part Four (*Institutional Framework and Policy of Support*) includes one paper. In the ninth paper under title: **Policy of Support to Agriculture and Rural Development,** author deal with the basic questions of the agricultural policy in Serbia. Prejudicing the physiognomy of the agrarian policy in the future is excluded from the analysis. It is because the main focus will be satisfying all requirements to join the World Trade Organization and adapting to the Common Agricultural Policy of EU. Analyzing some measures and instruments of the agrarian policy, we could note that criteria have often been mutually conflicting. Efficiency approximation and consequences of different measures and instruments, at the level that satisfy the volume and quality of statistical material, without getting into the evaluation of the governmental set of measures in some segments of the policy is the primary goal. Comparing the growth rate of expenses for food and agricultural production it's more than obvious that aggregate supply, has exceeded demand in the last 12 years. However, the fact that characterizes the time we talk about is the slowdown of agricultural production growth and the absolute fall of food production since 2007. The parity of economic position of agriculture is predominantly determined by relationship between agricultural products growth and indices of food industry growth. It also exerts influence on the physiognomy and structure of measures and instruments of agricultural policy. The imbalance of supply and demand had unavoidably the price effects reflected in tendentious aggravation of economic position of agriculture. Therefore, the position of agriculture was under the average level of non-agricultural sector. The influence of relative labour productivity and relative prices, in relation to that illustrated in the analysis of the position parity in creating the gross value added, remains more or less unchanged. Serbian agricultural sector has been developed three mutually conditioned tendencies: 1) growth of relative labour productivity; 2) decreases of relative prices of agricultural and food products; and 3) decrease of income elasticity of demand for agricultural and food products. The wide spectrum of interventional – regulative measures is created by combination of all cited factors and

emphasized income and social dispersion within the agricultural sector. The process of political decision-making has brought unstable agricultural policies. Also, it was the main characteristic of the time period after 2000. Although the measures of agricultural policy have solved some of the short-term problems, an extreme uncertainty has been manifested in unfavourable conditions to invest in agriculture. The market liberalization of agricultural and food products has been literally changed, with extremely negative effects on the size of supply. According to the model of EU, Serbia has determined to subsidize agriculture for registered agricultural holdings by paying per hectare and head of livestock. The efficiency of mechanism like that is attained in the combination with price guarantee, and in this paper, it is estimated by price elasticity of agriculture supply. In this paper, the author analyzed measures for agricultural subsidy in case of milk, subsidies of basic inputs as mineral fertilizers and diesel fuel, and the efficiency of foreign-trade system and policy. As very efficient and elastic regulating import instrument, Serbia has kept variable levies for the most important agriculture and food products. According to WTO rules, Serbia has to cancel variable levies and find another efficient protection system. Serbia has signed free trade agreements with EU (Stabilization and Association Agreement), CEFTA countries, Russia, Turkey and Belorussia. With those agreements as another challenge, Serbian farmers have growing import competition.

Editors

AGRICULTURE OF THE WESTERN BALKAN COUNTRIES IN GLOBALISATION AND LIBERALISATION PROCESSES

INTRODUCTION

The problems of development of agriculture, its role and significance in globalised and trends of the world economy that have been more significantly liberalised within the last decades, make the subjects of permanent and comprehensive study in a larger number of paper. In that context, it is necessary to point out that standard development theory that is used in the developing countries emphasises, by the rule, the competitiveness as one of the main objectives. Such policy that is imposed by the developed west assumes, in essence, the totality without diversities and variations, the totality without frictions and conflicts that is governed by perfect awareness, which is not the case in practise. That is why there are large qualitative and quantitative differences in global framework. On the one side, they reproduce poverty and low level of development, and, on the other hand, they reproduce wealth and high level of development. In any case, the German economists proved in the 19th century already that such theories represented the quantification of values without quality, workforce without knowledge and capital without knowledge. The American economist Krugman [9] also points out the same stating three important threats in the use of the competitiveness concept: the *first* is reflected in inadequate spending of the state/public money aimed at affecting the development of country's competitiveness; the *second* leads to a specific kind of protectionism, and even trade wars; and the *third,* most important one, results with inadequate national policies related to the most important development problems. Having that in mind, a sort of confusion related to the selection of an efficient development concept in the globalisation and liberalisation conditions in less developed countries and region, such as the region of the Western Balkan as one of the most underdeveloped regions in Europe is not surprising.

When it comes to the developed countries of the world, the fact is that liberal world order experienced its affirmation in the period from after the World War II all until the end of the 1970s. The intervention industrial

(IP), trade, and technological policies (ITT) were used for promotion of infantile industries and agriculture[1]. This could be said for the period preceding the accomplishing of a high development level when they became competitive. Only then, those countries turn to liberalisation since they have higher chances to succeed compared to less developed countries. In that sense, the developed countries go even further to press less developed countries up to a significant extent to make steps towards more radical liberalisation and international opening. In Serbia, as well as in other western Balkan countries such a trend resulted with drastic decline in development performances. In concrete political-economic conditions, such a phenomenon resulted with unique development disorientation as an even more important development limitation.

It can be noticed that the belief that globalised market, namely the economic liberalism (economic openness and free trade) will automatically create economic harmony is capable of seducing less developed countries [11]. Therefore, it is believed that warnings of numerous authors[2], starting from Friedrich List (which he presented in 1840 already) up to Chang, Ha-J, 2003, Reinert, E., 2006, as well as Brunet, A. and Guichard, J. P., 2011 that a country should not give in to free trade before it gets industrialised are to be taken into account even today from the aspect of conceptual designing of overall and agrarian development. The failures to formulate the development and growth strategies at a macro level can be hardly remedied with instruments and measures of national policy.

1. RESULTS OF THE RESEARCH AND DISCUSSION

1.1. General Economic Conditions in Serbia and Western Balkan Countries

The process of transition of (agro) economy of the Western Balkan countries started in 1989. Despite numerous new laws and regulations that have been harmonised in parallel with the EU legislation, as well as creating of new institutions, all these countries have achieved relatively modest results. Significant, and most of all essential reasons for failure

[1] See more in: [23], [22], [11], [12], [13 and 14].

[2] Among a truly large number of authors who could be analysed in historical perspective, we listed only some of them who are probably less known in this area.

can be found in the fact that transformation and transition processes, by the rule, do not happen within a relatively short historical moment where there are no clear – obvious situations and that accelerated changes in the global framework aggravate and disorient those less developed – require certain preparation period. In those terms, the situation is practically similar to the one in other Western Balkan countries.

The process of privatisation has also been implemented with less success since the enforcement of the Law on privatisation was inadequate in all the countries. The era of the so-called selling of socially owned enterprises started, and with particularly negative results in the sector of agriculture. The funds obtained based on this procedure were not invested in production, investments and new jobs but they were mainly used to resolve the social issues that had pilled up. The orientation towards radical liberalisation in the countries that were practically not ready and that were disoriented caused numerous negative consequences in economic, development, and social spheres. The basis of failure consists of drastic increase of the number of unemployed, deepened poverty, enormous growth of external and internal debt, etc. These problems were even more radicalised during the economic crisis after 2009. In the meantime, only the Croatian application for the EU membership has been accepted and it became a Member State with full membership. Other Western Balkan countries have not progressed much and they are mainly in mutually similar positions.

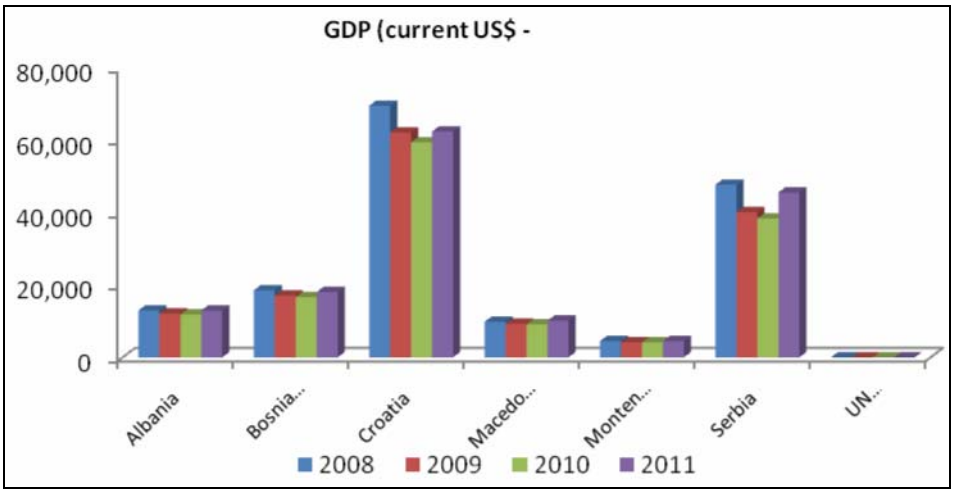
1.2. General Economic Indicators

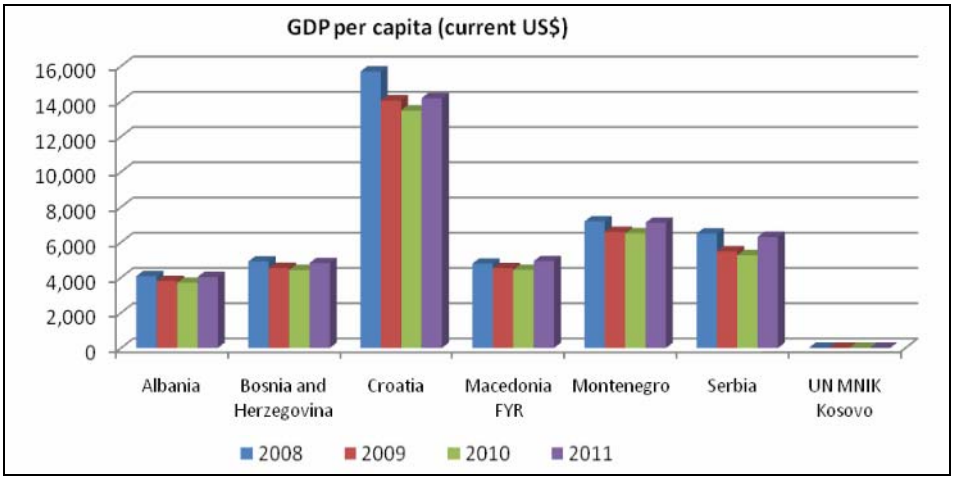
Competitiveness is promoted as the success crucial factor at domestic and international market. Irrespective if it is based on education, entrepreneurship, innovations, or some other factor. At the age of globalisation and liberalisation, it is imposed as an imperative to the Western Balkan countries. However, the achieved level of their competitiveness is relatively low measured by the Global Competitiveness Index (GCI) (Tab. 1).

The competitive position of the analysed countries is primarily the consequence of their inadequate growth and development. Gross domestic product, as the most relevant measure of growth, in its overall expression and analysed per capita indicates a relatively narrowed material basis for growth and development, Figures 1 and 2.

Country (out of 142)	*Rank (2011-2012)*	*GCI (2011-2012)*	*Rank (2010-2011)*
Albania	78	4.06	88
Bosnia and Herzegovina	100	3.83	102
Croatia	76	4.08	77
Macedonia FYR	79	4.05	79
Montenegro	60	4.27	49
Serbia	95	3.88	96
UNMIK Kosovo	n.a.	n.a.	n.a.

Table 1: Global Competitiveness Index, 2011-2012, the rank according to 2010-2011
Source: [6]

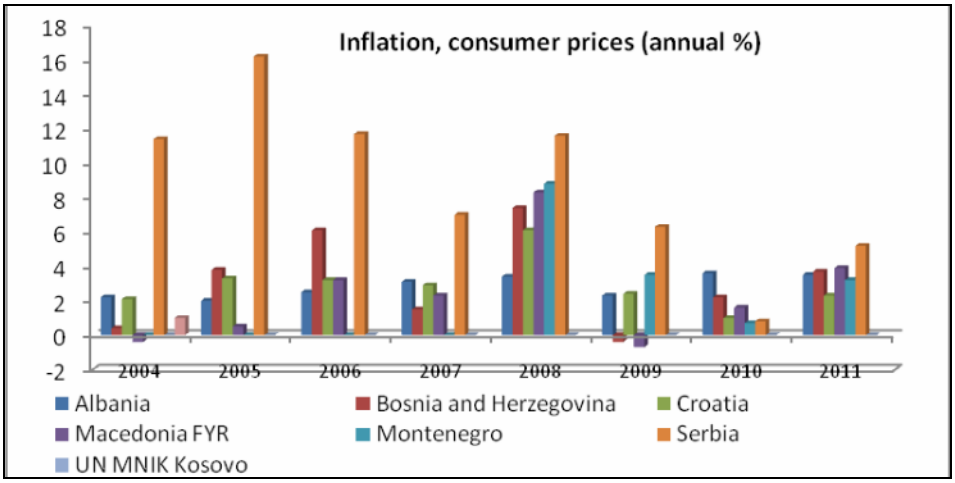


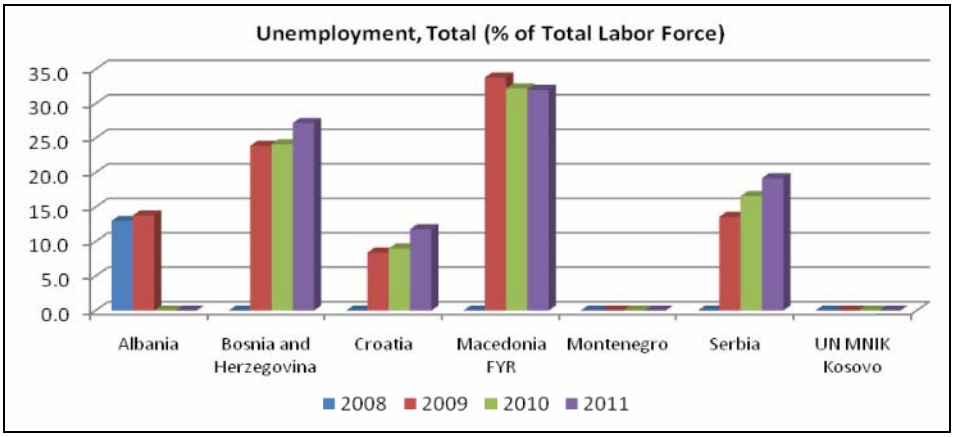


Figures 1-2: Indicators of growth and development of economy of Serbia and Western Balkan countries
Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

It comes out that the highest gross domestic product (GDP) is registered in Croatia and Serbia. This is not surprising since they are two largest and until recently most developed countries of the region. At the same time, its distribution analysed per capita, shows that drastic differences are being alleviated to a certain extent. Thus, Montenegro accomplishes proportionally larger GDP per capita compared to Serbia, which points to a relatively extensive character of growth of Serbian economy.

During the analysed period, certain staggering in basic macroeconomic aggregates was registered in all the countries of the region. This refers to the trends in consumer prices and inflation indicator that is based on them, Figures 3 and 4.





Figures 3 and 4: Macroeconomic indicators of the Western Balkan countries
Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

Slow restructuring and diminishing of a real sector in the analysed countries leads to a significant unemployment level. It can be concluded that the lowest unemployment rate is registered in Croatia, which has come closer to the average unemployment rate in the EU-27, Figure 4. In addition, considering the unfavourable economic structure, the countries of the region are force to import foreign savings indebting themselves or opening themselves for the entering of foreign capital. The trends of inflow of foreign direct investments also point to that, Figure 5.

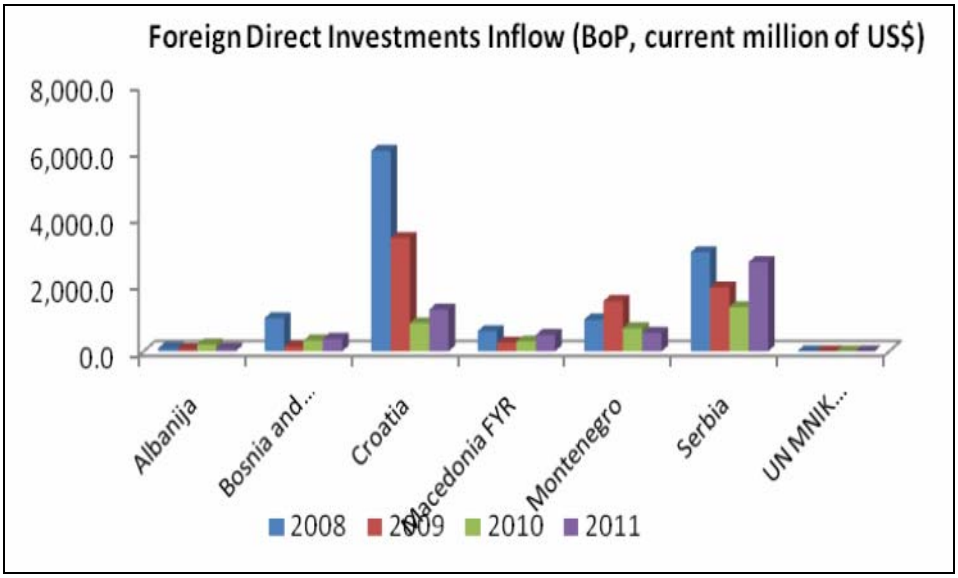
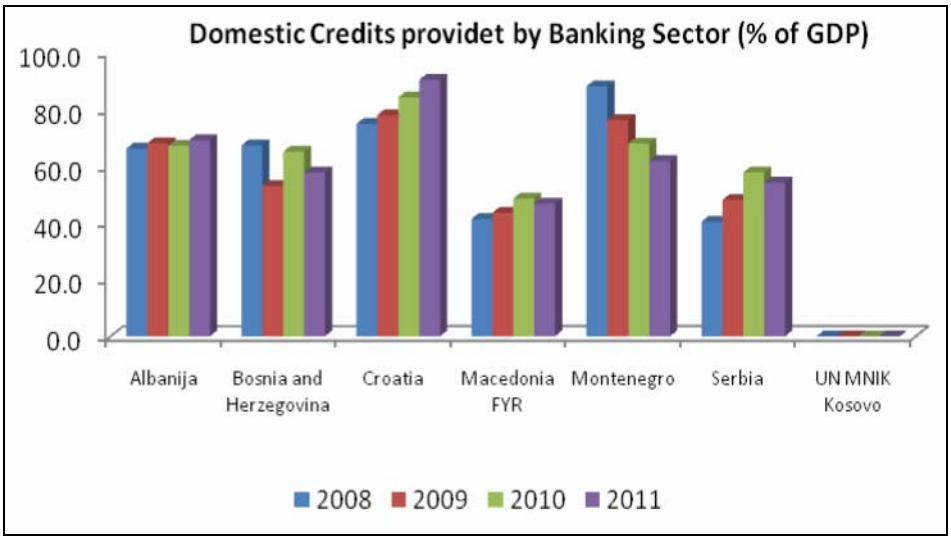
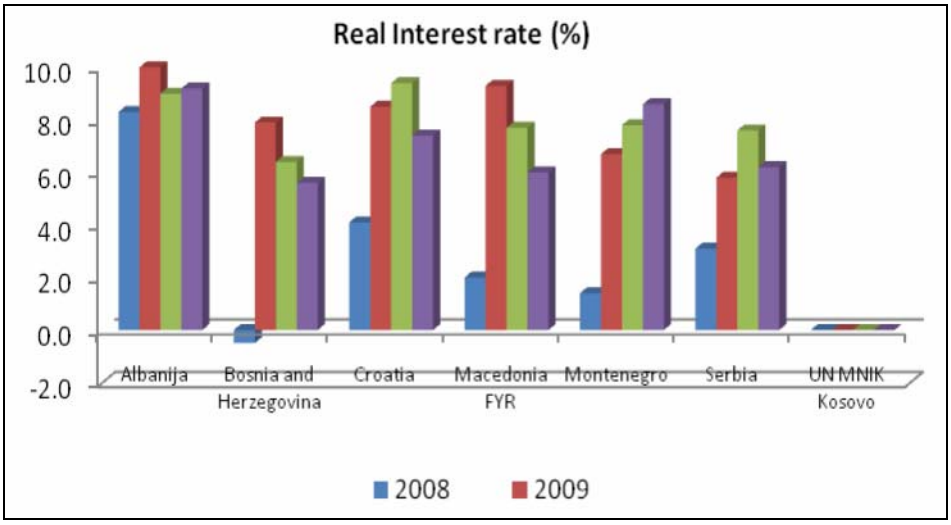


Figure 5: Foreign direct investments of the Western Balkan countries
Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

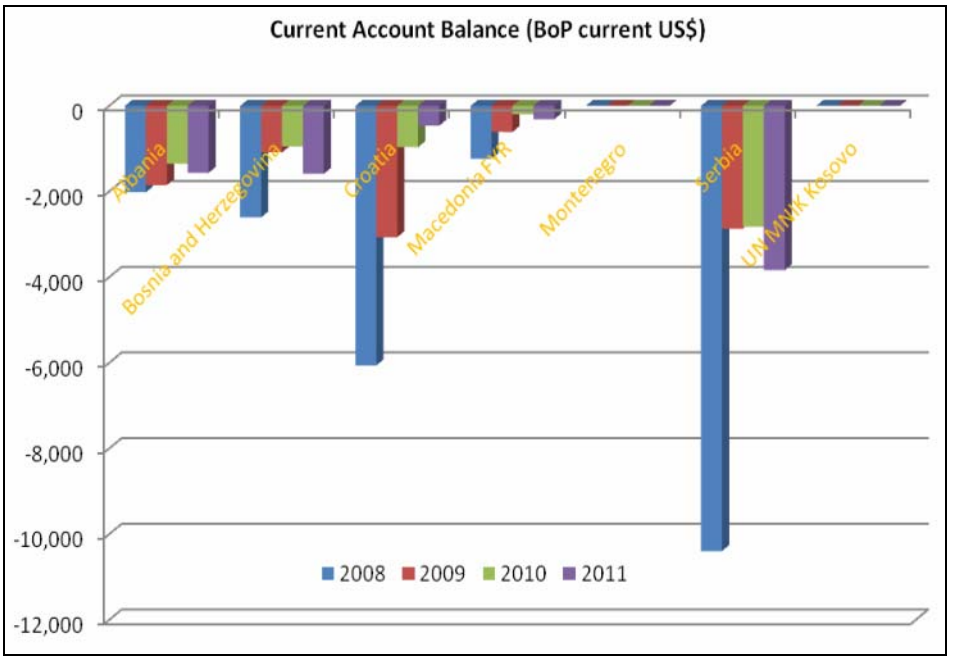
Structure is such that foreign capital is established primarily by widening its own market. Looking from another side, financial power of the Western Balkan countries is such that domestic investors do not invest too much either. The share of domestic loans in the total GDP also indicates that, Figure 6, as well as the level of real interest rates (prices of capital, Fig. 7).

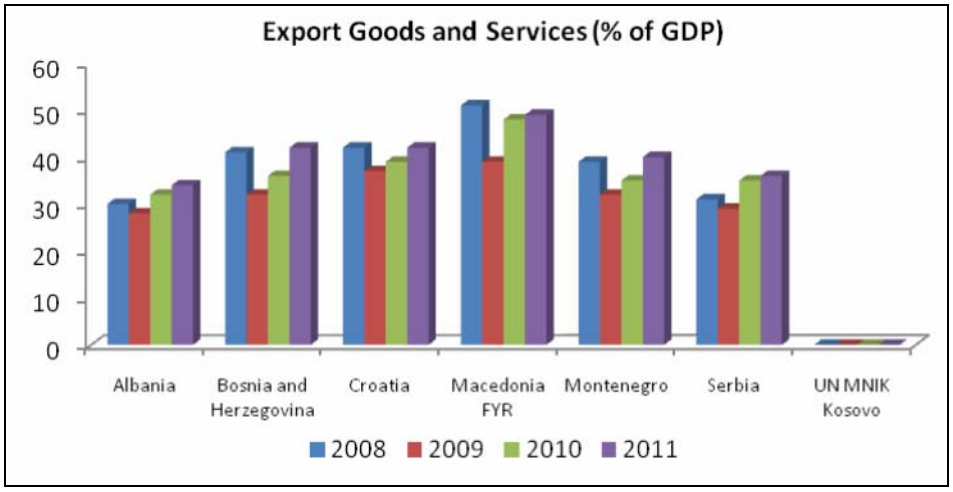




Figures 6 and 7: Amount of share of domestic loans in GDP and trends of real interest rates
Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

Due to that, the expressed trend in the balance of payments of the analysed countries is negative, Figure 8. In that sense, it is important top increase export. However, the structure of export analysed according to factorial product intensity, shows that the prevailing part of domestic export is based on resource (and primary products) and work-intensive products. That is why the scope of foreign trade exchange is still relatively modest, Figure 9.

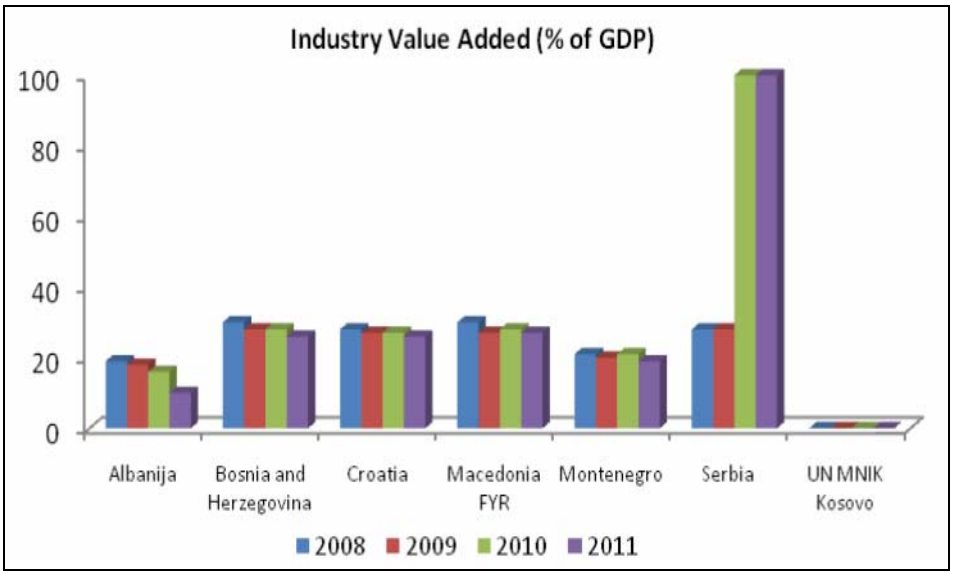


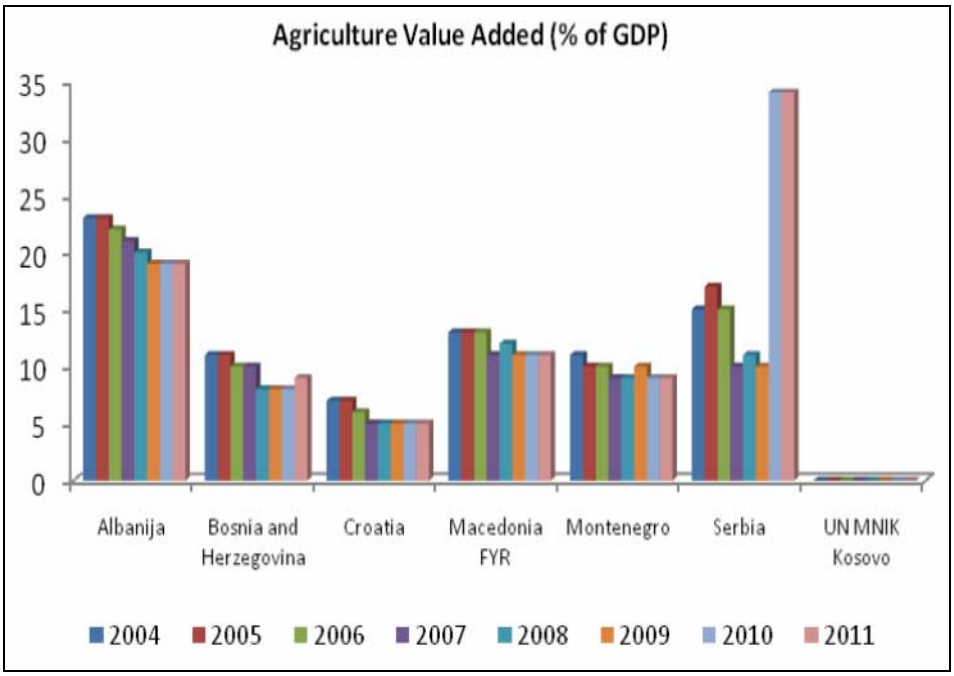


Figures 8 and 9: Balance of payments position and foreign trade exchange level

Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

The results of the real sector can be analysed through the value of added production that is accomplished by two most important economic activities, industry and agriculture, Figures 10 and 11.





Figures 10 and 11: Level of value added of industry and agriculture of the countries of the region

Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

In the developed countries, the main holders of economic are other sectors while, by the rule, the share of agriculture is low, ranging to only several percentages [1]. Figure 12 show that agricultures of the Western Balkan countries confirm this tendency.

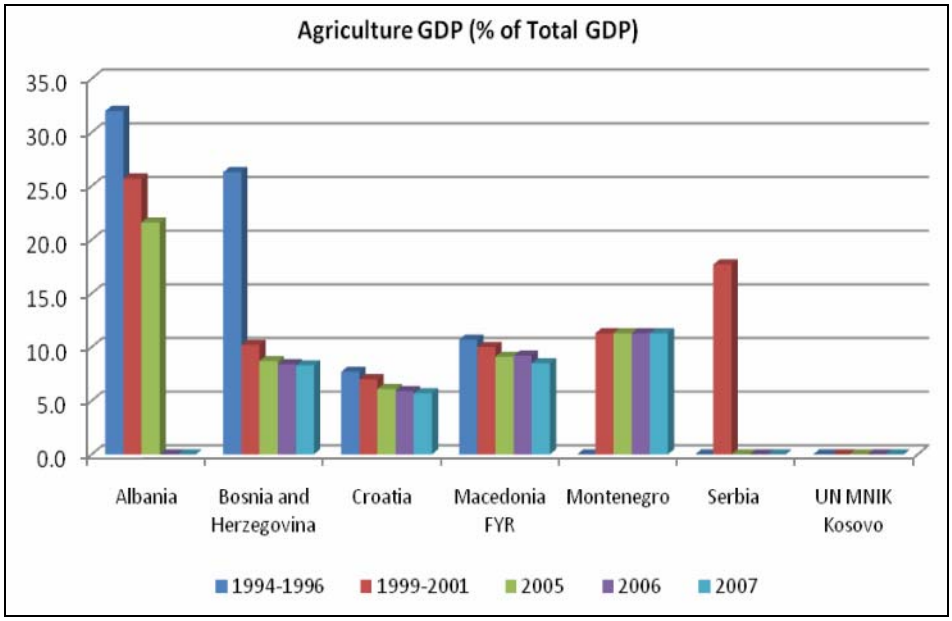


Figure 12: Level of the share of GDP of agriculture in the total GDP
Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

As far as Serbia is concerned, the situation has not changed significantly for years now. That points to the fact that the rest of economy (primarily industry and services) does not manage to accomplish growth that is more dynamic yet, or develop stronger and pull the development of agricultural sector along.

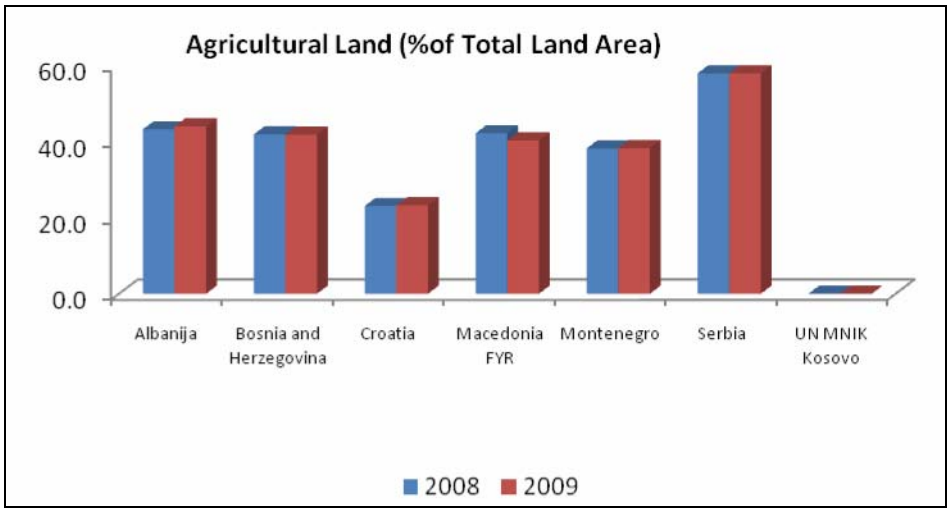
1.3. Resource Indicators

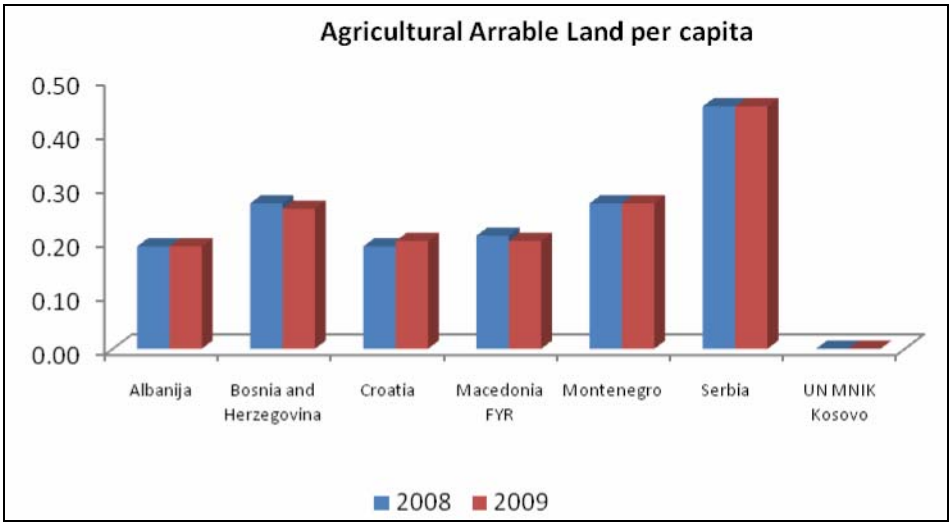
Agriculture of the Western Balkan countries is characterised by several shared indicators that also represent its key limitations. If we start from the land, we should point out that agricultures of the region have not managed to reform the issues related to land and land policy within the processes of

privatisation and transition. The land reform is mainly carried out through restitution, land compensation and land distribution, while setting up of the land market is a rare practice. In addition, we should mention still large role of the state in the agro-business sector instead of the state dealing with creating of more favourable and stable environment that will stimulate private initiative. By the rule, this hides numerous problems. Furthermore, the agrarian policy is often isolated from macro-economic policy, which results with a conflicting character of implementation of instruments and measures.

There is no doubt that the process of privatisation of agrarian sector is one of very important segments in which all Western Balkan countries have made mistakes. Furthermore, in implementation of strategies and policies of agrarian development the states deal much more with healing of consequences, i.e. *ad hoc* measures that were exerted instead of accepting the approach toward orientation to long-term measures that should stabilised and enhance the agro-business sector. There are a number of development strategies without adequate concepts and visions for the future, many politically oriented activities aimed at obtaining confidence of traditionally reliable segment of voters, frequent manipulation with the social status of senilised agrarian population. Social policy is not and it should not be the basis that some Ministry of Economy would use as the foundation for its activities. In such unclarified and undefined approach, the state acts as the manager and entrepreneur, which additionally burden the agrarian reality. Despite all of that, some countries have occasionally made some positive steps forward. However, the fact is that the results of the Western Balkan countries are still highly modest compared to the results of countries recording even some extent of development.

The potential, or as many emphasise, comparative advantages, are in place (although it could be discussed). If one analyses the total amount of agricultural land and the share of arable land in the total (Figures 13 and 14) it could be seen that some countries (primarily Croatia and Serbia) posses relatively high share of agricultural and arable land during the analysed period. In short, that share is close to average values for the EU-12 [4].

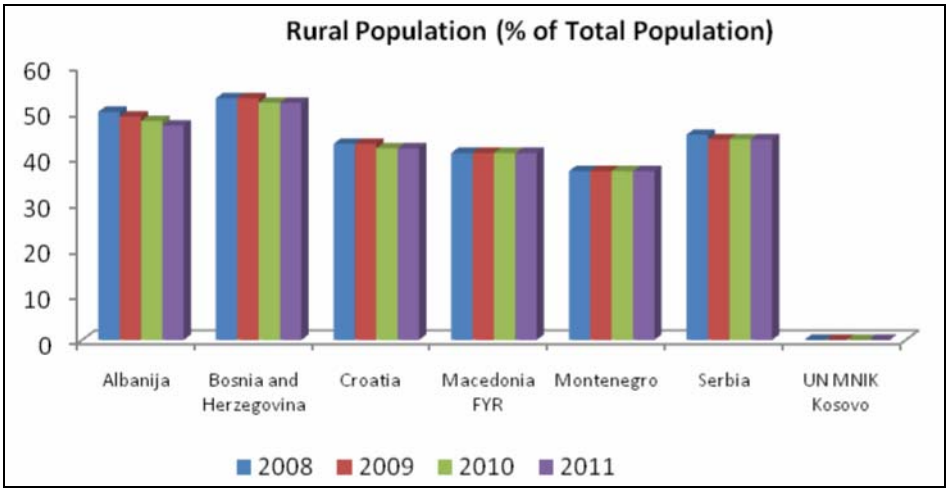


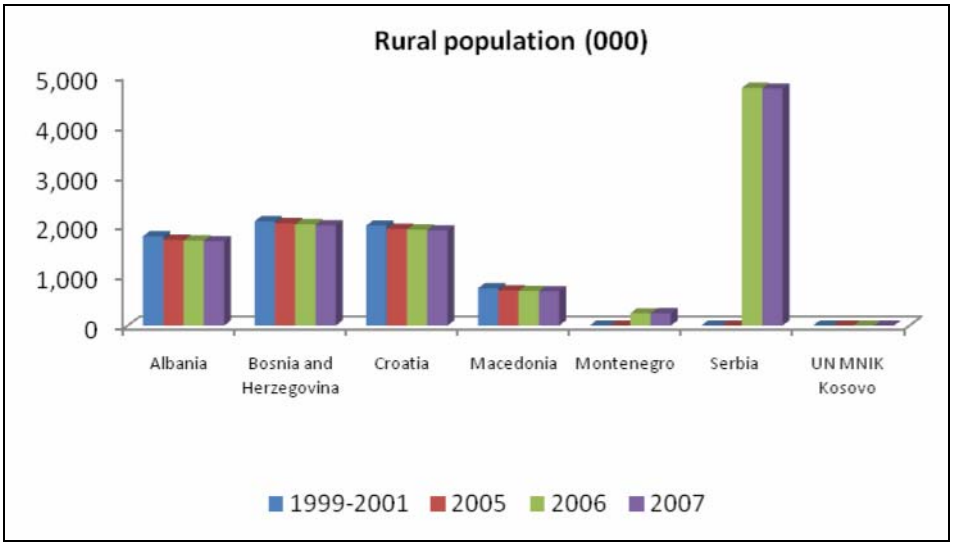


Figures 13 and 14: Agricultural land of the Western Balkan countries
Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

The average size of an estate amounts to only several hectares. It is relatively small and it has not been changed significantly for decades now. In addition, the utilisation method of agricultural land is not adequate either. The implementation of irrigation and drainage is highly modest. Thus, Albania as relatively most underdeveloped countries until recently irrigates from 10 to 17% of agricultural land, while Croatia irrigates only 0.4% and Serbia from 05. to 0.6% (there are mainly no reliable data available for other countries).

In addition to physical resources, another very important factor of development is human capital that creates added value [7], namely human resources, Figures 15 and 16. Their role is to constantly create new or improve the existing technical-technological and management practices in order to increase the level of agricultural production. However, this is also not happening up to a significant extent yet. It remains to a near future to show whether agriculture could reply to such a challenge.



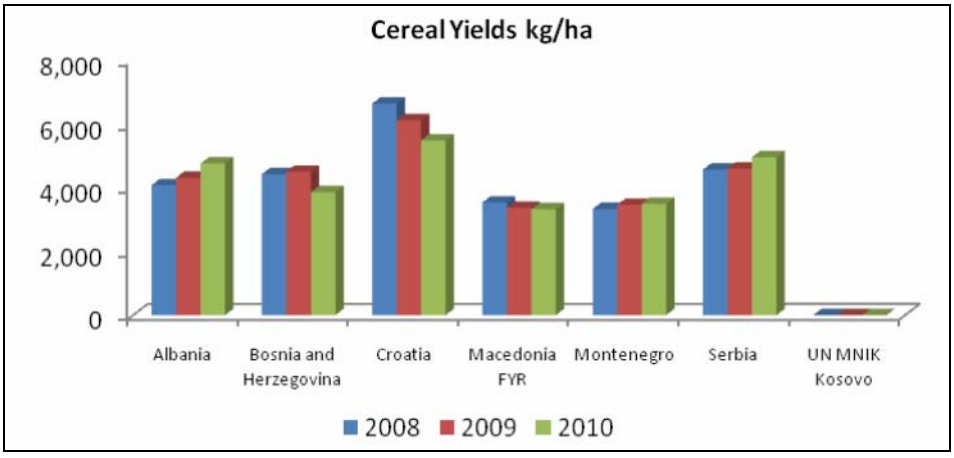


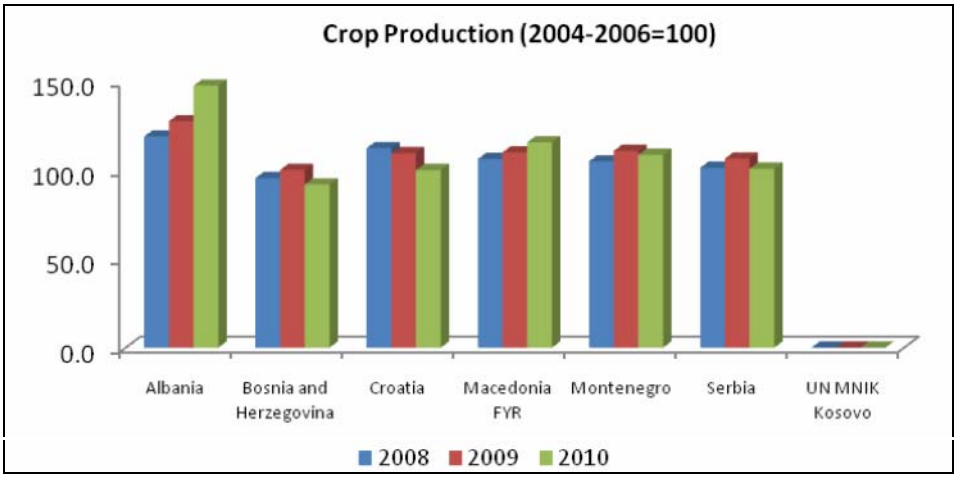
Figures 15 and 16: Rural population of the Western Balkan countries
Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

The share of rural population in the overall Western Balkan region has decreased insignificantly in the period from 1999 to 2007. However, it is still relatively high if we compare it with the data from previous studies [4], according to which 34% of population of new EU Member States live in rural areas. In these countries, the quantitative although human capital, which is still the basic indicator for comparison, emphasises the qualitative aspect of the workforce that is more important in contemporary conditions.

1.4. Indicators of Agricultural Production

The fact is that the development of agriculture in the Western Balkan countries is slowing down gradually. In addition, the differences in productivity (yields per unit) that have been expressed between the countries until now are being gradually neutralised. The countries that have been lagging behind until recently are currently recording more significant steps forward in terms of growth of productivity, while Serbia, for example, as traditionally important agricultural producer, has progressed slower in technological terms. The consequence is that other countries, although smaller in surface, and until recently much more underdeveloped, have come closer or even exceeded the productivity level of some agricultural crops of Serbia, Figures 17 and 18. This can be understood as a warning since the increase of production in the future will largely depend on the yield growth. It should be added that yields have been staggering within the last three decades.





Figures 17 and 18: Cereals yields and accomplished plant production
Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

Similar can be said for livestock production. It has been affected even more with unstable conditions for doing business even more, as well as with frequent changes and inadequate measures of agrarian policy that are practised in the Western Balkan countries. This does not provide the conditions for progress to livestock breeding at all since the results of this branch are accomplished within a multi-annual approach, Figure 19.

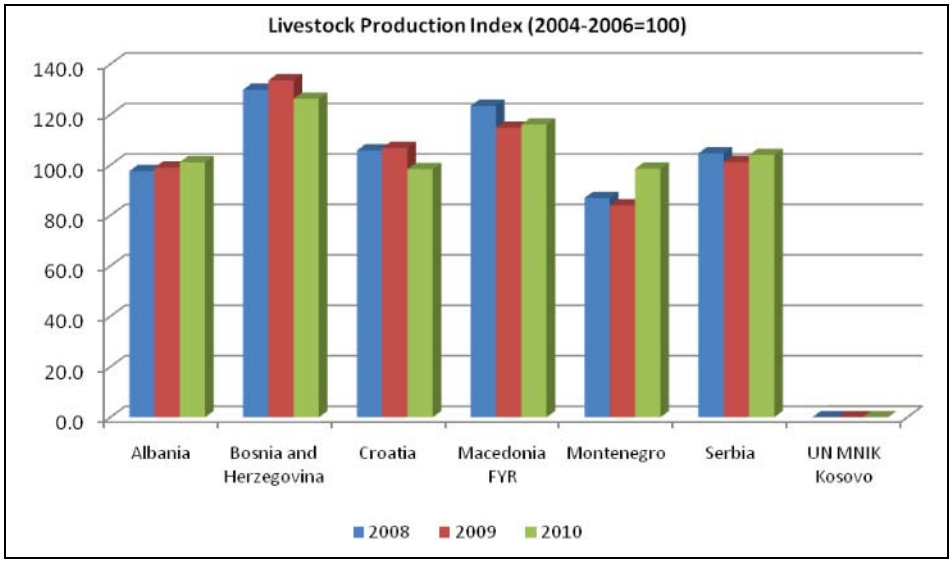


Figure 19: Livestock production in the Western Balkan countries
Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

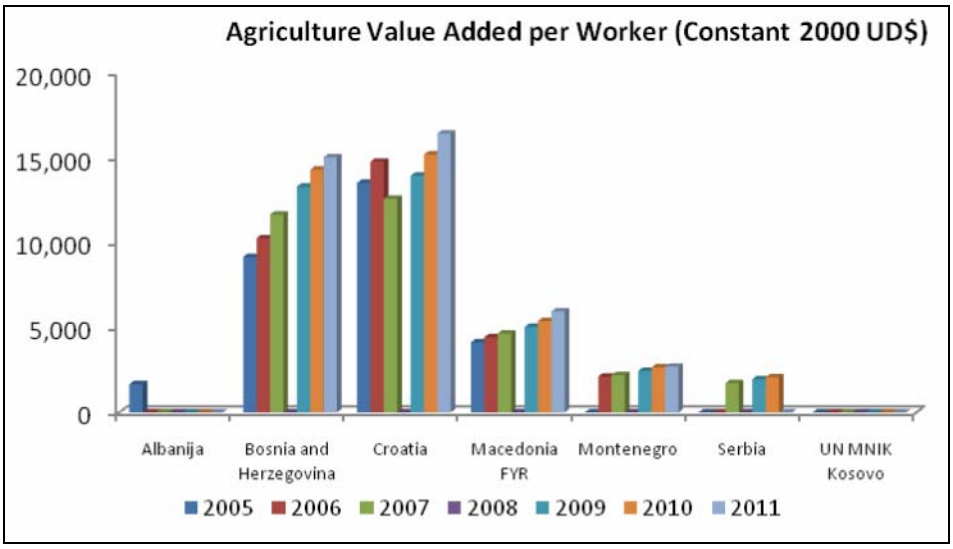
That refers in particular to cattle breeding as production where positive results take up to ten years. In connection with that, it can be expected that the development of cattle breeding will be based on production that is more intensive and the so-called industrial methods in the future.

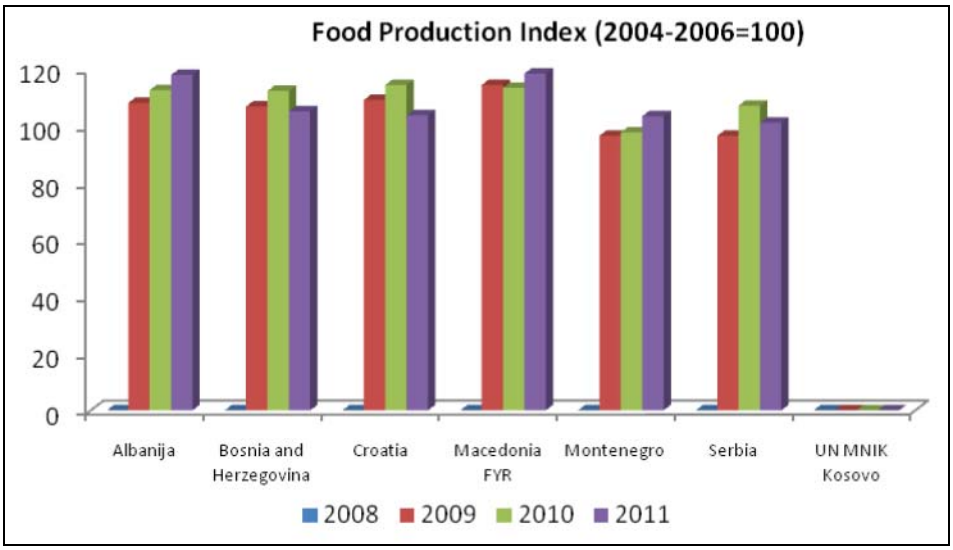
According to the applied concepts in livestock production, it is evaluated that specialised agricultural production units based on industrial and commercial principles will be created largely in the future period instead of production at agricultural holdings. Within the last few years, industrial livestock production has grown twice faster than production in mixed farmers' systems, and even three times faster than production in the system of pasture based breeding method.

1.5. Value Indicators of Agriculture

Added value of agriculture analysed per employee represents the success indicator of this sector and a good basis for mutual comparisons, Figure 20. The overall picture is also completed by the fact that agricultural production as the support to food production industry in the countries such as Serbia has not experienced more significant growth lately. Looking via food production index, Figure 21, we can see that Serbia and Montenegro have been lagging behind significantly recently according to the displayed dynamics.

Concerning benchmarking of the total international trade of the countries of the region is indicative. However, their size and agrarian potential should be taken into the account. Thus, the existing differences are not always the consequence of a better level of internationalisation of a certain country but actual needs to substitute the missing products through import (this refers in particular to products typical for the region of analysed countries). At the same time, export is the consequence of the relationship that is established between the scope of the achieved production and one’s own needs for the produced commodities, as well as the level of the achieved specialisation in certain agrarian segments.



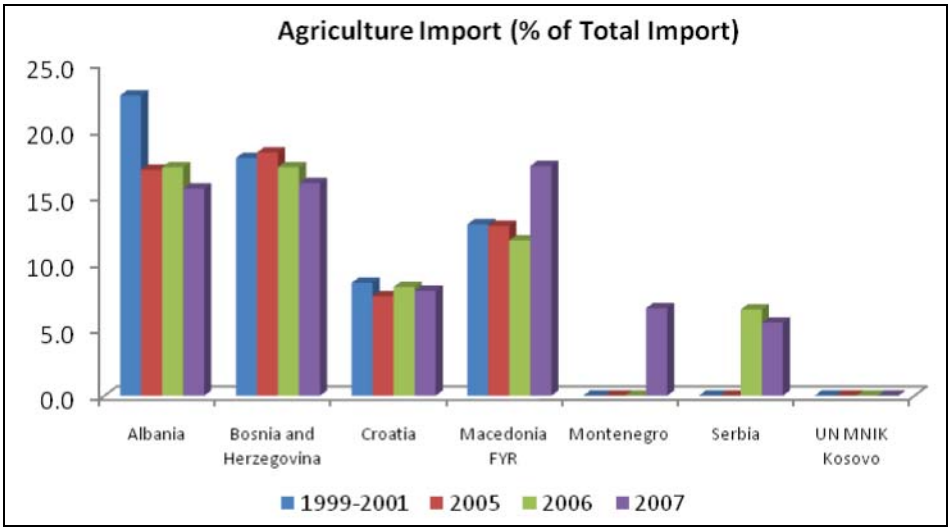


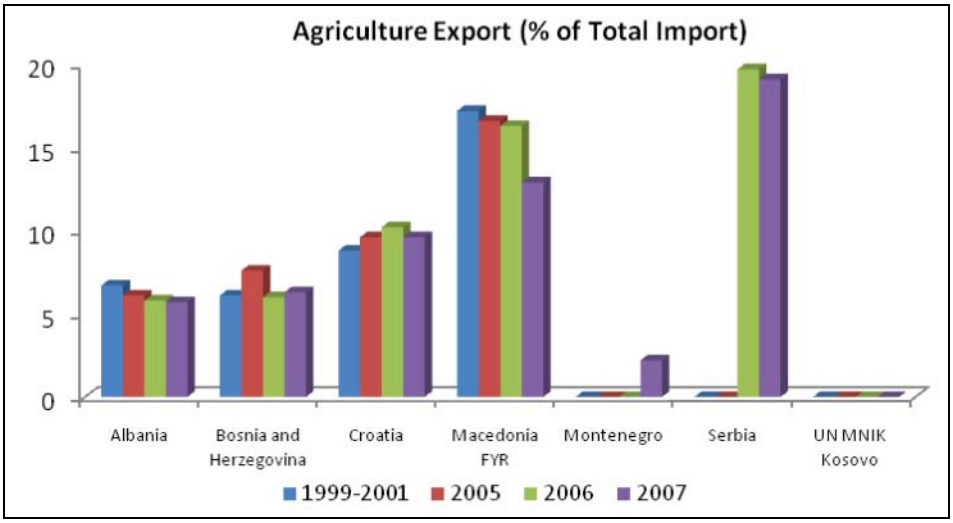
Figures 20 and 21: Value added of agriculture per employee and Food ProductionIndex

Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

The CEFTA Agreement, which was signed by the Western Balkan countries, including Moldova, has not been implemented up to a significant extent yet. This has improved the conditions for further fostering of investments, widening of trade of goods and services with

clear, stable, and predictable rules. Previous studies of authors from the region [24, 8, 21, 3], indicate that CEFTA Agreement has a positive impact on the structure and scope of foreign trade between the Members States. However, the steps forward are still small and they differ from country to country, Figures 22 and 23.





Figures 22 and 23: Import and export of agriculture of the Western Balkan countries

Source: [25] and author's calculation. Data for UN UNMIK Kosovo are not available.

Hence, FRY Macedonia is specialised in export of wine and vegetables and its export is significant compared to other countries. Serbia is the largest exporter and the smallest importer. It exports mainly the products with a low level of value added (corn, raspberry, sour cherry, livestock, wheat, etc.). Import is mainly directed to products that cannot be grown in Serbia (southern and exotic fruit, aquaculture, and marine culture, etc.). Croatia is also interesting. Due to a significant scope of tourist services it provides, Croatia imports a lot of products in order to supplement domestic demand. On the other hand, it exports less as well because the largest portion of production is placed to foreigners at its own market. However, the fact is that it is still not self-sufficient in a certain number of products and its trade balance of agriculture is somewhat more modest.

CONCLUSIONS

Agriculture is one of the segments of economic system of every country within which it is very important to accomplish a satisfying level of competitiveness whereby one should not forget the fact that success in international proportions cannot be expected without previously achieved high level of competitiveness at the domestic market. When it comes to the Western Balkan countries and Serbia in particular, the achieved competitiveness is relatively low. It is characterised by a high share of products with a low value added level, inadequate quality, insufficient quantity of agricultural products and their high fluctuations year in year out, as well as a low price competitiveness, etc. This is the consequence of numerous factors, primarily of exogenous and endogenous nature.

The previous development of (agrarian)economy in Serbia and the Western Balkan countries is causally and consequently connected with the development flow in the segment of implementation of appropriate industrial policies [12 and 13]. Their absence and/or inadequate implementation, in parallel with the process of destabilisation of economy were the reason because of which the retrograde processes were expressed within the last decades. They have leaded the overall economy, meaning agro-economy as well, from the level of medium developed to the level of underdeveloped and impoverished economy. With respect of that, significant limitations of development occur that are based on the offensive IP, which being latent have now come onto the surface. The level of the accomplished GDP, GDP per capita, inflation and unemployment rate, etc. also point to that.

Limitations at both macro and sector levels occur constantly. First, we should point out the property structure as historically conditioned determinant, which affected significantly the freedom of proprietary decision-making and economic motivation, on the one side, and determined the co-ordination mechanism at a macro and sector level, on the other side. This has resulted with a wrong conceptual designing of development strategies and their frequent changing without significant results. The relationship toward the markets is still inadequate. The market of goods and services is, by the rule, administered. A similar situation was present at the markets of real estate, workforce, and capital, which caused important deformities so that many stakeholders in agro-business decayed in the transition process. All this was accompanied by the limitation conditioned with the method of legal and institutional organising of the agro-business sector and the main manager in agriculture is the state. In such conditions, the solutions are partial and with significant delay in relation to the current state so that results are modest or annulled. By the rule, the countries deal with the current problems, i.e. in a short-term frame, while setting of the system onto stable foundations does not happen, or it is left for the „better" times. Therefore, based on the conducted studies, several important steps may be suggested for the forthcoming ten-year period:

- Necessity of completion of economic-system reforms in the countries of the region in compliance with the concept of macroeconomic and agrarian (rural) development that should be re-defined based on the system decentralisation and wider participation of interested parties;
- Providing of legal and institutional support to the growth and development processes;
- Establishing of the market of goods and services as well as factors such land, capital, and labour;
- Development of adequate industrial policies based on the selection of priorities of development in each country;
- Investing into human capital and providing for technical-technological development (innovation and transfer processes) supported by information technologies;
- Accelerating of the process of European integrations aimed at accomplishing better effects in the fields of globalisation and liberalisation of development efforts.

They are all the assumptions of more efficient business conducting, raising of the level of economic development and growth that should be accompanied by appropriate instruments and measures that are not in mutual conflict as it is the case when there are no clear orientation and elaborated development concept. This is also the guarantee of successful integration into the European Union and more efficient positioning in global and largely internationalised and liberalised development trends.

ACKNOWLEDGEMENT

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CHANGES IN THE STRUCTURE OF FARMS AND PRODUCERS ASSOCIATIONS IN THE REPUBLIC OF SERBIA[3]

INTRODUCTION

Previous studies of structural changes of farms in Serbia have traditionally analysed three forms of farms that are recognisable in legal and organisational-economic sense: *family farms (FF), agricultural enterprises (AE),* and *agricultural cooperatives (AC).*

Based on the initial results of the Census of Agriculture from 2012 [2] – adjusted with the number of legal entities that did not have an active status at the time of the Census conducting and that disposed with land surfaces and other corrections made by the Statistical Office of the Republic of Serbia (SORS) after publishing of the results of the Census from 2012[4] and based on the share in the total number of all forms of registered farms (631,818 farms) and registered total surface of utilised agricultural land in Serbia (3,430,755 ha) the following was found:

- Traditionally dominant are family farms (99.4% of farms and 82.2% of land) with a very small land size (4.55 ha);
- They are followed by agricultural enterprises (0.2% of farms and 10.0% of land) with the largest average land size (335.00 ha), and
- Agricultural cooperatives (0.1% of farms and 1.4% of land) also with relatively larger land size (170.51 ha) (Table 1).

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[3] The paper is the result of the research within the Project 179028 financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia [1]

[4] Thanks to supplementary activities of the Statistical Office of the Republic of Serbia in the period following the publishing of the publication titled Census of Agriculture in 2012 – the initial results [3] until July 16th, 2013.

Farms	All farms		"Landless" farms			Utilised agricultural surface		
	Number	%	Number	%	Share	ha	%	ha/farm
FF	28,311	99.4	9,415	88.6	1.5	2,818,545	82.2	4.55
AE	1,358	0.2	331	3,1	24.4	344,041	10.0	335.00
AC	421	0.1	144	1.4	10.6	47,231	1.4	170.51
OLEandE	1,728	0.3	731	6.9	42.3	220,939	6.4	221.60
Total	631,818	100.0	10,621	100.0	1.7	3,430,755	100.0	5.55

Table 1. Main indicators of certain forms of farms in Serbia (2012)

In addition to legally and organisationally clearly differentiated two forms of farms with the status of "legal entities" (agricultural enterprises and agricultural cooperatives), the Statistical Office of the Republic of Serbia registered the *farms belonging to other legal entities and entrepreneurs (OLEandE)* [3: 43-44], which were not the subject of separate studies in previous agro-economic bibliography.

Since the number of farms of other legal entities and entrepreneurs is both absolutely and relatively significant (1,728 farms, or 0.3% of the total number of all farms in Serbia), namely that it is almost equal to the sum of the total number of agricultural enterprises and agricultural cooperatives (1,779 farms), that this group of farms uses 6.4% of total agricultural surface (almost five times more than agricultural cooperatives, namely 64.2% of the surface used by agricultural enterprises) and that the average farm size makes 221.60 ha, their structural characteristics were analysed as a special group of farms registered in Serbia (2012). According to the information obtained by author, this is the first paper in the available agro-economic reference bibliography in Serbia that analyses separately, due to the above-mentioned absolute and relative indicators of their potential significance for agriculture of Serbia, the land size structure of farms belonging to other legal entities and entrepreneurs.

In previous agro-economic analyses of structural characteristics of farms in Serbia we can distinguish two types of papers: a) those dealing with family farms, and b) those dealing with agricultural enterprises and agricultural cooperatives.

Structural changes of family (individual) farms have been analysed much more compared to two other forms of farms in Serbia – agricultural enterprises and agricultural cooperatives. These differences in frequency of

the study are conditioned by objective reasons, namely available databases on Censuses encompassing certain forms of farms.

Namely, before the last Census of Agriculture from 2012 – when all forms of farms were registered, the last complete Census of Agriculture was conducted in the remote 1960, and based on a sample in 1969 as well. This classifies Serbia, namely formerly Yugoslavia, as the country where Censuses of Agriculture, as the elemental database for creating of agrarian and rural policies, used to be neglected for half a century.

That is why it is not possible to present the analysis of structural changes of different forms of farms of legal entities and entrepreneurs (agricultural enterprises, agricultural cooperatives, and farms belonging to other legal entities and entrepreneurs) in the period from 2002 to 2012 but only the analysis of their structure per land size groups in the year of the latest Census of Agriculture (2012).

Contrary to that, family farms used to be registered within the Census of Population, Households and Housings (1971, 1981, 1992, and 2002) based on a supplementary questionnaire for "households possessing individual farms". Hence, the demographic Censuses provided the data on the number of households possessing family (individual) farms and their main agricultural funds (individual and rented land, number of heads of cattle, poultry and beehives, number of tractors).

In addition to the Introduction and Conclusion, the present paper is divided into four topic based parts:

- Changes in the land size structure of family farms (2002-2012);
- Land size structure of farms belonging to legal entities and entrepreneurs, with a special analysis of characteristics of land size structure of agricultural enterprises, agricultural cooperatives and farms belonging to other legal entities and entrepreneurs (2012);
- Capacities of cattle breeding production and level of equipping with tractors at farms, and
- Agricultural producers associations.

The research methods were listed in Chapters containing structural indicators of certain forms of farms.

Sources of data for the year 2012 that are the subject of analysis in this paper are the initial results of the Census of Agriculture (2012) – as adjusted until July 16th, 2013, while the data and calculated indicators that were presented for the Republic of Serbia (RS) refer to the territories of two macro-regions – Central Serbia (CS) and Autonomous Province of Vojvodina (APV), for which the regional analysis was carried out.

In addition to data from the Census of Population, Households and Housings (2002) and Census of Agriculture (2012) we used other data and publications of the Statistical Office of the Republic of Serbia, Serbian Business Registers Agency (SBRA), chambers of commerce (CC), cooperative unions (CU) and reference bibliography.

1. CHANGES IN THE LAND SIZE STRUCTURE OF FAMILY FARMS

Family farms are traditionally exceptionally dominant in agriculture of Serbia. Their domination is evident in the years of both Censuses (2002 and 2012), in both the total number of all forms of farms and in the total size of agricultural land they use, but simultaneously with a significantly smaller average land size compared to other forms of farms (enterprises, cooperatives, and farms belonging to other legal entities and entrepreneurs).

Due to a difference in the definition of *individual farms* according to the Census of Population, Households and Housing from 2002 [4] and *family farms* according to the Census of Agriculture from 2012 [3], the data of two Censuses referred to above are not entirely comparable.

Namely, the Census of Population, Households and Housing from 2002 registered the households that own *individual farms* – which are defined as "any household, which at the time of the Census:

a) Used at least 10 a (1 a = 100 m^2) of arable land, as well as
b) Households using less than 10 a of arable land but possessing at least: one cow and a calf, or one cow and one bullcalf, or one cow and two grown head of small cattle, or five grown sheep, or three grown pigs, or four grown heads of sheep and pig together, or fifty grown poultry, or twenty beehives". [4: 15]

However, the Census of Agriculture from 2012 defined the *family farm* as "any family or other community of persons who live together and spend their income together on satisfying the basic necessities for living (including a single-member households), whose members (one or more) are involved in agricultural production, either as their primary or secondary activity, which has a unified management, uses the means for production (land, machinery, facilities) and labour of its members jointly, whose holder is a physical person, and which also:

a) Cultivates – uses 50 a and more of agricultural land where they perform agricultural production irrespective if such production is designated to the market or not; or

b) Cultivates – uses less than 50 a of agricultural land but performs intensive field, fruit growing, grape growing, and vegetable production and flower production (including production in greenhouses and heated lanes), mushroom production and cattle breeding production, namely performs agricultural production that is designated to the market; or

c) Grows at least: two heads of cattle, or one head of cattle and two heads of small cattle (pig, goat, sheep - together), or five sheep and five goats, or three pigs, or four heads of small cattle (pigs, goats, sheep – together), or fifty small poultry, or twenty bee communities." [3:18]

Despite the above-mentioned differences in definition of individual, namely family farms according to Censuses from 2002 and 2012, as well as with respect of the size and category of use of land (10 a of utilised arable land, namely 50 a of utilised agricultural land) and according to characteristics of agricultural activities and number of household members who perform them (primary and secondary activity of one or more household members) and purpose of production (for their own needs and with the land size exceeding 50 a of utilised agricultural land), the essential difference in the size of utilised land has been practically eliminated with fully equalized number of heads of certain cattle breeds, poultry and beehives that are grown at farms of households with cattle, poultry and bees.

Some aspects of methodological issues relating to *households that own farm and individual farms (IF)* in agriculture of Serbia, which were analysed based on the Census of Population, Households, and Housing

(2002), have been considered more comprehensively in other papers elaborated by the author of this paper [5, 6, 7].

Furthermore, structural changes of family farms in Serbia in the period that ended with the Census of Population, Households, and Housing in 2002, were analysed in individual and co-signed papers elaborated by the author of this paper [8, 9, 10] and papers of other authors [11, 12, 13, 14].

Finally, due to a relatively short time that has elapsed from the publishing of the initial/preliminary results of the Census of Agriculture from 2012 [2], the analysis of land size structure of family farms in Serbia (and agricultural cooperatives) based on the data contained in that Census is available in only one paper elaborated by the author of this paper [15].

Considering all the above, we can conclude that certain comparability of data for the analysis and interpretation of calculated indicators for the family (individual) farms was provided based on the Census of Population, Households, and Housing from 2002 and Census of Agriculture from 2012.

The land size structure of family farms is characterised by numerous and very important changes that have occurred within the last decade of transition changes in Serbia. The main characteristic of these changes is the continuation and acceleration of the trend of decrease in their total number (by 150,580 farms or by 19.8%), which means that every fifth FF in Serbia were ”extinguished” within the last decade of transition changes. In all that, the dynamics of reduction in the number of FF was significantly faster than the reduction in their overall utilised land size (by 50,455 ha, or by only 1.8%) (Table 2). This indicates that processes of increase of the average land/estate size[5] are also present in this group of farms from 3.68 to 4.49 ha, namely by 0.81 ha or 21.8% although with mutually contrary trends per macro-regions: reduction of the land size in Central Serbia (from 3.70 ha to 3.41 ha, namely by 0.29 ha or 7.8%) and, in parallel, significant increase in the land size in the Autonomous Province of Vojvodina (from 3.65 to 8.04 ha, namely by 4.39 ha or 2.2 times).

[5] *Average land size* is calculated as the indicator of the ratio between the utilized surface of overall (2002), namely utilized agricultural land (2012) and the number of “farms with land”, i.e. excluding the “landless” farms” – which do not use land but only breed the minimum prescribed number of heads of cattle (certain species or their combinations), poultry and beehives.

	Family farms (FF) according to the size of utilised land						Total
	Landless	< 2 ha	2-5 ha	5-10 ha	10-20 ha	> 20 ha	
Republic of Serbia (2002)							
Number of FF	6 288	354 029	244 064	131 438	36 772	6300	778 891
Structure (%)	0.8	45.5	31.3	16.9	4.7	0.8	100.0
Land (ha)	0	347 252	854 366	957 719	503 358	206 305	2 869 000
Structure (%)	0.0	12.1	29.8	33.4	17.5	7.2	100.0
Central Serbia							
Number of FF	2 828	248 150	197 273	100 935	25 038	3 192	577 416
Structure (%)	0.7	46.7	32.4	14.7	4.4	1.0	100.0
Share of CS (RS=100)	45.0	70.1	80.8	76.8	68.1	50.7	74.1
Land (ha)	0	258 563	699 739	736 384	344 788	95 130	2 134 604
Structure (%)	0.0	12.1	32.8	34.5	16.2	4.5	100.0
Share of CS (RS=100)	0,0	74.5	81.9	76.9	68.5	46.1	74.4
Autonomous Province of Vojvodina							
Number of FF	3460	105 879	46 791	30 503	11 734	3 108	201475
Structure (%)	1.7	52.6	23.2	15.1	5.8	1.5	100.0
Share of APV (RS=100)	55.0	29.9	19.2	23.2	31.9	49.3	25.9
Land (ha)	0	88 689	154 627	221 335	158 570	111 175	734 396
Structure (%)	0.0	12.1	21.1	30.1	21.6	15.1	100.0
Share of APV (RS=100)	0,0	25.5	18.1	23.1	31.5	53.9	25.6
Republic of Serbia (2012)							
Number of FF	9 415	297 715	182 109	88 631	32 056	18 385	628 311
Structure (%)	1.5	47.4	29.0	14.1	5.1	2.9	100.0
Land (ha)	0	273 188	594 713	614 044	431 937	904 663	2 818 545
Structure (%)	0.0	9.7	21.1	21.8	15.3	32.1	100.0
Central Serbia							
Number of FF	3547	229 276	153 935	69 796	20 614	4 876	482 044
Structure (%)	0.7	47.6	31.9	14.5	4.3	1.0	100.0
Share of CS (RS=100)	37.7	77.0	84.5	78.7	64.3	26.5	76.7
Land (ha)	0	224 967	502 332	480 189	272 448	163 269	1 643 205
Structure (%)	0.0	13.7	30.6	29.2	16.6	9.9	100.0
Share of CS (RS=100)	-	82.3	84.5	78.2	63.1	18.0	58.3
Autonomous Province of Vojvodina							
Number of FF	5868	68 439	28 174	18 835	11 442	13 509	146 267
Structure (%)	4.0	46.8	19.3	12.9	7.8	9.2	100.0
Share of APV (RS=100)	62.3	23.0	15.5	21.3	35.7	73.5	23.3
Land (ha)	0	48 221	92 382	133 855	159 489	741 393	1 175 340
Structure (%)	0.0	4.1	7.9	11.4	13.6	63.1	100.0
Share of APV (RS=100)	-	17.7	15.5	21.8	36.9	82.0	41.7

Table 2. Land size structure of family farms in Serbia, per macro-regions, in 2002 and 2012

Source: Author's calculation based on the data from Censuses conducted in 2002 [4] and 2012 [2][6].

[6] The initial/preliminary results of the Census of Agriculture from 2012, adjusted until July 16th, 2013.

The reduction in the number of family farms is typical for all land size groups of the analysed farms and for all three regions that were studied (Republic of Serbia, Central Serbia, and Autonomous Province of Vojvodina) with a diverse intensity – except for two antipodes: "landless" farms – their number has increased by 49.7%, and in particular the farms with a land size of over 20 ha – their number has increased by almost three times (index of 291.8%). This indicates that the group of family farms in Serbia (2002-2012) is experiencing intensive processes of differentiation to:

- Landless and small farmers with the land size of up to 2 ha – their share in the total number of FF has increased from 46.3% to 48.9% with simultaneous reduction in their share from 12.1% to 9.7% in the overall utilised land size, on the one hand; and
- Large market oriented farms with a land size exceeding 20 ha – their share in the total number of FF has increased from 0.8% to 2.9% with a simultaneous very fast increase of their share from 7.2% to even 32.1% in the overall utilised land size, on the other hand.

Contrary to the Census from 2002, when all relatively larger individual farms were stated in the aggregate land size group marked as "farms with the land size exceeding 20 ha" due to a more widely spread phenomenon of emerging of larger farms within the last decade of the transition period, in particular in the territory of the Autonomous Province of Vojvodina, such land size group can be divided into six land size groups in the Census from 2012, including currently the largest land size group (1,000 – 2,500 ha) where four family farms are registered with the average land size of around 1,400 ha (Table 3).

Relatively small number (2.93%) of family farms with the land size exceeding 20 ha that organise their production at almost one third (32.1%) of overall utilised land size in Serbia (2012) is largely the result of synergy between two agrarian-political measures:

- Changes and amendments to the Law on Agricultural Land (2006) [16] that enabled family farms to rent public agricultural land of unlimited surface, and owners of cattle breeding farms to be given the priority in public land renting (1 ha of arable land per conditional head of cattle), on the one hand, and
- Enabling the family farms to obtain subsidies for 100 ha of plough land size, including the rented public land in addition to their own land – in the surface of up to 100 ha of plough land in total, on the other hand.

	Farms with > 20 ha according to the size of utilised land						Total >20 ha	Total
	20-50	50-100	100-300	300-500	500-1000	1000-2500		
Republic of Serbia								
Number of farms	12 833	4 245	1 201	74	28	4	18 385	628 311
Structure (%)	2.04	0.68	0.19	0.01	0.00	0.00	2.93	100.00
Land (ha)	383 212	303 119	167 552	28 233	17 161	5 386	904 663	2 818 545
Structure (%)	13.6	10.8	5.9	1.0	0.6	0.2	32.1	100.0
Central Serbia								
Number of farms	4 369	428	72	3	3	1	4 876	482 044
Structure (%)	0.91	0.09	0.01	0.00	0.00	0.00	1.01	100.00
Share of CS (RS=100)	34.0	10.1	6.0	4.1	10.7	25.0	26.5	76.7
Land (ha)	120 618	27 906	10 472	1 171	1 932	1 172	163 269	1 643 205
Structure (%)	7.3	1.7	0.6	0.1	0.1	0.1	9.9	100.0
Share of CS (RS=100)	31.5	9.2	6.3	4.1	11.3	21.8	18.0	58.3
Autonomous Province of Vojvodina								
Number of farms	8 464	3 871	1129	71	25	3	13 509	146 267
Structure (%)	5.79	2.65	0.77	0.05	0.02	0.00	9.24	100.00
Share of APV (RS=100)	66.0	91.2	94.0	95.9	89.3	75.0	73.5	23.3
Land (ha)	262 594	275 214	157 081	27 061	15 229	4 214	741 393	1 175 340
Structure (%)	22.3	23.4	13.4	2.3	1.3	0.4	63.1	100.0
Share of APV (RS=100)	68.5	90.8	93.8	95.8	88.7	78.2	82.0	41.7

Table 3. Land size structure of family farms with the land size exceeding 20 ha in Serbia, per macro-regions in 2012

The emerging of this group of "transition winners" has been made possible mainly to a part of large family farms in the territory of the Autonomous Province of Vojvodina where the dominant part of public agricultural land is to be found. Their production and economic strengthening has also been facilitated by the so-called "legal voids" in the Law on Agricultural Land and decrees on subsidies in plant production, which enabled several members of practically the same household to register a larger number of "their" farms (RF) and such a way multiply as a family the rented surfaces of public plough land and obtaining of annual subsidies from the agricultural budget based on that. Furthermore, there have been cases in practice, that "services" of economically deprived farmers in whose name the public plough land was rented fictionally (de *jure*) and subsidies paid from the budget for agriculture, in addition to a larger number of members of their households, and with appropriate financial or other fees (services of agricultural machinery without payment of the fee) were used for such "manipulations" in favour of *de facto* owners of large farms.

We point out the following facts related to the impact of the lobbing groups on creating of *ad hoc* measures of agricultural policy:

- In 2004, when a new concept of payment of subsidies per hectare and all other forms of incentives was hastily applied without the appropriate previous promotion among the farmers only for registered family farms (RFF), the actually highest agrarian budget amounting to 5% of the overall budget of Serbia was distributed to only 38,000 RFF, or 4.9% of the total number of RFF (according to the Census from 2002), more than 95% of which were from the territory of the Autonomous Province of Vojvodina;
- In the period from 2009 to 2011, when a "new" condition for utilisation of subsidies per hectare of plough land was set so that the owner, or "holder"[7] of a RFF has to hold a pension-disability insurance as agricultural producer (which was unprofitable for farms with up to 5 ha of plough land), there were only around 75 thousand of RFF with the right to this type of subsidy (less than 10% of the total number of family farms according to the Census from 2002), while even 76% of subsidies that were paid in total on such basis were allocated to RFF in the territory of the Autonomous Province of Vojvodina – where around 40% of the overall arable land owned by RFF in Serbia can be found.[8]

Based on post-socialist "primary accumulation of capital" in agriculture of Serbia that has been carried out in such a way, without reducing even to a lesser extent the purchase of land by foreign economically stronger farms and contribution of restitution of land to the heirs of physical persons it had been taken away from after the World War II [17], that has not been completed yet, as well as other entrepreneurial capacities of owners of larger farms, more than 18 thousand family farms were created in Serbia during the last decade (mainly in the Autonomous Province of Vojvodina) that will be able to become relatively competitive to highly subsidised farms in the European Union in the period of our forthcoming integration into the EU-28.

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[7] The person in whose name the family farm is registered – in the case when the owner of such RFF works outside the farm or is retired.

[8] Author's calculation based on documentation of the Department for Payments in Agriculture of the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia.

Considering the presented changes in the land size structure of family farms in Serbia (2002-2012) and the dominant majority of smaller (up to 2 ha and 2-5 ha) and (for our conditions) medium farms (5-10 ha), their sustainability in the future depends highly on:

- Changes in production structure in favour of fruit, grape, and vegetable production where it is possible to achieve higher value and profit in production per hectare and/or conversion of production from conventional into organic agriculture;
- Development of programmes from complementary activities "around agriculture" aimed at diversification of sources of their revenues (household activities, rural tourism, etc.); [18]
- Providing of services of agricultural consultancy service and founding of production on knowledge based economy, [19] and
- Their merging into cooperatives and other forms of cooperation aiming at utilisation of organisational and economic advantages, namely enhancing of competitiveness through reduction of costs in procurement of production material, joint utilisation of agricultural machinery and joint placing of their market surpluses – with eliminating or bringing numerous intermediaries to the minimum in production processes, from procurement of inputs, via production (in the field, orchard, vineyard, and stable) and processing, up to placing of agricultural-food products to consumers. [15]

2. LAND SIZE STRUCTURE OF FARMS BELONGING TO LEGAL ENTITIES AND ENTREPRENEURS

According to the Census of Agriculture from 2012 there are 3,507 entities in total in the group of farms belonging to legal entities and entrepreneurs (Table 4). This group consists of 13 individually systematised legal forms of farms among which only two sub-groups of farms used to be analysed in accordance with the previous approach to study of land size structure of this group of farms:

- *Agricultural enterprises (AE), and*
- *Agricultural cooperatives (AC).*

Farms	All farms		"Landless" farms			Utilised land size		
	Number	%	Number	%	Share	ha	%	ha/farm
Total	631 818	100.0	10 621	100.0	1.7	3 430 755	100.0	5.52
∑LEandE	3 507	0.56	1 206	11.4	34.4	612 211	17.8	266.06
Farms belonging to legal entities and entrepreneurs								
AE	1 358	0.21	331	3.12	24.4	344 041	10.0	335.00
AC	421	0.07	144	1.36	34.2	47 231	1.4	170.51
OLEandE	1 728	0.27	731	6.88	42.3	220 939	6.4	221.60

Table 4. Main indicators for farms belonging to legal entities and entrepreneurs in Serbia (2012).

However, considering that the sub-group of *other farms belonging to legal entities and entrepreneurs* (OLEandE) - which includes: a) the "entrepreneurs" – individuals (physical persons) registered for the acquisition of agricultural income, and b) other forms of "legal entities" engaged in agricultural activities as their primary or supplementary activities, [3: 43-44] - makes a significant sub-group according the number of farms (0.27% of all forms of registered farms, or nearly identical to the aggregate number of AE and AC) and the area of utilised land (6.4% of total utilised land of all forms of registered farms, or 5.5 times higher than in AC or 2/3 of that of AE), as well as that the average size of their land is relatively large (221.60 ha), for the first time in our agro-economic bibliography we have shown their land size structure according to the Census of Agriculture from 2012.

2.1. Land size structure of agricultural enterprises

Due to the temporal distance of half a century since the last (complete) Census of Agriculture conducted in 1960, and Census of Agriculture (conducted based on a sample) conducted in 1969, as well as numerous institutional and organisational changes in the sector of legal entities in agriculture of Serbia during that period, it is not objectively possible to analyse changes of this type of land size structure of this form of farms in the period 2002-2012.

Therefore, in this paper we analyze only the characteristics of a land size structure of agricultural enterprises in Serbia based on the data from the Census of Agriculture from 2012 per macro-regions (Central Serbia and

Autonomous Province of Vojvodina), which has been analogously applied in the following thematic areas related to the land size structure of agricultural cooperatives and farms belonging to other legal entities and entrepreneurs.

The sub-group of *agricultural enterprises*, based on the methodological instructions for the Census of Agriculture from 2012 [3], consists of five legal forms of organising in agriculture in Serbia:

- *Partnership* - "a company of two or more partners who are jointly and severally liable for the company's obligations with their entire assets, without limitations";
- *Limited Partnership* - "a company that has at least two members, of which at least one shall bear unlimited solidary liability (general partner), and at least one shall bear a limited liability to the amount of the unpaid, or non-deposited share (limited partner)";
- *Limited liability company* - "a company in which one or more members have stakes in the share capital of the company, but the members are not liable for the obligations of the company, except in certain cases defined by the applicable Company's Law [20]";
- *Joint stock company* - "a company whose share capital is divided into shares, owned by one or more shareholders who are not liable for the company's obligations, unless in cases defined by the applicable Company's Law. Joint stock company is liable for its obligations with its entire assets," and
- *Public company* - "a company that performs activities of general interest, established by the state or local self-government unit, or autonomous province." [3: 44]

During the last decade, agricultural enterprises have undergone numerous and significant changes typical for post-socialist transition, the focus of which was the transformation of *social property* – a specific form of property typical only for the SFR Yugoslavia (until 1991), namely FR Yugoslavia (1992-2006).

The process of transformation of social property in all forms of farms with different legal forms was based on two laws: Law on Conditions and Procedures of Transformation of Social Property into Other Forms of

Property [21] – which referred to all legal entities in all industries and fields, and the Law on Transformation of Social property at Agricultural Land into Other Forms of Property [22] – which referred practically to all forms of farms with the status of legal entities. Both laws are striking examples of enforcement of *lex specialis* – since they were enacted at the time when according to Constitutions, as highest legal documents of former states of SFR Yugoslavia and FR Yugoslavia, social property was guaranteed as constitutional category – all until its elimination as a form of property in the Constitution of the Republic of Serbia (2006).

However, although it was *de jure* left out of the Constitution of the Republic of Serbia (2006), social property has remained *de facto* as post-socialist recidivism in the property structure of numerous legal entities that have not completed their property transformation of that form of property until today, as it is the case with agricultural enterprises that are still undergoing the re-privatisation process – after the termination of unfulfilled contracts on first unsuccessful privatisation and returning of such legal entities into the portfolio of the Agency for Privatisation of the Republic of Serbia. According to the data of the Agency for Privatisation at the end of 2011 there were 27 agricultural enterprises in Serbia that were in the process of restructuring with 5,312 employees. During that year they recorded the loss amounting to 1,591,260,000 RSD (around 15.2 million Euros – according to the medium exchange rate of the National Bank of Serbia as of December 31st, 2011). [23]

We should point out in particular that the above-mentioned laws enabled the transformation of social property "into other forms of property" – which implied, in addition to private, both co-operative and public property although in practice their implementation could be brought down exclusively to privatisation of majority of entities in agribusiness of Serbia and re-privatisation of some agricultural companies with unsuccessful first privatisation.

During the privatisation procedure, the largest number of agricultural enterprises was privatised in a "package" as one economic entity and with the entire available assets, but there were also examples of the division of assets of certain agricultural enterprises in parts for which there were interested buyers - as is the case with the sale of agricultural land of a group of agricultural enterprises in re-privatisation (the so-called "Green Pool") to agribusiness company from the United Arab Emirates on the basis of the signed inter-state agreement (2013).

Also, parts of some agricultural enterprises have been the subject of a new cycle of sale between the first privatisation owners, namely legitimate "transition speculators" and the subsequent buyers of these assets, which is not the subject to further analysis in this paper.

According to the number of farms, utilised agricultural land size and production-economic potential, agricultural enterprises are the most important form of farms in the group of farms of all forms of legal entities and entrepreneurs in Serbia, and the analysis of their land size structure (2012) suggests the following conclusions:

- Out of the total of 1,358 agricultural enterprises that dispose with 344,041 ha of utilised agricultural land, the largest number of enterprises can be found in the territory of agriculturally developed Vojvodina (57.9%), with exceptionally dominant share (81.3%) in the overall size of utilised agricultural land of this group of farms;

- The share of agricultural “landless” enterprises is very large in Serbia (24.4%), with significantly higher presence of “landless” enterprises in Central Serbia (33.2%) than in the AP Vojvodina (17.9%);

- Excluding from the “landless” enterprises, the average land size of agricultural enterprises in Serbia is 335 ha, while regional differences also show significantly larger land size of enterprises in the AP Vojvodina (434 ha) than in Central Serbia (168 ha);

- The dominant share of agricultural enterprises with a small farm size (up to 50 ha), both in Serbia (47.9%) and in two the macro-regions - with some differences in terms of their lower share in the AP Vojvodina (43.3%) than in Central Serbia (54.4%);

- The enterprises with the land size exceeding 500 ha make 12.9% of the total number of enterprises in Serbia and they dispose with 87.6% of the total utilised agricultural land, with some differences in the macro-regions.

Without disputing the usual emphasis on the advantage of “economies of scale”, which is accomplished by larger agricultural enterprises and agribusiness companies, some authors tend to emphasise the significance of potential contribution of small and medium agricultural enterprises to the reduction of poverty and sustainable development of local communities in rural areas of Serbia. [24]

	Agricultural enterprises (AE) according to the size of utilised land (ha)													
	Without land	<2 ha	2-5	5-10	10-20	20-50	50-100	100-300	300-500	500-1000	1000-2500	2500-5000	>5000 ha	Total
Republic of Serbia (RS)														
Number of AE	331	232	126	98	88	107	74	98	35	55	82	28	4	1358
Structure (%)	24.4	17.1	9.3	7.2	6.5	7.9	5.4	7.2	2.6	4.1	6.0	2.1	0.3	100.0
Land, ha	0	212	428	757	1249	3457	5631	16 981	14010	39601	134276	102881	24558	344041
Structure (%)	0.0	0.1	0.1	0.2	0.4	1.0	1.6	4.9	4.1	11.5	39.0	29.9	7.1	100.0
Central Serbia (CS)														
Number of AE	190	121	70	40	40	40	21	17	8	5	12	7	1	572
Structure (%)	33.2	21.2	12.2	7.0	7.0	7.0	3.7	3.0	1.4	0.9	2.1	1.2	0.2	100.0
Share of CS (RS=100)	57.4	52.2	55.6	40.8	45.5	37.4	28.4	17.3	22.9	9.1	14.6	25.0	25.0	42.1
Land, ha	0	102	236	296	582	1343	1629	2822	3 086	3 911	21024	23 813	5396	64240
Structure (%)	0.0	0.2	0.4	0.5	0.9	2.1	2.5	4.4	4.8	6.1	32.7	37.1	8.4	100.0
Share of CS (RS=100)	-	48.1	55.1	39.1	46.6	38.8	28.9	16.6	22.0	9.9	15.7	23.1	22.0	18.7
Autonomous Province of Vojvodina (APV)														
Number of AE	141	111	56	58	48	67	53	81	27	50	70	21	3	786
Structure (%)	17.9	14.1	7.1	7.4	6.1	8.5	6.7	10.3	3.4	6.4	8.9	2.7	0.4	100.0
Share of APV (RS=100)	42.6	47.8	44.4	59.2	54.5	62.6	71.6	82.7	77.1	90.9	85.4	75.0	75.0	57.9
Land, ha	0	109	192	461	667	2115	4001	14160	10924	35690	113253	79067	19161	279800
Structure (%)	0.0	0.0	0.1	0.2	0.2	0.8	1.4	5.1	3.9	12.8	40.5	28.3	6.8	100.0
Share of APV (RS=100)	-	51.4	44.9	60.9	53.4	61.2	71.1	83.4	78.0	90.1	84.3	76.9	78.0	81.3

Table 5. Land size structure of agricultural enterprises in Serbia per macro-regions (2012)

2.2. Land size structure of agricultural cooperatives

According to Methodological instructions for the Census of Agriculture from 2012, *agricultural cooperatives* include the sub-group of economic entities that is defined as "a form of organising of physical persons (cooperative members) within which they fulfil their interests by acting on cooperative principles of voluntarity and solidarity, democracy, economic interest, equal management rights, independence, cooperative education and inter-cooperative co-operation." [3: 44]

Independently from the rich tradition – Central Union of Serbian Agricultural Cooperatives was one of 11 founders of the International Cooperative Association (London, 1895), agricultural cooperative organising in Serbia was not only under a "political bell" during the epoch of socialism but it was entirely ostracized from the reform processes during the post-socialist transition period.

This is also confirmed by the fact that the Law on Cooperatives from 1996, in addition to eight unsuccessful attempts of different proponents

of the draft of this law (from the Cooperative Union of Vojvodina to the competent Ministries of Economy) is still in force – except for Article 95 that refers to the return of cooperative assets that was taken over without any compensation in the period after July 1st, 1953. [25]

A special concern arises from the absence of political will to implement in Serbia the experience from the Republic of Slovenia that comes from the same political and economic environment as a former Yugoslav republic and that enacted the Law on Cooperatives (1992) immediately after their independence. According to this Law, Slovenia implemented *de jure* in practice its *lex specialis* and transformed all the assets that used to be the social property into cooperative property.

Long-term efforts of author of this paper at scientific meetings, in front of the General Meeting of the Cooperative Union of Serbia and in the public media to enact *lex specialis* [27] for *de jure* social and *de facto* cooperative property in agricultural cooperatives in Serbia and resolve the most important property "Gordian knot" in the cooperative sector of our economy, in particular agricultural, have been left without an echo among all competent Ministries of Economy and Agriculture in numerous coalition Governments of the Republic of Serbia during the transition period.

The analysis of the situation and proposals of measures for revival of agricultural cooperatives can be found in papers of cooperative supporters [28, 29], Monograph titled "Stavovi direktora zadruga i zadrugara o zemljoradničkom zadrugarstvu u Srbiji" ("Attitudes of directors of cooperatives and cooperative members on agricultural cooperatives in Serbia") [30], and in particular in the document titled "Strategija razvoja zemljoradničkog zadrugarstva u Republici Srbiji" ("Strategy of development of agricultural cooperatives in the Republic of Serbia") [31] – the elaboration of which, as well as the team consisting of 14 co-authors (six of them from abroad) were managed by the author of this paper and financed by the World Bank. In that context, it is necessary to point out two very important activities of the Board for Rural Communities of the Serbian Academy of Science and Art aimed at affirmation of agricultural cooperatives: free of charge dissemination of a popular publication titled "Zašto i kako se organizovati u zadruge" ("Why and how to organise into cooperatives") (with the circulation of 50,000 copies) [32] and in particular the organising of the Round Table on the topic titled "Cooperative – the factor of sustainable development of agricultural and rural communities in Serbia" – where examples of best practice in association of farmers into agricultural cooperatives in Serbia were pointed out. [33]

However, agricultural cooperatives in Serbia have undergone significant changes that are manifested through more and more striking devastation of cooperative property during the post-socialist transition, which culminated with the "property euthanasia" in the period of validity of the Law on Insolvency [34] (2010 – July 2012) – until passing of the Decision of the Constitutional Court of the Republic of Serbia on proclaiming certain provisions of that Law unconstitutional [35]. This meant the winding up of 736 cooperatives – to make this nonsense even larger, the remaining cooperative assets were made "state property" by being placed at the disposal of the Department for Property of the Republic of Serbia [15] upon the completion of (il)legal winding up procedures.

In such institutional and economic environment, only 421 cooperatives that fulfilled the methodological criteria to be registered as agricultural cooperatives were registered within the Census of Agriculture from 2012 out of 1,585 agricultural cooperatives that were registered according to the data of the Agency for Company's Registers from April, 2011. [31: 8]

Based on the analysis of the main characteristics of the land size structure of agricultural cooperatives the following conclusions can be formulated:

- Almost one third (34.2%) out of 421 cooperatives in Serbia in total are landless, while there are 80% of such cooperatives in the territory of Central Serbia;
- The landless cooperatives are followed by cooperatives with small (up to 2 ha) and cooperatives with relatively small (2 to 5 ha and 5 to 10 ha) land size, which makes 30.2% of their total number. They dispose with only 341 ha, or 0.8% out of the total of 47,231 ha of utilised agricultural land in agricultural cooperatives;
- Out of 47, or 11.1% of cooperatives with larger land size (more than 300 ha), which dispose with 80.6% of the total utilised agricultural land of this group of farms, all of them (except one) are in the territory of the AP Vojvodina;
- Only one cooperative with the land size of 2,160 ha manages 49.3% of overall utilised agricultural land in the cooperative sector of the Central Serbia, while, on the other hand, 17.1% of the total number of cooperatives manages approximately the same land size and they own from 10 to 300 ha of land each in the above-mentioned macro-region.

Based on the conclusions related to the land size structure of agricultural cooperatives stated above, it can be said that cooperatives in the Central Serbia can base their economic sustainability practically only on

providing intermediation services between the cooperative members and co-operators as buyers of production materials and sellers of market surpluses of agricultural produce, on the one side, and suppliers of production material and buyers of agricultural produce, on the other side.

Contrary to central Serbia around 50 cooperatives that dispose with around 35,000 ha of agricultural land in the territory of the AP Vojvodina have the potential of being relatively recognisable local and regional producers of agricultural produce, in addition to intermediating in the supply with production material and buy up of agricultural produce in the name and on behalf of cooperative members and co-operators.

In the end, we should emphasise in particular that, in addition to the examples of cooperative practice among the "old" complex cooperatives (AC "Beška" - Beška, AC "Tisa" - Bačko Petrovo Selo, ...), specialised cooperatives are particularly important for more successful development of the cooperative sector – among which we can single out the following as the examples of good cooperative practice: AC "Voćko" - Tavankut, AC "Slankamenka" - Slankamen, AC "Zelena bašta" - Saraorci, ...

	Agricultural cooperatives (AC) according to the size of utilised land (ha)											
	Without land	<2 ha	2-5	5-10	10-20	20-50	50-100	100-300	300-500	500-1000	1000-2500	Total
Republic of Serbia (RS) (2012)												
Number of AC	144	82	23	22	18	29	21	35	18	19	10	421
Structure (%)	34.2	19.5	5.5	5.2	4.3	6.9	5.0	8.3	4.3	4.4	2.4	100.0
Land, ha	0	80	81	180	266	958	1 580	6 022	7 304	13 374	17 386	47 231
Structure (%)	0.0	0.2	0.2	0.4	0.6	2.0	3.3	12.7	15.5	28.3	36.8	100.0
Central Serbia (CS)												
Number of AC	115	45	14	9	11	15	7	5	0	0	1	222
Structure (%)	51.8	20.3	6.3	4.1	4.9	6.8	3.2	2.2	0.0	0.0	0.4	100.0
Share of CS (RS=100)	79.9	54.9	60.9	40.9	61.1	51.7	33.3	14.3	0.0	0.0	10.0	52.7
Land, ha	0	40	49	82	161	501	515	878	0	0	2 160	4 386
Structure (%)	0.0	0.9	1.1	1.9	3.7	11.4	11.7	20.0	0.0	0.0	49.3	100.0
Share of CS (RS=100)	-	50.0	60.5	45.6	60.5	52.3	32.6	14.6	0.0	0.0	12.4	9.3
Autonomous Province of Vojvodina (APV)												
Number of AC	29	37	9	13	7	14	14	30	18	19	9	199
Structure (%)	14.6	18.6	4.5	6.5	3.5	7.0	7.0	15.1	9.2	9.5	4.5	100.0
Share of APV (RS=100)	20.1	45.1	39.1	59.1	38.9	48.3	66.7	85.7	100.0	100.0	90.0	47.3
Land, ha	0	40	31	98	104	458	1 065	5 144	7 304	13 374	15 226	42 844
Structure (%)	0.0	0.1	0.1	0.2	0.2	1.1	2.5	12.0	17.0	31.2	35.6	100.0
Share of APV (RS=100)	-	50.0	38.3	54.4	39.1	47.8	67.4	85.4	100.0	100.0	87.7	90.7

Table 6. Land size structure of agricultural cooperatives in Serbia per macro-regions (2012)

2.3. Land size structure of farms belonging to other legal entities and entrepreneurs

According to the Methodological Instructions for the Census of Agriculture from 2012 [3: 19-44], the group of *farms belonging to other legal entities* includes units of registration that utilised agricultural land and that are registered in the legal forms of:

- *Entrepreneur* (LPE) - " an individual who is capable of doing business in order to generate income and who is registered as such in accordance with the Law on the registration";
- *Business Association* - "legal entity set up by two companies or more companies or entrepreneurs in order to achieve common interests";
- *Institution* - "agricultural institute, veterinary institute, health facility (health centre, pharmacy, institute, clinical-hospital centre), social institution, preschool and school institution, institution of physical education, cultural institution (theatre, cultural centre, museum, library), etc.";
- *Public authority* - "Republic authority, authority of the autonomous province, county/district jail, correctional facility, etc.";
- *Local self-government unit* - "local authorities (municipalities), which are responsible for the shared land (shared meadows and pastures), which is neither rented nor allocated to another farm, but is covered by the right to the common grazing of cattle";
- *Other forms of organising* - "religious organisations", and
- *Nor classified elsewhere* - "everything that is not classified in any of the previous forms of association, e.g. civic association, bankruptcy estate, fund, etc.".

According to the indicators calculated and shown in Table 7, out of the total of 1,728 registered other legal entities and entrepreneurs in Serbia (2012), 731 legal entities or 42.3% are landless.

The remaining 997 farms, or 57.7% of the total number of other legal entities and entrepreneurs have used 220, 939 ha of agricultural land - of which 50.7% in the territory of Central Serbia and 49.3% in the AP Vojvodina. Among them, the largest sub-group is the one with smaller land size (up to 10 ha) - 687 farms, or 39.7% of their total number, which used 1,372 ha, or only 0.6% of the total land size of farms belonging to other legal entities and entrepreneurs.

Opposite to them is a sub-group of 85 farms with large land size (over 500 ha) - neglected in the previous agricultural-economic analysis, which owned 199,959 ha or 90.5% of the total utilised land of other legal entities and entrepreneurs. Among them there are eight legal entities that used a total of 79,823 ha (average of nearly 10,000 ha), accounting for one third of the total utilised land this type of farms.

Despite the fact that a significant portion of utilised land belonging to other legal entities and entrepreneurs consist of pastures managed by local self-government units (municipalities), this group of farms, namely beneficiaries should be attributed special attention in implementation of the future programme of agricultural land utilisation in the Republic of Serbia.

	Farms belonging to other legal entities and entrepreneurs (OLEandE) according to the size of utilised land (ha)													
	Without land	<2 ha	2-5	5-10	10-20	20-50	50-100	100-300	300-500	500-1000	1000-2500	2500-5000	>5000 ha	Total
Republic of Serbia (RS)														
Number of OLEandE	731	476	137	74	63	47	53	49	13	33	28	16	8	1728
Structure (%)	42.3	27.5	7.9	4.3	3.6	2.7	3.1	2.8	0.8	1.9	1.6	0.9	0.5	100.0
Land, ha	0	354	466	552	890	1 421	3 952	8 233	5 112	23 918	42 190	54 028	79 823	220 939
Structure (%)	0.0	0.2	0.2	0.2	0.4	0.6	1.8	3.7	2.3	10.8	19.1	24.5	36.1	100.0
Central Serbia (CS)														
Number of OLEandE	275	308	104	49	45	37	25	26	7	21	18	7	4	926
Structure (%)	29.7	33.3	11.2	5.3	4.9	4.0	2.7	2.8	0.8	2.3	1.9	0.8	0.4	100.0
Share of CS (RS=100)	37.6	64.7	75.9	66.2	71.4	78.7	47.2	53.1	53.8	63.6	64.3	43.8	50.0	53.6
Land, ha	0	247	353	359	644	1 123	1 821	4 490	2 889	14 761	28 079	20 641	36 653	112 060
Structure (%)	0.0	0.2	0.3	0.3	0.6	1.0	1.6	4.0	2.6	13.2	25.1	18.4	32.7	100.0
Share of CS (RS=100)	-	69.8	75.8	65.0	72.4	79.0	46.1	54.5	56.5	61.7	66.6	38.2	45.9	50.7
Autonomous Province of Vojvodina (APV)														
Number of OLEandE	456	168	33	25	18	10	28	23	6	12	10	9	4	802
Structure (%)	56.9	20.9	4.1	3.1	2.2	1.2	3.5	2.9	0.7	1.5	1.2	1.1	0.5	100.0
Share of APV (RS=100)	62.4	35.3	24.1	33.8	28.6	21.3	52.8	46.9	46.2	36.4	35.7	56.3	50.0	46.4
Land, ha	0	107	113	193	245	299	2 131	3 742	2 223	9 157	14 111	33 387	43 170	108 878
Structure (%)	0.0	0.1	0.1	0.2	0.2	0.3	2.0	3.4	2.0	8.4	13.0	30.7	39.6	100.0
Share of APV (RS=100)	-	30.2	24.2	35.0	27.5	21.0	53.9	45.5	43.5	38.3	33.4	61.8	54.1	49.3

Table 7. Land size structure of farms belonging to other legal entities and entrepreneurs in Serbia per macro-regions (2012)

Since the Law on Incentives in Agriculture and Rural Development (2013) [36] enabled all forms of farms to be registered, namely to obtain the status of RF and utilise subsidies and other incentives from the agricultural budget starting from 2013, based on the data that have been processed until now on registration of all forms of farms, the indicators of the share of certain RF per individual forms of farms in 2013 (Table 8) have been presented for the first time in our agro-economic bibliography.

Form of farm	All farms		Registered farms (RF)		
	Number	%	Number	%	Share
FF	628.311	99,4	466.976	99.67	74.3
AE	1.358	0.2	1.032	0.22	76.0
AC	421	0.1	214	0.05	50.8
OLEandE	1.728	0,3	296	0.06	17.1
Total	631.818	100,0	468.518	100.00	74.2

Table 8. The share of registered in the total number of certain forms of farms in Serbia (2013)

Source: Author's calculation based on the data from the Census of Agriculture from 2012 and data on registered farms of the Directorate for Agrarian Payments in 2013

Given the share of small, elderly, and other non-agricultural and other households that for various reasons have not registered their family farms, the share of 74.3% in the total number of registered FF can be considered satisfactory and a record number of this form of RF from the beginning of their registration (2004). Their registration is driven by the inclusion of all categories of agricultural land utilisation (up to 100 ha) into a system of subsidies, as well as the non-limiting the number of heads of cattle, poultry and beehives in the subsidy system.

Considering a relatively large share of "landless" farms in the group of agricultural enterprises (24.4%), the share of 76.0% registered in the overall number of agricultural enterprises can also be considered their highly satisfactory response – which has been particularly motivated by possibilities for this group of farms to obtain, for the first time, the subsidies not only with up to 100 ha of land but also for an unlimited number of animals – which is an exceptional advantage for the enterprises such as "Delta Agrar" – Belgrade with farms in Celarevo, Apatin, Stara Pazova, Banatska Topola, Banatsko Veliko Selo, Vladimirovci, and Zajecar; PC "Belgrade" – Padinska Skela, PIC "Becej" – Becej, BD "Agro" – Dobanovci, …

However, the fact that the share of registered agricultural cooperatives is relatively very small (50.8%) is the issue of high concern since it cannot be justified with inappropriate relationship of the state towards the resolving of property-legal and other issues of relevance for sustainable business activities of cooperatives.

The smallest share (17.1%) of registered farms belonging to other legal entities and entrepreneurs is expected since this group includes the largest number of "landless" legal entities (42.3%) and it is known after the dominant share of surfaces under pastures managed by local self-governments.

3. CAPACITIES OF ANIMAL PRODUCTION AND LEVEL OF EQUIPPING WITH TRACTORS AT FARMS

The trend of reduction of the share of animal husbandry in the value of agriculture in Serbia has reached the alarming level (below 30 percent), which is inadequate for the European countries and the structure of values of our agriculture in the period before and after the disintegration of the SFR Yugoslavia. [10: 27] This was particularly contributed by the destruction of important reproduction centres and numerous larger livestock farms in the privatised agricultural enterprises during the last decade of transition changes in agribusiness of Serbia.

The analysis of livestock production capacity indicators by types of farms in Serbia, which were calculated on the basis of available data from the Census of Agriculture from 2012 (Table 9), points to the following findings:

- Family farms have traditionally been dominant in the overall number of head of all livestock species (99.0% of sheep and goats, 91.7% of cattle, and 80.1% of pigs), poultry (62.6%) and beehive communities (98.3%);
- Agricultural enterprises occupy the second place, but with significantly lower share in all sectors of animal production - ranging from the highest of 32.7% of the total number of poultry (thanks to profitability of farms with the industrial way of organising of broilers and eggs production), to 18.7% of the total number of pigs and 7.8% of the total number of heads of cattle to relatively negligible share in the total number of goats (0.8%), sheep (0.7%) and beehive communities (0.4%), and

- The share of cooperatives and farms of other legal entities in the structure of total animal production capacities is relatively modest, with the exception of their share (4.5%) in the total number of poultry at farms belonging to other legal entities and entrepreneurs – because of poultry farms that were in the bankruptcy procedure at the time of the Census.

	Forms of farms				
	All	FF	AE	AC	OLEandE
Number of heads of cattle	907 592	831 823	70 868	3 352	1 549
Structure (all=100)	100.0	91.7	7.8	0.4	0.2
Cattle/farm	1.44	1.32	52.19	7.96	0.90
Cattle/hectare	0.26	0.30	0.21	0.07	0.01
Number of pigs	3 407 146	2 728 021	637 324	31 398	10 403
Structure (all=100)	100.0	80.1	18.7	0.9	0.3
Pigs/farm	5.39	4.34	469.31	74.58	6.02
Pigs/hectare	0.99	0.97	1.85	0.66	0.05
Number of sheep	1 735 169	1 718 027	12 547	834	3 761
Structure (all=100)	100.0	99.0	0.7	0.0	0.2
Sheep/farm	2.75	2.73	9.24	1.98	2.18
Sheep/hectare	0.51	0.61	0.04	0.02	0.02
Number of goats	231 754	229 333	1 856	20	545
Structure (all=100)	100.0	99.0	0.8	0.0	0.2
Goats/farm	0.37	0.36	1.37	0.05	0.32
Goats/hectare	0.07	0.08	0.01	0.00	0.00
Number of poultry	26 709 556	16 709 321	8 731 223	75 960	1 193 052
Structure (all=100)	100.0	62.6	32.7	0.3	4.5
Poultry/farm	42.27	26.59	6429.47	180.43	690.42
Poultry/hectare	7.79	5.93	25.38	1.61	5.40
Number of beehive communities (BC)	668 023	656 685	2 838	4 704	3 796
Structure (all=100)	100.0	98.3	0.4	0.7	0.6
BCs/farm	1.06	1.05	2.09	11.17	2.20
BCs/hectare	0.19	0.23	0.01	0.10	0.02
*Number of tractors**	410 868	404 717	4 489	869	793
Structure (all=100)	100.0	98.5	1.1	0.2	0.2
Tractors/farm	0.65	0.64	3.31	2.06	0.46
Tractors/100 hectares	11.98	14.36	1.30	1.84	0.36
Hectares/tractor	8.35	6.96	76.64	54.35	278.61

Table 9. Indicators of production capacities per forms of farms in agriculture of Serbia (2012)

BC – beehive community * - own two-axes tractor

Compared to other European countries, the number of heads of all breeds of cattle per hectare of utilised land in Serbia is exceptionally small and it indicates a more extensive way of organising of animal production and

inadequate utilisation of available land surfaces – excluding the number of family farms specialised in production of cow's milk based on contracts for delivery of milk to industrial dairy plants and young bulls and pigs fattening mainly without "firm" contractual relations with slaughtering facilities that is getting smaller every year, as well a small number of agricultural enterprises that have preserved animal farms even after their privatisation ("Delta Agrar" – in a larger number of pig and cattle farms all over Serbia: Čelarevo, Stara Pazova, Kikinda, Banatsko Veliko Selo i Zaječar; PK "Beograd" – Padinska Skela, PIK "Bečej" - Bečej, BD Agro - Dobanovci, PP "Sava Kovačević" - Vrbas, ...).

Despite the unfavourable age structure, the number of two-axes tractors is over dimensioned compared to the utilised land size at family farms (6.96 ha/tractor), which points to the need of their joining in procurement and shared use of tractors and other agricultural machinery. For that purpose it is necessary to revitalise the role of agricultural cooperatives in procurement of tractors and other pieces of agricultural machinery and their economically efficient exploitation based on a modified model of "machine rings" at smaller family farms of their cooperative members and co-operators. This would provide directly for the upgrading of cooperatives and indirectly of family farms as well [36], and improve their competitiveness in the conditions of the all-present globalisation of agricultural production and liberalisation of trade with agricultural-food products.

Such commitment is also confirmed by more favourable ratio between the number of tractors and utilised land size in all three forms of farms with the status of legal entities and entrepreneurs – the farms of which are larger and better regulated, which is the main assumption for much higher economic efficiency of their use compared to family farm (Table 8)

4. ASSOCIATIONS OF AGRICULTURAL PRODUCERS

Associations of agricultural producers in Serbia differ according to the forms of farms and they have been systematised in accordance with the structure of this paper into:

- Associations of farmers – owners of family farms;
- Associations of agricultural enterprises; and
- Cooperative alliances, as well as associations of agricultural cooperatives.

4.1. Associations of farmers – owners of family farms

Associations of farmers are the most important form of organisation of owners of family farms and other persons interested in the promotion of agricultural and rural development. [37, 38, 39]

History of associating aimed at promoting agriculture in Serbia dates back to the establishment of the *Society for Rural Economy* in Belgrade (1868) – the founder of various forms of the later transformations of the current *Association of Agricultural Engineers and Technicians of Serbia* (AAETS). [40]

According to the Agency for Company's Registers (APR), there are 20,779 associations in Serbia (as of July 17th, 2013), which were established or harmonised with the Law on Associations (2009). [41] However, the APR is not classifying them according to the objectives of their establishment or fields of their activities, which would enable the conducting of the analysis of their share in agriculture or according to certain search criteria. It should be noted that the Law allows the associations to register specific activities designated to revenue earning up to the level they need to achieve the objectives of their establishment. This has fostered the establishing of new and increase of the number of different associations.

The main problem of the analysis of significance of farmers' associations is the inability to determine their representativeness at the national level. Based on the information available to the author, it could be only emphasised that the criterion of national representation is met only by the *Union of Beekeeping Associations of Serbia* (FBAS) [42], which in its membership brings together an absolute majority of local associations of beekeepers and active bee farms, namely statistically more precise, 208 municipal and other beekeepers' associations that gather 8,717 registered bee farms.

In the absence of the valid criteria and databases for methodologically correct analysis, based on the current knowledge of the author about the activities of some societies and associations of farmers in Serbia, without going into the evaluation of their statistical representativeness at the national level, we should point out in particular the importance of two complex associations:

- Previously established *Farmers' Association* (FA) - Novi Sad (2008), which was transformed from the *Association of Farmers of Vojvodina*, [43] and which currently has the largest media and political impact on the creation of measures of agricultural and rural policy in Serbia in relation to all other associations, and
- Association that is already in the foundation stage and that brings together a relatively large number of farmers – *Assembly of Serbian Agro-Economy Producers* (ASAEP) - Kraljevo (2012). [44]

In addition to these two associations, there is a large number of regional complex (*Farmers of Banat* – Crepaja ...), or production-market recognisable associations of farmers (*Farmers' Club 100P Plus* – Novi Sad …), which have a relatively larger impact and agrarian-political significance in Serbia.

However, local associations are the most numerous:

- *Complex agricultural associations (*Agriculture Development Centre "AGROSS" - Braničevo, 2009; "Agro Perspektiva" – development and promotion of agriculture - Temerin, 2013; ...) or
- *Specialised associations of farmers* (Association of Vineyard Growers of Vrsac Wine Area "Gudurica" – Gudurica – Vršac, 2001; Association of Vineyard Growers, Wine Producers and Fruit Growers of Zupa– Aleksandrovac, 2002; Association of Vineyard Growers and Wine Producers "Oplenac" – Topola, 2005; Association of Simmental Breed Cattle "Šumadija" - Kragujevac, 2005; Association of Producers of Futog Cabbage and Futog Sour Cabbage "Futoški kupus" - Futog, 2007; Association of Cattle Breeders – Bogatić, 2009; Association of Vineyard Growers and Wine Producers "Pudar" - Sakule, 2010; Association of Sheep Breeders "Selo naše" - Vladičin Han, ...).

A special place belongs to associations for:

- *Promotion and development of the growing organic farming (Terra's - Subotica, 1990; Bioplaneta - Belgrade, 2008; Serbia Organica - Belgrade, 2009, Centre for Organic Agriculture - Uzice, 2013; ...;*
- *Promotion and development of activities "around agriculture" (Association "Rural Tourism of Serbia"* - Ljig, 2002; *Hunting Association "CIK"* - Bačko Petrovo Selo, 2010; *Innovation Centre for Promotion of Agriculture, Culture, Tourism and Networking* - Novi Sad, 2013; ...) and

- *Development of local communities or regions (Serbian Association for Rural Sociology and Sociology of Agriculture* - Belgrade, 1995; *Centre for Promotion of Agriculture and Rural Development "Agribusiness Centre"* - Kutlovo, 2002; *Association of Consultants in the Field of Agriculture, "Agrar-contact"* - Vračar-Belgrade 2006; *Association "I will marry the whole village"* - Gornji Matejevac – Nis, 2010; *Association for Agriculture, Rural Community and Information* - Novi Sad, 2010; *Association "Eco Village"* - Dudovica, 2010; *Association of Water Users "Markovici"* and *Association of Water Users "Bjelotići Polje "*- both in the village of Lunovo, and both founded in 2013; ...

Farmers' Association will have even greater importance and role in the future development of agriculture and rural areas, especially in the period of our accession to the EU.

4.2. Associations of agricultural enterprises

Chambers of commerce (CC) are the main form of business association of agricultural enterprises.

Chamber system in Serbia consists of the following: National Chamber of Commerce of Serbia, two provincial chambers (CC of Vojvodina and CC of Kosovo and Metohija) and 17 regional CC with registered offices in Subotica, Sombor, Kikinda, Novi Sad, Zrenjanin, Pancevo, Sremska Mitrovica, Belgrade, Pozarevac, Zajecar Kragujevac, Valjevo, Uzice, Kraljevo, Krusevac, Nis, and Leskovac. Their functioning is regulated by the Law on Chambers of Commerce (2009, 2011) [45] which, unlike previous mandatory membership of all businesses in chambers is currently based on the principle of voluntary association and membership of agricultural and other enterprises.

Two most important forms of internal organisation of the chamber system for chamber members are as follows - associations and groups. More specifically, for agricultural enterprises it is the *Association for Agriculture, Food and Tobacco Industry and Water Management*, composed of 20 sectoral groups, namely: 1) water management, 2) feed manufacturers, 3) food testing laboratories, 4) livestock production and processing of livestock products, and 5) slaughter industry - production, processing and preserving of meat and meat products; 6) dairy industry – milk producers and processing plants, 7) poultry meat and eggs producers, 8) beekeeping

and honey production; 9) fisheries, 10) producers and manufacturers of medicinal, aromatic and spice plants, 11) producers of ornamental plants and flowers, 12) organic production; 13) producers of cereals, milling and bakery products and pasta, 14) manufacturers of dietary foods and baby foods; 15) manufacturers of vegetable oils, 16) production, processing and sale of fruits, vegetables, berries and fruit seedlings, 17) viticulture and enology, 18) manufacturers of grapevine grafts and fruit trees; 19) producers of confectionery products, and 20) tobacco producers and processing plants. [46]

In addition to the Chambers of Commerce - that mandatory membership in the socialist socio-economic system "reputed" to be the *de facto* "para-state institutions" for implementation of the current policy, certain agricultural enterprises team up with each other or with other forms of agricultural farms and in other forms of associations such as:

- *Business communities*: Business community for fruits and vegetables - Belgrade, Business community for industrial plants - Novi Sad, Poultry Community - Belgrade, "ŽitoVojvodine" - Novi Sad, ...;
- *Clusters*: "Šumadija Flower" - Kragujevac, "Alco Cluster of southern Serbia" - Leskovac, Cluster "Fruit Land" - Subotica, Agriculture Cluster "Agro-South" – Nis, Cluster "Pannonian Spirits" Fruška Gora cluster of vineyard growers and wine producers "Alma Mons "- Sremski Karlovci, 2010; ..., [48, 49, 50]
- *Associations*: Association of primary agricultural producers "Vojvodina Agrar" - Becej [51], "Seed Industry Association of Serbia" - Novi Sad [52], ...

4.3. Cooperative alliances

Association of agricultural cooperatives in cooperative alliances at national and international level has historically long and rich tradition in Serbia, with occasional ups and downs of the cooperative organisation in our country and our (non) participation in the International Cooperative Union (ICU, 1895 - London, and Geneva) and Cooperative Union of Europe (Brussels).

Since the establishment of the first agricultural-credit cooperative (Vranovo, 1894), through the formation of the Central Serbian Union of Agricultural Cooperatives (CSUAC, Smederevo, 1895) and the participation of its

President, Professor. Mihail Avramovic with 11 national cooperative alliances in constituting of the International Cooperative Union (ICU, London, 1895), to the present activities in the cooperative sector and the cooperative movement, we are approaching the 120th anniversary of cooperatives in Serbia.

The changes that have accompanied agricultural cooperatives in the post-socialist transition period inevitably affected the organisation and operations of the cooperative alliances in Serbia. [52]

At the beginning of the transition period in Serbia two national alliances operated:

- Cooperative Union of Serbia (CUS) - founded by the two provincial alliances (Cooperative Alliance of Vojvodina - CAV - with regional cooperative alliances in Pancevo, and Sremska Mitrovica; and Cooperative Alliance of Kosovo and Metohija - CAKM) and ten regional and district cooperative alliances in Central Serbia – with registered offices in Belgrade, Pozarevac, Zajecar Negotin, Nis, Leskovac, Jagodina, Kraljevo, Uzice and Valjevo, and
- Cooperative Union of Yugoslavia (CUY) - which, after the disintegration of the Federal Republic of Yugoslavia (1992), constituted the Cooperative Union of Serbia and Cooperative Union of Montenegro (CUS and CUMG).

First, due to bombardment by NATO (1999), the head office of the Cooperative Alliance of Kosovo and Metohija moved to Zubin Potok, and its activities were largely confined to a relatively small number of cooperatives in the municipalities of Zubin Potok, Kosovska Mitrovica, Leposavic and Zvecan.

After that, the Cooperative Union of Yugoslavia practically ceased to function due to withdrawal of representatives of the Cooperative Alliance of Serbia (2004) and employees of the CAY continued maintaining membership in the CCU and live on the resources earned by renting the business premises in the registered office of the CUY in Belgrade. The same has been later revitalised through the establishment of the Convention of the CUY consisting of representatives of cooperative alliances in currently two independent countries (Serbia and Montenegro) and election of the Managing Board and the President of the CUY (2012) without public profiling whether it is the matter of ‘international” or “co-ordinating”

cooperative union of two countries and without recognisability of its role and activities in the cooperative sector and cooperative movement in Serbia.

Despite the collision with Article 54 of the Rules of the Cooperative Union of Serbia (which is also limiting and opposite to the international cooperative principle on freedom of association) and without the approval of the CUS [54], two cooperative alliances have been established:

- Cooperative Association "Agrojaeren" in Gospodjinci (2009) [55], which was established with the support from the Norwegian Foundation Jaeren Produktutvikling by eight agricultural cooperatives (AC "Gospodjinci" – Gospodjinci, AC "Brazda" – Rusko Selo, AC "Srbobran" – Srbobran, AC "Zadrugar" – Bac, AC "Resnik" - Resnik, AC "Agro-Raca" - Raca, AC "Zadrugar" - Gornje Jarušice, and AC "Sebečevo" - Sebečevo) was aimed at promotion of the business model of association of the above-mentioned cooperatives and their cooperative enterprise "Samvirke" Ltd. based in Kragujevac, and
- Cooperative Association of Pirot, Dimitrovgrad, Bela Palanka Babušnica - Pirot (2013) [56], which was established by 12 cooperatives (AC "Arbinje Pirot" – Dojkinci, Craft cooperative carpets and souvenirs manufacture "Lady's Heart" - Pirot, AC "Class" - Pirot, AC "Bobolovac"- Blato, AC "Prelesje"- Dimirovgrad, AC "Nova mala"- Pirot, AC "Temac"- Pirot – Temska, AC "Barje"- Barje Čiflik, AC "Topli Do" – Topli Do, AC "Krupac" – Krupac, and AC "Poljska Ržana" - Poljska Ržana).

Contrary to that, despite the existence of the Cooperative Association of Belgrade, which is the founder of the Cooperative Union of Serbia and which was subsequently registered in the APR (2013) - because of inconsistencies in mutual communication, the CUS has approved the establishing of another "parallel" Municipal Co-operative Alliance of Agricultural Cooperatives of Belgrade in Belgrade - Borca (2012), which was founded by three cooperatives (AC "Zemljoradnik" - Borca, AC "Buducnost" - Dobanovci, and AC "Avala" - Beli Potok). [57]

Furthermore, during the transition period, independently from the approval of the CUS and outside the CUV several branch cooperative associations were established, including seven in the 2005: Cooperative Alliance "Fruit Land - the land of fruits" - Subotica (wound up in 2013.), Cooperative Alliance of Livestock and Agricultural Cooperatives "Banmlek" - Kikinda, Livestock and Agricultural Cooperatives Alliance "Federacija stocara

Banata" - Vrsac, Union of Agricultural and Mushroom Growing Cooperatives "Pecurka" – Veliko Srediste, Cooperative Union of Agricultural and Beekeeping Cooperatives "Vojvodjanska pcela" - Veternik, Union of Vegetable Growing and Agricultural Cooperatives "Zeleno Polje" – Gospodjinci, and Union of Vegetable Growing and Agricultural Cooperatives "Povrtarska Unija" - Begeč) and Union of Agricultural and Livestock Cooperatives "Uzgajivaci svinja" - Tomaševac in 2006. [58] However, the results of their activities are not yet recognised in the cooperative sector of the AP Vojvodina and Serbia.

Finally, the winding up of two regional cooperative associations in the areas with favourable conditions for agricultural production: District Co-operative Alliance of Srem in Sremska Mitrovica (2011) - which was the founder and a member of the Cooperative Union of Vojvodina, and the Cooperative Union of Sumadija and Pomoravlje County ("symbolically" on January 12th, 2012 on the day of the celebration of the International Year of Cooperatives) - which was the founder and a member of the Cooperative Union of Serbia, but later (May 28th, 2012) re-registered under a "new" name - Cooperative Union of Šumadija and Morava Basin in Jagodina.

The main problems in the functioning of the cooperative associations/ alliances include: the lack of cooperative statistics on cooperatives - members and based on that of an objective assessment of the representativeness of each alliance; absence or irregular payment of membership fees of cooperative necessary for functioning of the alliances; loss of conditions for functioning of CUY, CUS, and CUV as auditing cooperative unions and the absence or extreme irregularity of cooperative auditing in cooperatives and in particular in cooperative unions; majority representation of directors of cooperatives and non-cooperative representatives in the cooperative unions; the tendency of centralisation activities of the CUS and CUV and acting based on "top-down" approach rather than in accordance with the international cooperative principles and on the "bottom up" principle - from cooperatives through district, namely regional and provincial to the CUS; the absence of a common national cooperative association as the association of all professional and territorial cooperative alliances and exercising of unity of cooperative organisation at the national level; functioning of cooperative unions as "quasi-state" and "political" institutions rather than as business association of cooperatives and cooperative enterprises; exclusion of the CUS from the activities of the ICU and Cooperative Union of Europe; absence of activities of international cooperative unions in the programmes of activities of the CU of Serbia; ...

Based on the above, it can be concluded that cooperative unions are going to be faced with significant restructuring in accordance with more intensive inter-cooperative co-operation with the International Cooperative Union and in particular the Cooperative Union of Europe. At the same time, we need to continue and expand all forms of co-operation with the newly established states in the territory of former SFR Yugoslavia and the neighbouring region (Hungary, Romania) - which is particularly developed by the Cooperative Union of Vojvodina. Otherwise, the trend of rapid establishment of a greater number of "local" or "mini-branch" cooperative associations will continue and it will be very difficult to unify their individual activities into a unique general national cooperative movement.

CONCLUSIONS

In the dual structure of the total number f all forms of farms (631,818) and overall utilised land surface (3,430,755 ha) in Serbia, according to the initial results of the Census of Agriculture from 2012 that have been adjusted until now, family farms are traditionally dominant (99.4% of farms and 82.2% of land) with a very small average land size (4.55 ha), on the one hand, and agricultural enterprises (0.2% of farms and 10.0% of land) with the largest land size (335 ha), agricultural cooperatives (0.1% of farms and 1.4% of land) with a relatively larger land size (171 ha) and farms of other legal entities and entrepreneurs (0.3% of farms and 6.4% of land) with larger land size (222 ha), on the other hand.

Changes in the land size structure of family farms (2002-2012) indicate that accelerated tendency of reduction in their overall number has continued – the “extinguishing” of almost every fifth farm during the last decade of transition changes, with simultaneous mutually opposite trends of changes in the utilised land surface per macro-regions: reduction in the Central Serbia (by 491,399 ha or by 23%) and emphasised increase in the AP Vojvodina (by 440,944 ha or 60%). This has conditioned mutually opposite tendencies in changes of their average size of utilised agricultural land per macro-regions: reduction in the Central Serbia (from 3.72 to 3.43 ha or by 7.6%) and simultaneous significant increase in the AP Vojvodina (from 3.71 to 8.37 ha or by even 2.26 times). We should point out particularly that “landless” farms and those “with the land size of up to 2 ha” have increased their share in the overall number of FF (from 46.3% to 48.9%), but with the simultaneous reduction in their share from 12.1% to 9.7% in the overall utilised land size – which points

to accelerated processes of their impoverishing. Contrary to that, the farms "with 20 and more ha" have increased their share from 6,300, or 0.8% to 18,835, or 2.9% of the overall number of FF, and particularly the share in their overall utilised land size in Serbia (from 206,305 ha, or 7.2% to 904,663 ha, or 32.1%), with emphasised regional differences, in particular in the AP Vojvodina – where this group makes 9.2% of farms and uses up to 63.1% of FF land. More detailed analysis of the FF group "with 20 and more ha" indicates that they can be classified into six land size sub-groups in 2012 – from the sub-group with "20 to 50 ha" to the sub-group with even "1,000 to 2,500 ha), where we can currently find four farms being larger than the land size of 97.6% of the overall number of agricultural cooperatives and 91.6% of the overall number of agricultural enterprises in Serbia according to the utilised land size.

In all three sub-forms of farms belonging to legal entities and entrepreneurs there is a relatively high share of "landless" farms, which is typical for 24.4% enterprises, 34.2% of cooperatives, and 42.3% of farms of other legal entities and entrepreneurs.

Agricultural enterprises is Serbia are characterised by (un)successful model of privatisation during which social property over this group of farms was transformed into private by implementing two laws in the form of *lex specialis*, significant dismissing of employees and liquidation of the cattle fund at their farms, with the advantage that the sales price of land was hundred times lower some ten years ago compared to the price by which the land of such quality and such level of land cultivation could be bought today – this could be characterised as the "largest speculation operation with the state's blessing" during the transition period in the sector of agriculture. We can still find 27 larger enterprises among them where re-privatisation process is in progress, after the unsuccessful initial privatisation conducted within the previous period of transition and devastation of their property.

The land size structure of agricultural enterprises in Serbia (2012), excluding the group of "landless" farms with the largest share (24.4%), is characterised by polarisation of 47.9% small enterprises in five land size groups (up to 50 ha), which use only 1.4% of their land surface, on the one side, and smaller number (12.4%) of enterprises with larger land sizes (from 500 to 5,000 ha), which use even 87.6% of agricultural land of all enterprises, on the other side. Looking at macro-regions, the average size of utilised agricultural land in the AP Vojvodina is 2.6 times

larger (434 ha) and significantly better cultivated compared to the Central Serbia (168 ha). In addition to more than 5,500 larger FF with the land size ranging from 50 to 2,500 ha, this group of AE is most important in technological-technical and production sense for sustainable competitiveness of agriculture of Serbia compared to highly subsidised farms in the EU-28 in the forthcoming full liberalisation of domestic/national market of agricultural-food products.

During the transition period, agricultural cooperatives have been left outside the reform processes and cooperative sector in agriculture was characterised by: absence of political will to find the final solution for the paradox of *de jure* "social" property that is *de facto* cooperative property and failure through eight attempts to pass a new law on cooperatives during the transition period; winding up of a significant number of cooperatives – 736 cooperatives were wound up pursuant to the Law on Insolvency (2009) despite the fact that Constructional Court of Serbia proclaimed some of its provisions unconstitutional (July, 2012); different forms of devastation of assets of "old" cooperatives, as well as turning of their assets that remained after bankruptcy procedures into public property and placing the same at the disposal of the Republic Directorate for Assets; establishing of new specialised cooperatives – primarily in fruit and vegetable growing; passing of the Strategy of Development of Cooperatives in Agriculture in the Republic of Serbia – which has remained a "dead letter on a paper" until now since there is no interest in its implementation either in the competent Ministries (of agriculture and economy) or in associations of cooperatives – starting from regional to Cooperative Union of Serbia; …

The land size structure of agricultural cooperatives in Serbia (2012), excluding again the group of "landless" cooperatives with the largest share, is characterised by polarisation of 46.4% cooperatives with small land size (up to 100 ha), which use only 6.7% of land, on the one side, and 6.8% of cooperatives with larger land size (from 500 to 2,500 ha), which use even 65.1% of land of all cooperatives, on the other side. Looking at macro-regions, except for only one cooperative in the Central Serbia with the land size of 2,160 ha, 14.0% of cooperatives with the land size exceeding 500 ha that utilise 66.8% of land of all cooperatives in the AP Vojvodina could offer agricultural produce with recognisable cooperative trademark to the local and regional markets. Compared to the average size of utilised land per cooperative in Serbia (171 ha), the differences per macro-regions are exceptionally high and they range from

41 ha/cooperative in the Central Serbia to 252 ha/cooperative in the AP Vojvodina. Considering that characteristics of the land size structure of cooperatives in Serbia, the majority of them are directed to primary cooperative activity when it comes to sustainable business – intermediation between their cooperative members and co-operators, on the one side, and suppliers of production material and means for work, or buyers of cooperative agricultural produce, on the other side.

Farms of other legal entities and entrepreneurs are also characterised by exceptionally high share of "landless" legal entities and polarisation of 49.2% of farms using only 3.5% of agricultural land, on the one side, and only 4.9% of farms with larger land size (from 500 to 5,000 ha), which use even 90.5% of the overall agricultural land of this group of farms on the other side. This group of farms deserves a special study once the Statistical Office of the Republic of Serbia publishes the final results of the Census of Agriculture from 2012, as well as a special programme of utilisation of their relatively significant size of agricultural land (220,939 ha).

The impossibility to compare the data on individual forms of farms with the status of "legal entities and entrepreneurs" provided by the Agency for Company's Registers, Statistical Office of the Republic of Serbia and Directorate for Agrarian Payments imposes the need for urgent harmonisation of their data bases and creating of unique classification for systematisation of different forms of legal entities and entrepreneurs, in particular those that do not belong to agricultural cooperatives and entrepreneurs.

Family farms are traditionally dominant in the structure of the overall number of heads of all breeds of cattle (99.0% of sheep and goats, 91.7% of cattle, and 80.1% of pigs), poultry (62.6%), and bee communities (98.3%). The second place is occupied by agricultural enterprises, with significantly smaller share in all branches of animal production – from 32.7% of the overall number of poultry, through 18.7% of the overall number of pigs and 7.8% of the overall number of heads of cattle, up to relatively negligible share in the overall number of goats (0.8%, sheep (0.7%) and bee communities (0.4%). Finally, the share of agricultural cooperatives and farms belonging to other legal entities in the structure of overall capacities of animal production is relatively modest. Compared to other European countries, the number of heads of all breeds of cattle per hectare of utilised land in Serbia is exceptionally small and it indicates a

more extensive method of organising of animal production and inadequate utilisation of available land surface in all forms of farms in Serbia.

Despite the unfavourable age structure, the number of two-axes tractors is over dimensioned compared to the utilised land size at family farms (6.96 ha/tractor), which points to the need of their joining in procurement and shared use of tractors and other agricultural machinery. More favourable ratio between the number of tractors and utilised land size that is found among cooperatives (54.4 ha/tractor) and enterprises (76.6 ha/tractor) – the holdings of which are larger and better regulated – is the assumption of their more economically efficient use compared to family farms.

Associations of citizens – which include the associations of agricultural producers as well – are very numerous and diverse, but the Agency for Company's Registers does not classify them according to the objectives of establishing and fields of activities they are dealing with. In addition to the Association of Beekeeping Organisations of Serbia, which has the legitimacy of representative national association, there are other associations with certain agrarian-political significance and impact although they are not representative ones at a national level (Association of Farmers – Novi Sad, Club 100 P Plus – Novi Sad, Farmers of Banat – Crepaja, Convention of Agribusiness Producers of Serbia – Kraljevo…). The largest number of complex or specialised associations that are directed towards the development of agriculture and rural areas are still of local or regional significance.

Agricultural enterprises are associating into chambers of economy/ commerce (hierarchically organised starting from regional, through provincial to Chamber of Economy of Serbia), namely their associations of agriculture with several sectoral groups, while agricultural cooperatives are associating in an analogue way into district, provincial and Cooperative Union of Serbia. The main characteristic of the chamber and cooperative system is their para-state status and relatively small (chambers) up to practically negligible agrarian-political impact (cooperative associations) on the competent government institutions. That is why certain agricultural enterprises are linking in other forms of associations (clusters, business associations, etc.), while cooperative link into cooperative associations that are not under the auspices of the Cooperative Union of Serbia (Agrojaeren – Gospodjinci, 2009; Zadružni savez Pirota, Dimitrovgrada, Bele Palanke i Babušnice – Pirot, 2013; ...).

Despite the above-mentioned changes in agriculture of Serbia during the transition period, it is evident that are agriculture and rural development are going to be faced with significant changes in the period of pre-accession negotiations of Serbia and harmonisation with the concept of the Common EU Agrarian (and Rural) Policy.

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DEVELOPMENT CHARACTERISTICS OF AGRICULTURAL SECTOR IN SERBIA

INTRODUCTION

The agricultural sector[9] has an important place in the economy of Serbia, because of its share in employment and the GDP share, as well as its contribution to foreign trade deficit reduction. Trend analyses in Serbian agrarian sector are given longer time horizons, in order to compare the pre-transition period with the period of transition. The relationship trends between agricultural and non-agricultural sectors are highly emphasized, as well as the relations in agribusiness between agricultural production and agro industry – food processing and tobacco industries. The development characteristics of Serbian agriculture are analyzed through production and export performances of the sector, in the period 2005-2011. The production performances are analyzed through the structure and dynamics of agricultural production and the level of its partial productivity – labour and land. The export performances are analyzed through the value of agricultural exports with regard to hired labour and land in agricultural production. All analyzes use the comparative approach with the EU countries and the countries of the Region – Albania, Bosnia and Herzegovina, Montenegro, Croatia and Macedonia.[10] There are four EU countries that are singled out – the two "old" and two "new" EU states, which are interesting to be compared with Serbia.[11]

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[9] In this paper, the agricultural sector includes agriculture and agro industry that consists of food production, beverage production, animal feed production and tobacco production and processing, according to the Classification of Economic Activitiesfrom 1977, or food and beverage production and tobacco processing according to CA 1996, and food production, beverage production and tobacco processing, according to CA 2010. For more details, see: [7].

[10] The countries of the Region are analyzed collectively and individually, but it should be noted that Serbia is not included in the outlook of the Region.

[11] Austria and France are the representatives of the "old" EU member states, where Austria is by area and population similar to Serbia, while France is an important agricultural country of the EU. The "new" EU member states and the former socialist countries compared to Serbia are Hungary, the neighboring country, which has relatively similar agro-ecological characteristics, and Poland, which did not have collectivized agriculture but had, as Serbia in the former Yugoslavia, agricultural production mainly based on individual farms.

1. LONG-TERM DEVELOPMENT TRENDS

In the long-term development context, Serbian economy has been, according to the level and pace of GDP growth, in the crisis from the mid-eighties. Namely, in the final decade of the twentieth century, the economy and the agricultural sector of Serbia develop under conditions of more or less closed economy, which suddenly turns the stagnant economic characteristics of the development process from the eighties into the retrograde development dynamics (Fig.1). Thus, after almost two and a half decades of continual and relatively high pace of economic growth in the sixties and seventies, there is the emphasized retardation pace of economic development in the 1980s, i.e. the reduced rate of GDP growth in the period 1982-89 is 0.5% in total and – 0.2% on a *per capita* basis. With the beginning of the active process of "breaking" of the former Yugoslavia and sanctions imposed shortly after to the newly formed Yugoslavia, i.e. Serbia, the stagnant development gets highly emphasized retrograde characteristics, the economy "functions" in the conditions of hyperinflation and economic system is adjusted to "forcibly selected" model of closed economy. The economic epilogue is a sudden and large-scale drop of gross domestic product, which is in 1993 reduced to 41% compared with 1989.

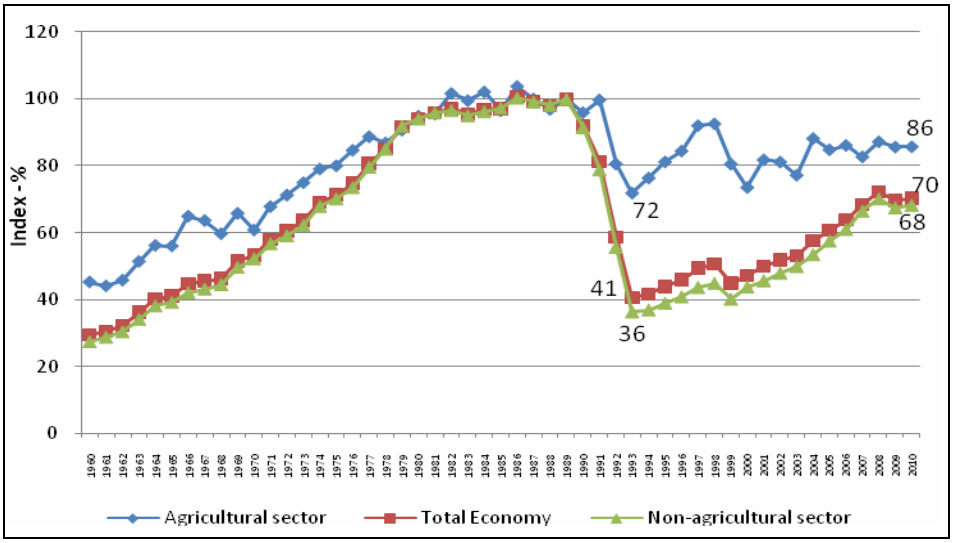

Figure 1: Dynamics of Gross Domestic Product in Serbia
(Note: Prices of 2002, and 1989 = 100)
Source: The authors' calculations on the basis of [7].

In only four years, the Serbian economic growth reverts thirty years. The economic activity of the non-agricultural sector is reduced to 36%, and the agricultural sector to 72%, compared with 1989. Within the agrarian sector, the agriculture has better growth performance than the agro industry; their levels of gross domestic product are reduced to 80% and 56% respectively, compared with 1989.[12] The process of economic recovery is, of course, much more gradual: five years after 1993, the gross domestic product grows at an average rate of 4.9% and in 1998 it reaches the level of 51%, compared with 1989. In 1999, the year of NATO "intervention" against Serbia and Yugoslavia, the scope of economic activity is again reduced to the level of 45%, compared with 1989. The transition period from 2000 to 2010, with a significant change of economic system and the initiation of the process of European integration, "brings" the GDP growth rate of 4.6%, with a growth rate of 5.3% in the non-agricultural and only 1.2% in the agricultural sector, with the volume of the gross domestic product of agriculture and agro industry scaled at a rate of 0.9% and 1.8% respectively.

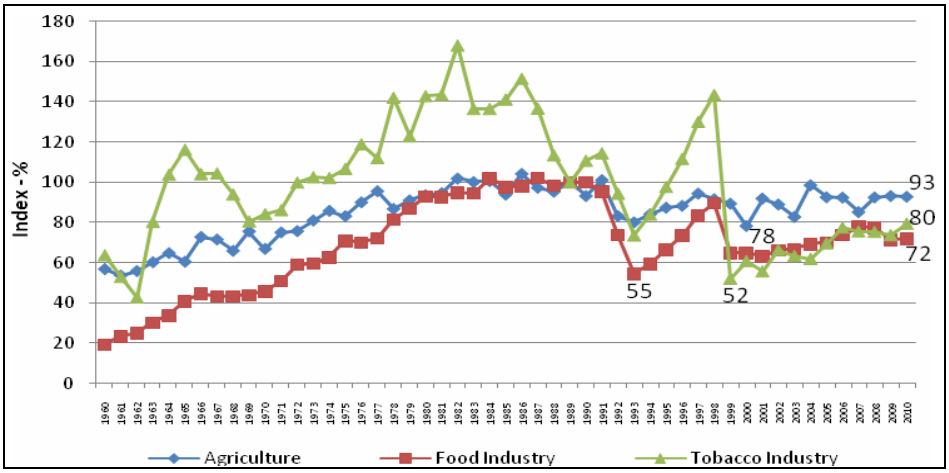

Figure 2: Dynamics of Gross Domestic Product in Serbian Agribusiness
Note: Prices of 2002, and 1989 = 100.
Source: The authors' calculations on the basis of [7].

[12] During the initial transition years, this development trend is stimulated by so-called factors of transition recession, which in some transition countries, ensue in the decrease of more than 50% of agricultural production. The trade relations are crucial, i.e. relative agricultural prices, whose disparity explains approximately 46% of the total and 52% of the explained decline in the agricultural production. The rise in agricultural input prices reduces their engagement, which determines approximately 82% of the total and about 92% of the explained decline in agricultural production. For more details, see: [5].

However, at the end of the last decade, more precisely from 2008 and the start of the global financial and economic crisis, the economic growth slows: in the period 2008-2010, the total gross domestic product decreases at a rate of 1.3%, with more emphasized reduction in the non-agricultural (1.4%) than in the agricultural sector (0.9%), therewith, there is the slight increase of 0.2% in agriculture and the decline of 3.2% in agro industry. Such growth performances in Serbian economy, agricultural and non-agricultural sectors in 2010 reach 70%, 68% and 86% respectively, compared with the gross domestic product in 1989, with the current level higher in agriculture (93%) than in agro industry – 80% and 72% (Fig. 2).

2. DEVELOPMENT CHARACTERISTICS OF AGRICULTURE

In Serbia, the slowdown in agricultural production begins back in the eighties, to reach the negative development trend[13] entering the transition period, at the end of the decade. In the following decade, i.e. during the nineties of the 20th century, there is the transition recession with the strong decline in agricultural production. This retardation of the development process of Serbian agriculture causes the increasing gap between the potential and the accomplished volume of agricultural production. Namely, during the nineties of the last century, the capacity utilization decreases in agricultural production, i.e. yields per unit area for crop production and per livestock unit for meat and dairy cattle production are reduced. The above-mentioned yields are significantly lower than in the developed countries of the EU, but also compared with the contemporary transition countries of Central and Eastern Europe. The trend of livestock reduction, both per livestock unit and per unit of land, together with the reduction in production per hectare of agricultural land is the inexplicable waste of primary potential of agricultural production, i.e. land in this period [3]. The agricultural production in Serbia does not achieve much better results in the period 2000-2005, and the

[13] Until the 1990s, the slowdown is caused by the bimodal strategy development and from the dual character of the agricultural policy, which favors the development of social sectors of agriculture and neglects the private sector development, dominant even then. However, despite leaving the bimodal strategy development and creation of conditions for unique agricultural policy, Serbia enters the transition period with negative medium-term growth rates of agricultural production acquired in the second half of the 1980s.

accomplished level of production does not reach the production volume from the beginning of the transition period [2].

2.1. Structure and Dynamics of Agricultural Production

In the analyzed period, the agricultural production in Serbia shows the upward trend with the relatively significant annual oscillations. These oscillations can be partly explained by the domination of crop production in total agricultural production in Serbia, where cereals have an important place mainly in dry land farming system.[14] Such a production structure implies the significant impact of weather conditions on total volume of agricultural production. From the aspect of crop production and animal husbandry, Serbia is not different from the other countries in the Region, but it has a slightly larger share of cereals in total crop production. In relation to the EU countries, Serbia shows much more extensive production structure dominated by crop production with more than 2/3 of the total agricultural production (Fig. 3).

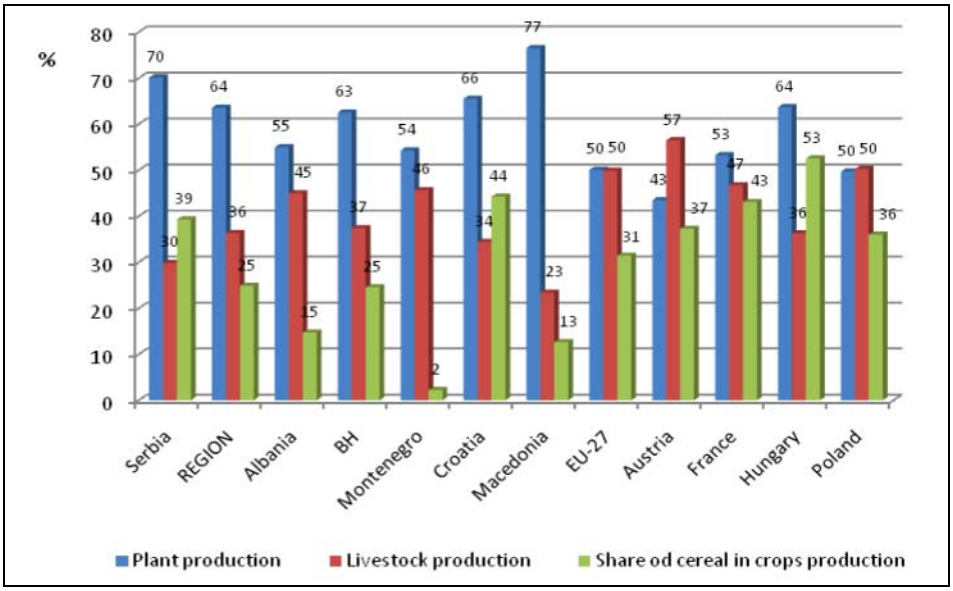

Figure 3: Structure of Agricultural Production
Note: Average for the period 2005-2011.
Source: The authors' calculations on the basis of [1].

[14] In Serbian crop production, corn and wheat are the most common, occupying almost 60% of arable land [7], while the percentage of irrigated land is negligible [1].

The production growth in Serbia still lags behind the other countries of the Region, while the slower pace of agricultural production in the EU (Fig. 4) is in accordance with the achieved high level of agricultural development in most member states, but also with the changes in the Common Agricultural Policy, which, after decades of production subsidies, emphasizes support of farmers' incomes without affecting the volume of production (*decoupling*).

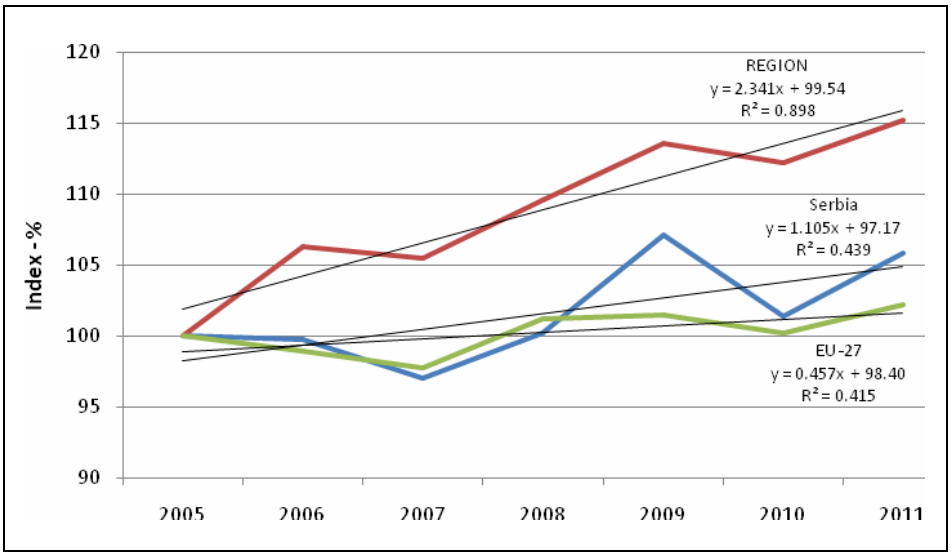

Figure 4: Trends in Agricultural Production
Note: 2005 = 100.
Source: The authors' calculations on the basis of [1].

2.2. Agricultural Production and Productivity

Before analyzing the productivity of primary agricultural resources, it is necessary to consider the resource structure of agriculture, i.e. the relationship between the primary production factors of agriculture, land and labour, which significantly determine levels of partial agricultural productivity. It should be noted here that Serbia has relatively small areas of available agricultural and arable land per active farmer.[15] However, Serbia has a more favourable resource structure compared with the

[15] Term *Active farmer*, in the article, refers to *economically active populationin agriculture* according to the FAOSTAT methodology [1].

average of other countries in the Region, which is relatively low, due to very unfavourable land-labour ratio in Albania. The lag of Serbia compared with EU countries is particularly significant; since they have on average twice as much agricultural and arable land per active farmer (Fig. 5). The unfavourable resource structure of Serbian agriculture indicates the relative over-employment in Serbian agriculture, which is mostly the consequence of fragmented estate ownership [6], and the slow development of non-agricultural sector, which does not have the capacity to accept the surplus labour from agriculture. The unfavourable production structure is also characteristic for the countries with similar ownership structure in agriculture, i.e. the countries with significant share of smallholdings – Albania and Poland.

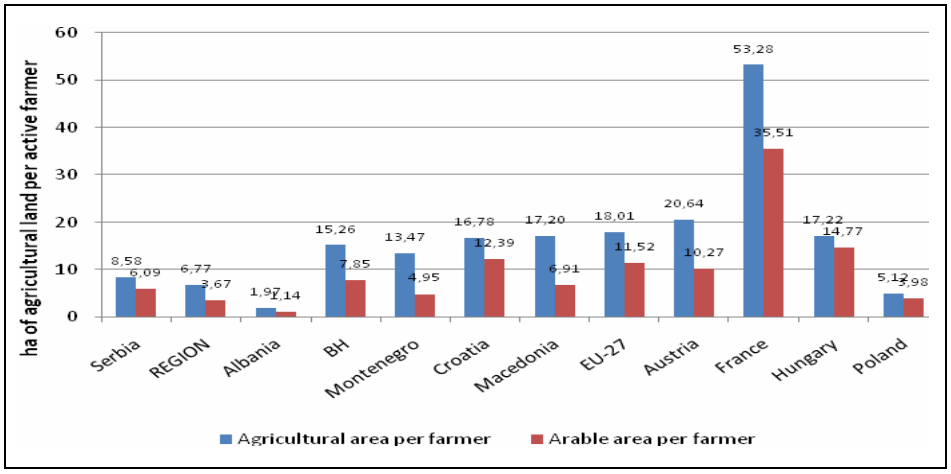

Figure 5: Structure of Resources in Agriculture
Note: Average for the period 2005-2011.
Source: The authors' calculations on the basis of [1].

The labour productivity in agriculture of Serbia lags behind most of the analyzed countries. Its ratio compared with the average of EU countries is 1:3.6, and the lag is even higher, compared with France and is 1:10.7. Compared with the countries of the Region, only Albania and Montenegro, and only Poland compared with the analyzed EU countries, have lower agricultural output per active farmer (Fig. 6). This is fully in accordance with the unfavourable resource structures in these countries, which obviously highly determine the level of partial productivity. Concerning other countries, Croatia achieves more than twice the labour productivity of Serbia, and Hungary almost triples it. The reasons for the low labour productivity are numerous, and in the case of Serbia, the most

important are probably the dominant small estate ownership with semi-subsistence farming using extensive production methods and the phenomenon of hidden unemployment.

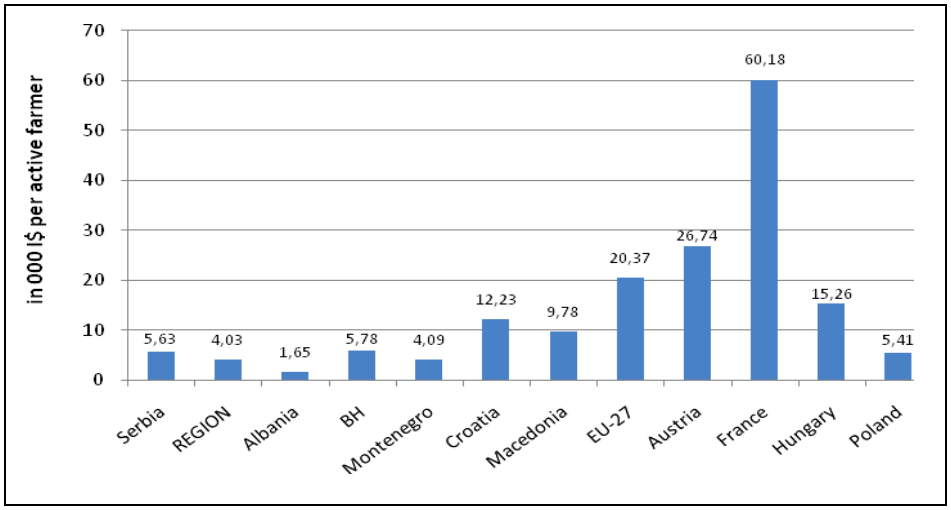

Figure 6: Labour Productivity in Agriculture
Note: Average for the period 2005-2011.
Source: The authors' calculations on the basis of [1].

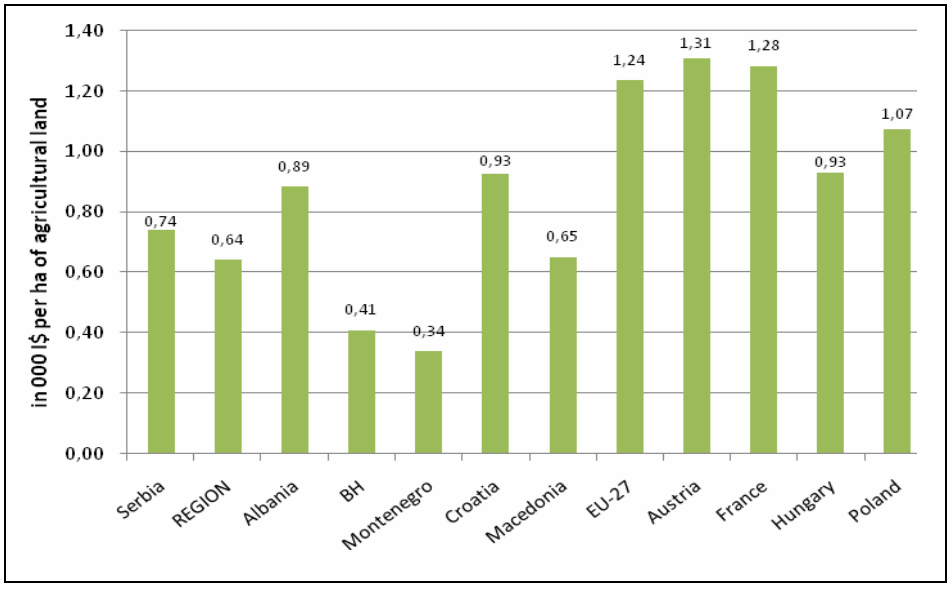

Figure 7: Land Productivity in Agriculture
Note: Average for the period 2005-2011.
Source: The authors' calculations on the basis of [1].

When it comes to the level of productivity of land, the situation is somewhat better for Serbian agriculture – lagging behind the EU average (the data for Austria and France are not significantly different) is not so distinct, and the ratio is 1:1.68 (Fig. 7). The extensive structure of agricultural production in Serbia in terms of the lag in livestock production implies the inadequate utilization of the of crop production potential, or inadequate use of conversion options of less valuable plant products to livestock products with higher added value. In this context, the development of the livestock production would certainly serve to intensify agriculture in Serbia and to increase the total production per unit area.

2.3. Export Performances of the Agri-food Sector

From the middle of the first decade of this century, Serbia has positive foreign trade balance in agri-food products, increasing year after year. These tendencies are the result of improved trade position of Serbia, primarily in the Region, i.e. with CEFTA countries, but also with the Russian Federation and the EU. Namely, the bilateral agreements within CEFTA, trade liberalization with the EU, as well as the privileged position in the Russian market, have significantly contributed to continual Serbian increasing foreign trade surplus of these products.

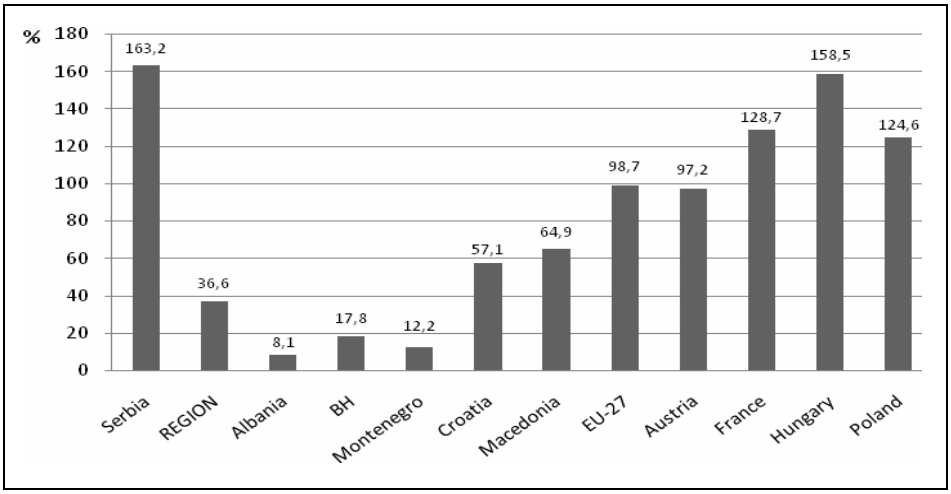

Figure 8: The Export/Import Coverage of the Agricultural and Food Products
Note: Average for the period 2005-2011.
Source: The authors' calculations on the basis of [1].

The Figure 8 shows that compared with the analyzed countries, Serbia has the highest rate of import coverage with export of agricultural products. On the other hand, all the countries of the Region import far more than export, especially Albania, Bosnia and Herzegovina and Montenegro, the last two being the major export markets for agricultural products from Serbia. In addition, the EU is, thanks to the Common Agricultural Policy (CAP), closer to the realization of the permanent surplus in foreign trade in agricultural and food products.

However, it is questionable if the export potential of Serbian agriculture is utilized enough, i.e. if export could be further increased. This can be best seen when agricultural export is related to the basic productive resources – labour and land, and compared with other countries. When the export of agricultural and food products per active farmer is analysed, it can be observed that Serbia does not achieve impressive results, even in the regional context. The situation is even worse in relation to EU countries, which per active farmer, on average, export almost 14 times more agricultural products, Hungary almost 7 times, while in comparison with high-income countries such as Austria and France, it is even more expressed, not in the favour of Serbia (Fig. 9).

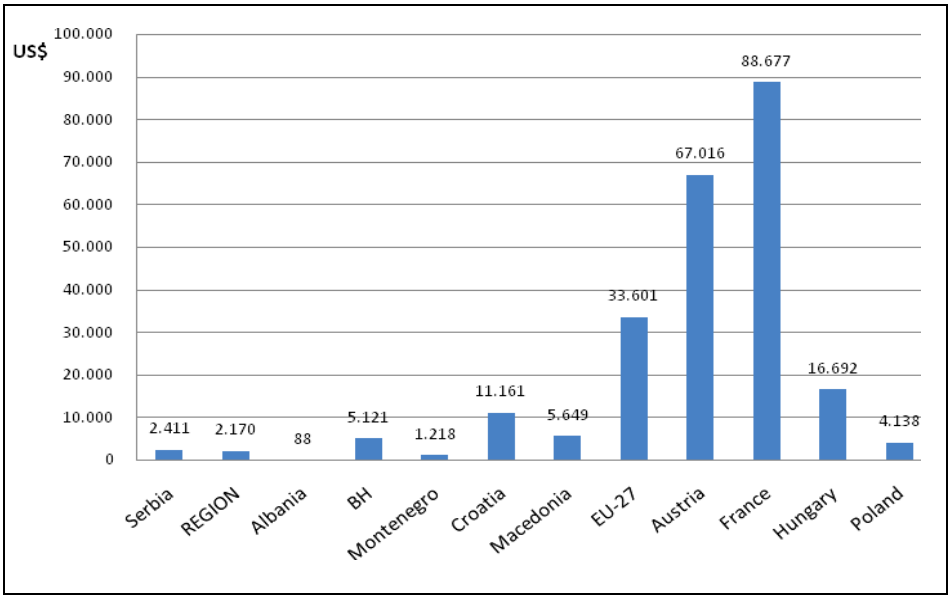

Figure 9: Export of Agricultural and Food Products per Active Farmer
Note: Average for the period 2005-2011.
Source: The authors' calculations on the basis of [1].

The situation is somewhat better in agricultural export in relation to the available agricultural land, though Serbian lag is evident here too, especially in relation to the EU. For example, the EU exports an average of more than six times the agri-food per unit area, and Austria as much as 10 times (*Figure 10*). These tendencies are the aforementioned consequences of the relative extensiveness of Serbian agriculture oriented towards crop production and extensive production methods. Such a production structure dictates the structure of agricultural exports of Serbia, which is dominated by plant products of lower level of processing, or products with low added value.[16] In this context, the small share of products of animal origin and final products[17] is quite alarming.

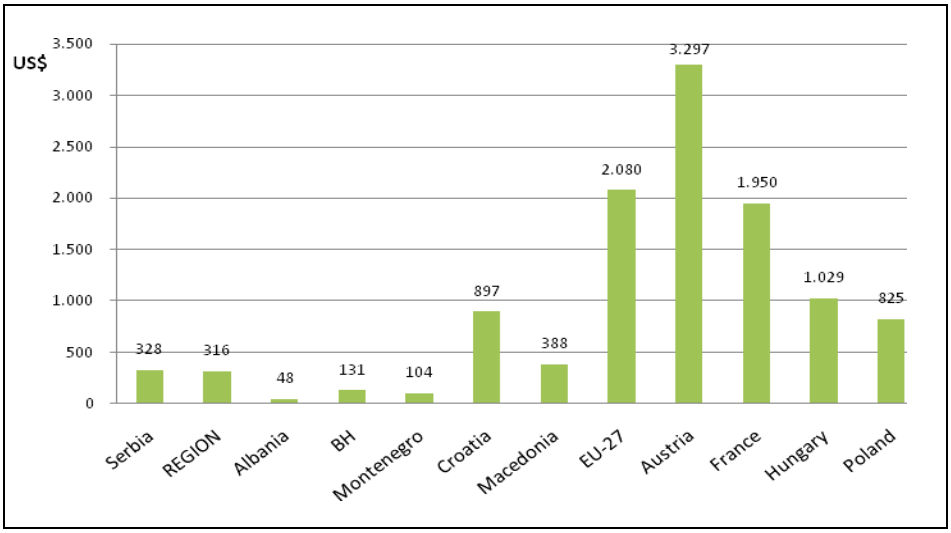

Figure 10: Export of Agricultural and Food Products per Hectare of Agricultural Land
Note: Average for the period 2005-2011.
Source: The authors' calculations on the basis of [1].

[16] Thus, as an average for the analyzed period, Serbia has mostly exported fruits and vegetables, as well as cereals and cereal derivatives. These two product groups, together with sugar, represent more than 50% of the agricultural exports [1].

[17] Considering higher levels of processing, there is a significant share of beverages and tobacco products with just over 10%, while livestock products from meat and meat derivatives represent 4.4%, dairy products and eggs 2.7%, and live animals only 2.2% [1].

3. DEVELOPMENT CHARACTERISTICS OF AGRO-INDUSTRY

After the stagnant development, process of the 1980s, during the last decade of the 20th century, Serbian agro industry, as well as the whole industry, has negative development features. The period 1989-2000 is characterized by the reduction of agroindustrial production that contributes to the industrial production decline rate of 7.9%. Additionally, the decline in production is mostly in animal feed production[18] (10%), while food processing, being the dominant sector of agro industry, declines 5%. The production decline is much less severe in tobacco production and processing (1.4%) and beverage production (0.7%). In the former economic and political environment, in 1993, under the economic and political sanctions by the international community, in the implicitly "imposed" model of closed economy, the sharp decline and the lowest production output occur in food processing (51% compared with 1989) and beverage production (71%). The following positive development trend is very slow in food processing, so in the last year of the twentieth century and after the "humanitarian" intervention of NATO in 1999, it reaches only 55% of food processing volume achieved in 1989, while the beverage production, with significant fluctuations, reaches the pre-recession and pre-transition output level. Animal feed production has the trend of decline by 2000, when it reaches the lowest volume. In tobacco production and processing, the production volume declines by 1997, and after a three-year growth, it achieves the production volume of the year 1989 (Fig. 11).

The decline in the volume of production in the period 1989-2000 is accomplished with the reduction of employment in all areas of agro industry, with simultaneous and even more decrease in labour productivity in the food processing, beverage production and animal feed production, basically being the consequence of the closed economy model imposed by economic sanctions. Only tobacco production and processing shows the tendency of labour productivity growth.

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[18] Production performances of animal feed production are mainly determined by retarded development characteristics of livestock production and the relatively high level of import dependence on the components used in the production of balanced concentrate animal feed.

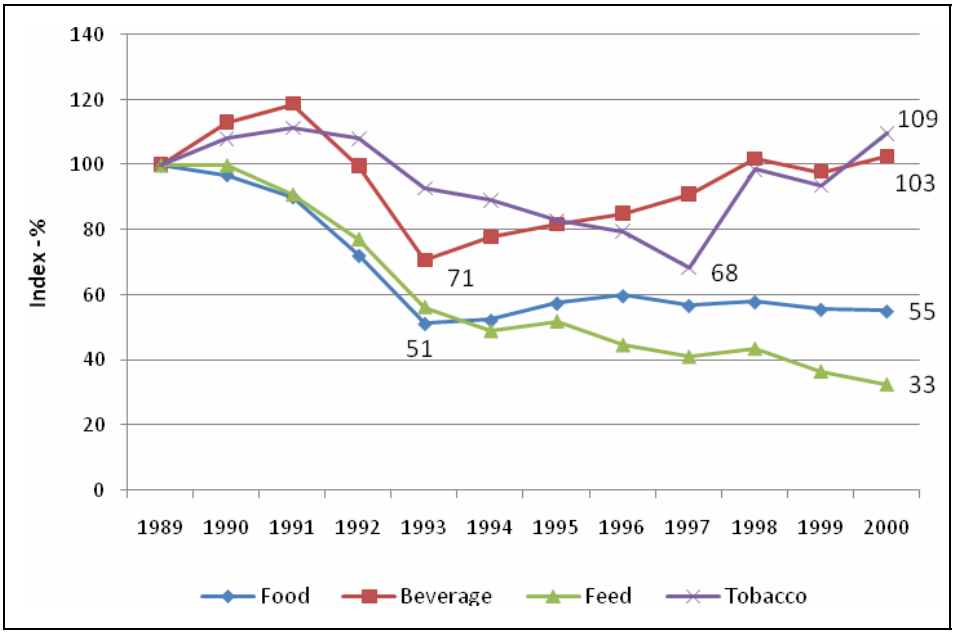

Figure 11: Agroindustrial Production in Serbia (1989-2000)
Note: 1989 = 100.
Source: The authors' calculations on the basis of [7].

Serbian production capacities of agro industry, built mostly in a very different economic environment including the size of the domestic market as probably its most important feature, in the first half of the 1980s are utilized approximately 80%, compared with the projected capacity[19]. The stagnant level of utilization of production capacity of agro-industry and the entire industry of Serbia in the 1980s significantly and rapidly decreases at the end of that and at the beginning of the next decade, which is caused by the above-mentioned narrowing of domestic market, as well as by very limited opportunities for exports in the period after international sanctions of 1992, followed by abrupt and high

[19] The official statistics has published the data on the utilization of the projected and technical capacities. This paper analyzes the utilization of the projected capacity including the year 2000, which by definition of projected and technical capacities, show higher degree of utilization compared with the technical capacity. However, since the utilization trends of both of them are almost the same, the concentration only to the projected capacity does not question the results of the analysis.

liberalization of foreign trade without adequate measures to protect domestic production. The significant increase in the level of capacity utilization is achieved only in the tobacco production and processing[20], with the "moving" around or above 50% in the 2000s, which is still significantly below the pre-recession and pre-transition period. In the same period, in the other segments of the agricultural industry, the capacity utilization is approximately 40% in food processing, just under 40% in beverage production, and about 30% in animal feed production.[21]

Locating the analysis of development characteristics of agro industry in the transition period 2001-2012, when the economic system significantly changes and the process of European integration begins, leads to the conclusion that the development process is characterized by the positive development trend. The most increase is in the tobacco processing (2.2%), while the lowest growth rate in the agricultural industry is in the beverage production (0.7%). In the food processing[22], as the dominant segment of the agroindustrial production, the average growth rate is 1.5%, and it has the greatest weight in determining the development of agroindustrial production performance. The detrimental fact is that the tendency of growth in the food processing and beverage production after 2008, and in the tobacco processing after 2010 is inverted to the tendency of decrease (Fig. 12). This is another supplementary indicator that the process of de-industrialization is not stopped, because the overall tendency of growth in whole processing industry after 2008 is "inverted" to the tendency of decrease, and on the average, the production in the processing industry has been declined at a rate of 0.1%.

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[20] Tobacco production and processing is, together with oil and derivatives sector, the segment of the economy that is in the highest degree exposed to the black market, which has the significant impact on its production performance, and the "filling" of the budget and the settlement of general social needs.

[21] Details on the problems of capacity utilization and the level of achievement and loss of potential output see: [3].

[22] It should be noted that the data for this period are given by the Classification of Activities from 2010 [7], and that there exist significant differences compared with the earlier classifications, the most important being the fact that the animal feed production "is attached" to the previous food processing.

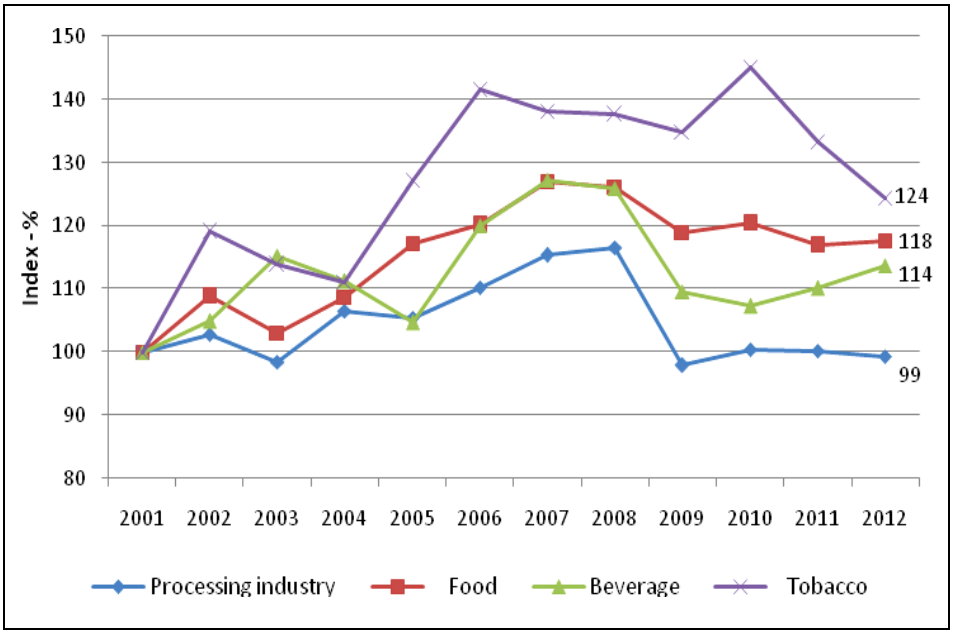

Figure 12: Agroindustrial Production in Serbia (2000-2012)
Note: 2001 = 100.
Source: The authors' calculations on the basis of [1].

In this period, the tendency of output growth is accomplished by reduced number of employees in all areas of agro industry, with simultaneous and strong increase in labour productivity, which is the positive development feature. However, in the context of the aforementioned data on the degree of production capacity utilization, the extremely emphasized reduction of employment in agro industry and the whole processing industry indicates the imperfection of the economic system in the regulation of the impact factor of the transition recession, property transformation and the like.

CONCLUSIONS

The production performances of Serbian agriculture are basically at the level of the regional average, but far behind the EU countries. The ownership in Serbian agriculture is characterized by a high proportion of

smallholdings with semi-subsistence production, and unfavourable ratio of primary agricultural resources, which is reflected in the low available land per active farmer. In addition, the production structure is dominated by a relatively extensive crop production, with inadequate representation of livestock as a generator of agricultural intensity. These characteristics dominantly determine the low partial productivity of agriculture in Serbia – especially the labour productivity. The total agricultural production of Serbia suffers from the low representation of animal products deriving from the extensive character of Serbian agriculture, which is certainly reflected in the structure of exports. Serbian agricultural export, dominated by products with lower levels of processing or raw materials, mainly from crop production, achieves inevitably weaker export performance through the observed low value of export, compared with the engaged labour and land. In this context, the improvement of livestock production and the development of processing industries would significantly contribute to better production performance of agricultural production and increased exports of agricultural and food products.

During the nineties, negative development characteristics are present in all sectors of agro industry, in which the decline in production is accompanied by the decrease in employment. Excluding the tobacco production and processing, in all other sectors – food, beverages and animal food processing – there is the decrease in productivity. In the period 2000-2012, the output growth in the processing industry increases together with the further reduction of number of employees in all sectors, leading to the increase in labour productivity. However, at the end of the first decade of this century, the agro-industrial production is re-reduced. The degree of capacity utilization in the food processing in Serbia is inadequately low and the slightly higher utilization of installed capacities exists only in the tobacco industry. The analysis of production performance and the degree of utilization of projected capacity clearly indicates that in the last twenty years, the agro industry of Serbia "has developed" at a pace that is well below the determined economic parameters, but also below the required level, indicated by the aggregate domestic demand and balance of payments. Such development trends will be fatal, not only for the agro industry, but also for the whole

economy of Serbia. The solution must be sought in a clear and precise definition of development objectives and economic and political instrument operationalization for their realization.

ACKNOWLEDGEMENT

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DIFFUSION OF KNOWLEDGE AND INNOVATIONS IN SERBIAN AGRICULTURE

INTRODUCTION

Since humans started to produce food, two crucial questions emerged: how to ensure continuity in the food production and how to increase yields. Answering those questions by developing (scientific) knowledge on agriculture and practicing it, men have created and still create circumstances for food sufficiency as one of the basic conditions for the survival of the societies, with no regards to the historical epoch, level of social development, type of political system etc. Today, question of food abundance is even more significant because it is influenced by issues such as fast growing population, climate changes and environmental issues in agrocomplexes, market relations between food producers and consumers, relations of power and domination among those who produce food etc.

How contemporary Serbian agriculture looks like? Actually, rural economy and Serbian economy in general are still pretty much based on agriculture. According to the 2002 census data[23], every third household in Serbia is family farm[24], while 60% of the rural households gain income (in whole or in part) from agriculture. On agricultural and mixed family farms live 39.5% of the total farm population, 30.6% of total rural population and 13.4% of total Serbian population. Structure of the labour force on family farms by economy sector clearly indicates the significance of agriculture in Serbian economy, as well. Almost half of the million people in Serbia or $^{1}/_{5}$ of the total labour force is economically active in agriculture [26]. In addition, 87% of the agricultural labour force are farmers. Along with the food industry,

[23] In the paper, authors use 2002 census data because data from the latest censuses (2011 and 2012) are still not published.

[24] According to the 2002 census methodology, farm is defined as a "*every household which at the time of the census uses a minimum of 10 acres of arable land and a household that uses less than 10 acres of arable land, and possesses at least: cow and calf and one cow and bull, or one cow and two sheep, or five sheep or three pigs, or four sheep and pigs together, or 50 poultry or 20 bee hives"* [7].

agriculture makes 10.6% of the GDP and with the sector of raw materials processors, it makes 40% of GDP. According to the 2012 data, 23.9% of total export was from agriculture[25].

Much is expected from the Serbian agriculture. In the daily political discourse, agriculture is frequently mentioned as one of the development potentials and a path toward the rural renewal. However, current state of agriculture indicates that a great deal of Serbian farmers and their families are in unfortunate social position. Part of the answer to the question: Why? is in the partial modernization of Serbian peasant agriculture [37]. Unfortunately, the analysis of conceptual and hypothetical framework of the possibilities and obstacles in (Serbian) agricultural modernization overcomes the limits of this paper. Therefore, for this occasion, only one problem or factor of agricultural modernization has been chosen to analyse. It is a diffusion of knowledge and innovations essential for the contemporary practicing of agriculture. Such agricultural practice should be able to answer the needs and fulfil the expectations of the family farms members, but also of the state and/or society that should be investing in the agricultural development.

1. FAMILY FARMS – FRAMEWORK FOR RESEARCHING POSSIBILITIES AND OBSTACLES IN LABOUR MODERNIZATION IN AGRICULTURE

In spite to the decades of repressive agrarian policy measures towards private land property and peasants, agriculture in Serbia is still based on family farms. Family farms own 84% of utilised agricultural areas [1], 91.1% of the livestock units and, according to the 2011 census, family farms participate with 57% in sales and purchase [48].

Why is labour modernization in agriculture on family farms so important? Data on labour force in Serbian agriculture give an illustrative answer to the question. First, every third resident of rural settlements in Serbia is employed. More than $^1/_3$ (or 38%) of totally employed in Serbian rural population are farmers. If you add to this number approximately 135 000 people who can work and willing to work but are

[25] Data on share of agriculture in GDP as well as share of agriculture in export available on web page of the Serbian Chamber of Commerce - Department of Agriculture [21].

not currently employed, there are more than half a million people who live in rural settlements in Serbia and can be economically engaged in agriculture [26].

Even though it is common to think that contemporary agricultural practice doesn`t require numerous labour force, the analyses of the family farms development in the EU and the analyses of the development potentials of Serbian farms show exactly the opposite. In the circumstances of the economic crisis, multifunctional agriculture can be one of the solutions for the economic activation of available rural labour force. Multifunctional agriculture is contemporary agriculture, which means that one of its basic principles is competitiveness that can be achieved only by continuous modernization of farm/agricultural practice.

Nevertheless, labour modernization on family farms overcomes modernization of agricultural production (especially, when it is understood in a productivity manner as increases of yields by unit of agricultural land and/or livestock unit or specialization of production, etc). By labour modernization on family farms, we understand planned, controlled and directed process of wider changes in a way the agricultural and non-agricultural goods and services are produced. Such process is based on a use of all available and accessible internal and external potentials for the structural strengthening and improvement of functional relations between those who are, in some way, involved in production on family farm. This means that the crucial element in labour modernization on family farms is „*adoption of new ways of doing things*“[32].

In the context of Moseley`s statement and presented framework for the analysis, one of the crucial factors in labour modernization in agriculture on family farms is diffusion of knowledge and innovations. By innovation, we understood a new way of looking at the things or „*package of new social and technical arrangements and practices that implies new form of co-ordination within a network of interrelated actors*“[27]. In fact, innovations are new way of combining available elements in the family farm reproduction.

This definition of innovations (that goes beyond the necessary, but not sufficient technical and technological framework) leads to the fact that innovations are here interpreted as a trigger for the modernization of the way of thinking about farm labour and agricultural practice. In addition, the diffusion of knowledge and innovations should enable new

perspectives in reflection of the role and the position of the individuals within the labour division on family farms as well as the role and the position of the family farms within the rural community development.

How adoption and application of knowledge and innovations contribute to labour modernization on family farms? To be exact, this is the way to strengthen farm`s adaptability. Adaptation of knowledge and use of innovations not only strengthen family farm`s development potentials, but also open a new angle of perception of available resources and ways of their combining and activating. Of course, not every innovation is ideally functional. Adoption of a certain innovation involves risk. Risk is related to the compatibility of innovation with present resources and the compatibility among different innovations. However, because family farm (as a system) exists in the constantly changing conditions, learning new mechanisms of adaptation or adoption of innovations seemed to be necessary. At the same time, innovations regarded as primary external elements, if fulfil the needs, are being internalized and become an integral part of internal development potentials or sociocultural characteristics of the family farm.

There is unquestionable connection between the need to adopt and apply knowledge and innovations and characteristics of the family farm. Thus, more socially vital family farms strongly feel the need to modernize labour. Modernized labour enables family farms` reproduction (especially, economic and social reproduction) and, therefore, strengthens social vitality of family farms. Accordingly, the conditions for the intensive role of farms in rural entrepreneurship development are being created, along with the stronger bonding of the farms with the rural community. Additionally, sociocultural characteristics of socially vital family farms determine their stronger request for knowledge and innovations through the various forms of diffusion, including extension work [12].

If you want to understand the problems and necessity for the diffusion of knowledge and innovations in Serbian agriculture, you have to begin with the analysis of agricultural knowledge and innovation system[26] (AKIS).

[26] Labour modernization of family farms is not only about agriculture. Therefore, rural innovations mean innovations related to the improvement of the rural economy, respectively, the development of rural entrepreneurship [9], but also the improvement of the quality of life in rural communities.

According to AKIS, diffusion of knowledge and innovations is a multidimensional process that includes numerous stakeholders involved in the complex network of mutual relations. Insight in basic features of the AKIS in Serbia today reveals that this system is characterised by many heterogeneous stakeholders (by the level of their institutionalization, available development potentials, power and influence). Nevertheless, there is no sufficient functional coordination between AKIS stakeholders[27]. Within such framework, role of the stakeholders should be analyzed, especially when speaking of the role of farmers (or family farms), extension service[28] and R&D organizations in agricultural sciences.

2. PRODUCTION OF KNOWLEDGE FOR CONTEMPORARY AGRICULTURE – THE ROLE OF R&D IN AGRICULTURAL SCIENCES IN MODERNIZATION OF SERBIAN AGRICULTURE

In the introduction, we argue that one of the main factors of the labour modernization in agriculture is application of the results from the research in agricultural sciences, whether they solve the problems in farm reproduction, increase productivity or answer the market/consumer demands [17]. Naturally, the creation of knowledge and innovations for agricultural production improvement is a complex process influenced by various (social) factors. One of these factors is farmers` needs for certain type of knowledge and innovations. In such context, it is obvious why farmers` requires for certain type knowledge have become frequent research issue.

Extension work (as an institutional form of diffusion of knowledge and innovations) is essentially educational process with certain specifics. Based on a principle of voluntary participation and needs assessment (needs for knowledge in general, but also for a specific type of knowledge and innovations), extension work (particularly its content or

[27] Petrović and Janković [37] came to the same conclusion while speaking of the necessity of the analysis of AKIS in Serbia.

[28] More on specifics of the agricultural extension work in Serbia see in [23], [24].

knowledge and innovations that are subject of the extension work) is determined by characteristics, needs and potentials of farmers[29]. Such understanding of extension work, within the imaginary ideal conditions, results in apprehension that researches (especially experimental) in agricultural sciences should be based on the farmers` requirements for a certain type of knowledge and innovations. Nevertheless, real social circumstances deny such ideal presumptions. Direction, scope and goals of the research in agricultural sciences depend (more) on other social circumstances such as financing and available resources, characteristics of scientific and technological development policies, legislation, market characteristics (preferences of the consumers), level of development of scientific knowledge on contemporary agricultural practice and scope and possibilities of their application[30].

When influences of scientific policy and influence of technical and technological development on research in agricultural sciences are being analyzed, except the research course (its goals and directions), the influence of the characteristics of the scientific organizations network must be taken into the consideration. Such characteristics are organizations` structure[31], functional connections, active staff[32], organization of work, finances, characteristics of the cooperation with other stakeholders in the AKIS, scientific productivity etc. According to the 2011 data, there have been 21 registered organizations for the R&D in agricultural sciences or 8.2% of the total number of R&D organizations in Serbia [46].

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[29] At the same time, factors such as sociocultural characteristics of farmers and their families, their motivation but also possibilities to practice agriculture and modernize labour etc. condition demand for agricultural extension.

[30] Gulan [16] emphasized that researchers in agricultural science have created approximately 1500 high-yielding plant varieties and hybrids. In our agriculture, it being used only 30% of the possibilities.

[31] This refers to the structure of the R&D organizations by scientific fields, disciplines and the type of the research.

[32] This applies to the staff structure in the R&D organizations, especially the staff structure of the researchers. Particularly, the significance of professional education of the researchers is being addressed as well as their scientific production (published papers, projects implemented, registered patents etc).

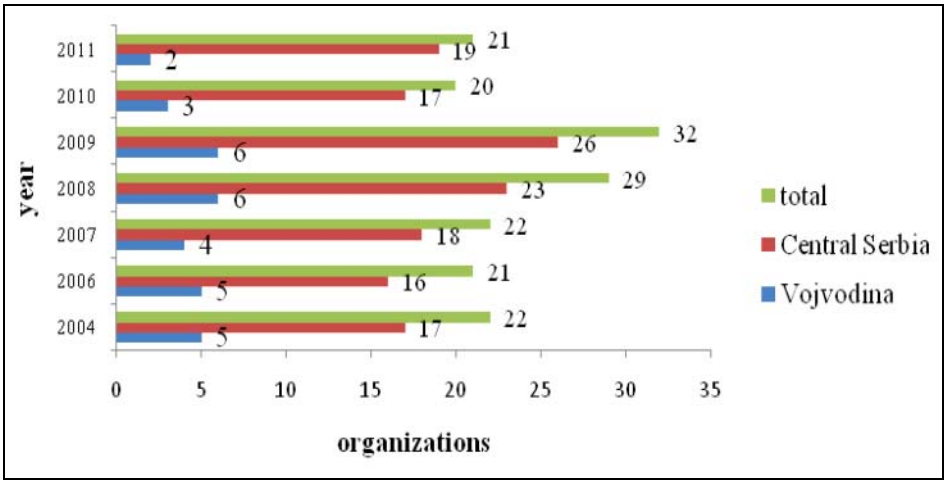

Figure 1: R&D organizations in agricultural sciences in Serbia, by sector and scientific field
Sources: [39], [40], [41], [42], [43], [45],[46].

Number of R&D organizations in agricultural sciences varies within the analyzed period of time (Fig. 1). Most of the organizations are located in Central Serbia. Additionally, changes in territorial distribution of research organizations can be observed. For example, in 2004, one in five R&D organizations was situated in the Autonomous Province of Vojvodina. Seven years later, in 2011, only one of ten organizations was in Vojvodina.

The most of R&D organizations in agricultural sciences are located in the capital city of Serbia, Belgrade (65% of these organizations in 2010 were located in Belgrade and even 76% of the organizations in 2011). Such territorial distribution of the R&D organizations in agricultural sciences has some advantages, but weakness too. To be precise, small spatial distance between the researches employed in the R&D organizations enables (direct) contacts and cooperation, exchange of experiences and an exchange and mutual use of scientific infrastructure. Besides, concentration of the R&D organizations in agricultural sciences in the capital city facilitates communication and cooperation with other institutions relevant for the scientific work or the creation of knowledge and innovations in agriculture. However, centralization of the R&D organizations in agricultural sciences in one location, especially in one which is not the centre of the agricultural region, cause difficulties for the

diffusion of innovations and dissemination of knowledge generated in the researches[33]. Locating these organizations in the large urban and non-agricultural centre also complicates direct contact of the researchers with the producers/farmers and makes difficulties for them to gain much needed research experience. To be harsh, we can ask question whether knowledge and innovations created in such manner match the real requirements in the process of labour modernization on family farms or are such innovations mainly created to fulfil scientific productivity criterion[34]. Moreover, concentration of the R&D organizations in one urban centre makes difficulties for the (direct) contact with the regional and spatially dispersed agricultural extension service and famers, as well.

Most of the R&D organizations in agricultural sciences are nonfinancial organizations (47.6% of the total number of these organizations, in 2011)[35]. Compared with the data from previous years, there is an increase in the number of R&D organizations in agricultural sciences in nonfinancial sector and a decrease in the number and ratio of organizations in the public sector and university sector. Such data indicate two major moments in the R&D, but also diffusion of knowledge and innovations in agriculture. First one relates to the fact that knowledge, information and research results (in the form of practical solutions) are commodity in agricultural input market, but also knowledge and information market, as well. Furthermore, this implies slightly uncertain position of the nonfinancial R&D organizations in agricultural sciences that are out of limited, but still regular budget financing. Such organizations are, more than the other ones, forced to struggle in the very competitive market within the conditions of the (continuing) economic crisis in Serbian society and agriculture. Such circumstances are relevant if we talk about the willingness and ability of Serbian farmers to pay for the necessary knowledge, information and

[33] The importance of dissemination of knowledge reflects in legitimating the knowledge and strengthening its scientific and social confirmation and acceptance.

[34] Of course, by this we not intend to deny the quality of researchers in agricultural sciences or the quality of their researches and generated knowledge. By this, we are trying to draw attention to the negative consequences of the R&D organizations concentration, particularly in those sciences whose results are directly related to the production.

[35] According to the census methodology, „*nonfinancial sector entails enterprises and organizations with principal activity of producing goods and services for the market and selling them at economically significant prices*“ [46].

innovations, not only in terms of sale of agricultural knowledge and innovations, but also in terms of funding the researches.

Another moment, indirectly, can point out to the problem of cooperation between different types of organizations engaged in R&D in agricultural sciences. For instance, we can ask question why nonfinancial sector does not buy Serbian knowledge and innovations in agriculture from the, for example, public or university sector. The answer could be partially in the competitiveness of these organizations on the agricultural knowledge and innovations market. However, we can argue on the functionality of knowledge in Serbian agricultural knowledge market from the point of fulfilling the needs of the farmers[36]. Of course, knowledge market cannot be escaped. Although, it should not be forgotten that commercialization of the research results in agricultural sciences can be stimulating for entrepreneurial behaviour and targeting market niches (on national, but international, particularly regional market). Nevertheless, we should also be careful when evaluating research results from the so-called commissioned researches whose true motives (of a marketing promotion) are often hidden.

R&D organizations in agricultural sciences employed total of 2816 persons or 14.3% of total number of employees in the R&D organizations in Serbia [46]. Most of the employees are researchers (82.6%) and, as if it was expected, most of the researchers are employed in university sector[37]. Some important changes can be noticed in staff structure of the R&D organizations in agricultural sciences. From 2004 until 2011, total number of employees increased (for 6.3%). Number of the researchers constantly increases. According to the 2011 data, number of the researchers in the R&D organizations in agricultural sciences increased 2.3 times, comparing to the 2004 data[38]. Apart from this, number of employees in administration and number of so-called help staff decreased

[36] This is stated in the context of the aforementioned comments on the concentration of R&D organizations in agricultural science in urban and non-agricultural centre that makes difficult for researchers to have direct access to the real situation and the farmers` needs for a specific type of knowledge.

[37] Most of the researchers employed in the university education are educational staff [46].

[38] According to the 2004 data [39], 999 researchers (37.7% of totally employed) were employed in the R&D organizations in agricultural sciences. In 2011, 2327 researchers were employed in such organizations.

for more than a half, while number of technical associates decreased almost ten times[39]. It can be assumed that the part of the employees in the group of technical associates have been promoted to the status of the researcher which, hence, resulted in drastic reduction of their number. These changes in staff structure should be aiming to improve work productivity in the R&D organizations and facilitate the diffusion of knowledge and innovations in agricultural practice.

Among the employed researchers in R&D organizations in agricultural sciences, most of them are Ph.D. (62.4%). From the 2004 until 2011, there have been an increase of the number of employees in all four types of the researchers (Ph.D., M.Sc., specialist and B. Sc.), mostly in the category of the B.Sc. Such change indicates the rejuvenation of the researchers.

On the key criterions in measuring researchers` productivity is a number of completed scientific works (projects and studies). Within the analyzed period (from 2004 until 2011), number of projects and studies in agricultural sciences increased, especially number of completed fundamental research. For instance, in 2004, 34 fundamental researches were completed and in 2011 even 318 researches were finished. Apart from this, number of applied and development researches have been cut in half [39; 46]. Also, number of published papers in scientific and professional publications is also contributing to the increase of productivity in agricultural sciences. Comparing to the 2004, in 2011 number of published papers has tripled – in 2004, there have been 553 published papers in agricultural sciences and in 2011 even 1629 papers. Such change is a result of a new way of evaluation of the researchers' work that undoubtedly has positive effects. Nevertheless, we can argue whether or not a new quantitative criterion for evaluation contributes to the qualitative improvement of the researchers` work. There have also been changes in the type of publications where the papers have been published. In 2011, researchers in agricultural sciences in Serbia published most of their papers in the publications abroad (68% of published papers), while in 2004 only 1/5 of total papers were published abroad.

[39] The base index of change in the number of employees in the administration and support staff in the 2011 is 0.414, while the base index of change in the number of professional staff in the 2011 is 0.101 (base year is 2004).

Certainly, financial resources significantly influence results of the researches. The importance of financial investments in scientific projects in agricultural sciences reflects in the fact that investments are not only necessary for the growth of the productivity and improvement of quality of products, but such investments pay back multiply, both economically and socially. Fuglie и Heisey [15], based on 27 studies, argue that, depending on methodological framework and scope, the funds invested in the research returns in the range of 20 to 60%. Analyzing the return of the investments in the R&D in agricultural sciences on the social level, Fuglie, Ballenger, Day, Klotz, Ollinger, Reilly, Vasavada and Yee [14] claim that most of the analyzed studies showed high return rates.

According to the 2008 data [4], global public spending for R&D in agriculture was 31.7 billion dollars and 51% of total spending are investments in highly developed and highly budgeted countries. The same authors [4] write that in the period from 2000 until 2008 there has been an increase in global spending for R&D in agricultural sciences[40] for 22%. Analyzing the research intensity ratio[41] in agricultural sciences, authors conclude that, along with the economic and social development, the ratio of the research intensity increases. With the economic development, the list of research problems in agricultural sciences expands [4][42].

On the other hand, scientific researches in Serbia in general are continually facing financial problems. According to Branković and Babin [5], value of total science budget in Serbia is low with the declining trends[43]. Data from the 2011 show that the total financial resources spend on the R&D in agricultural sciences in Serbia were 11.8 million EUR [46][44]. In comparison with R&D organizations in other sciences,

[40] According to the authors [3], the increase of the investments in R&D organizations in agricultural sciences in China, India and USA caused the increase of global public spending for the research in agricultural sciences.

[41] Research intensity ratio is ratio between costs of the researches in agricultural sciences and GDP in agriculture [4].

[42] Authors say that are not just problems relating agricultural productivity, but also issues such as impact of agricultural practice on environment, food quality, social welfare and rural development and the like [4].

[43] According to the authors [5], in 2000, 1.39% of the national budget was spent on the research, while in 2009, it was spent under 1% of the budget.

[44] Unfortunately, there is no published data adequate for the comparison of the spending on the research in agricultural sciences in temporal dimension.

R&D organizations in agricultural sciences have the smallest budget (4.9% of total finances for all R&D organizations in Serbia in 2011).

Second major problem in financing Serbian R&D organizations in agricultural sciences is the structure of income. Public (both state and local government) budget accounts for more than $^2/_3$ of the total incomes of R&D organizations in agricultural sciences in Serbia in 2011 (Tab. 1.). Even more, ¾ of the overall budget of these organizations is university sector R&D organizations` budget. Here, we can ask question on efficiency of such model of financing and the money distribution, especially when the main task of the staff employed in the university sector is not a research, but education.

Sector	*Source of financial resources*							
	Own resources	*State and local governments*	*Private and public companies*	*Non-profit organizations*	*Foreign investors*	*Total*	*Average per organization in the sector*	*Average per researcher in the sector*
Nonfinancial sector	67 067	0	31 890	0	231 098	330 055	33 000	8 048.9
Public sector	2 620	196 718	0	0	18 499	217 837	72 612.3	1 336.4
University sector	44 408	615 798	0	0	0	660 206	82 525.7	311.0
Total	114 095	812 516	31 890	0	249 597	1 208 098	-	-
Average per organization	5 433.1	38 691.2	1 518.6	0	11 885.6	57 528.5	-	-
Average per researcher	49.0	349.2	13.7	0	107.3	519.2	-	-

Table 1: Sources of financial resources spent for R&D in agricultural science in Serbia, in 2011 (in thousands of RSD)
Source: [46].

On the other hand, the interesting is that $^1/_5$ of total income of Serbian R&D organizations in agricultural sciences in 2011 comes from the foreign investors. Comparing to the R&D organizations in other sciences, R&D organizations in agricultural sciences and effects of the potential use of agricultural knowledge and innovations seem to be the most interesting for the foreign investors. R&D nonfinancial organizations in agricultural sciences in Serbia have the smallest amount of finances for the research per organization (33 million RSD in 2011 or 315000 EUR). However, such organizations are characterised by the highest average amount of finances for the research per researcher (over the 8 million

RSD in 2011 or approximately 76500 EUR). Such ratio indicates different approach in financial management, partially because of different nature of such organizations and present foreign investors.

The Ministry of education, science and technological development finances the most of the scientific projects in agricultural sciences in Serbia (59.0%) because most of the financed projects are projects of R&D organizations in university sector. According to the data on the number of financed projects, from 2008 until 2011, there has been continuous decline of cooperation intensity[45] between economy and R&D organizations in agricultural sciences in public and university sectors. On the contrary, economy has the most frequent cooperation with the nonfinancial R&D organizations in agricultural sciences. These organizations also have the most frequent cooperation with the foreign investors. According to the 2010 data, 92.3% of all scientific projects financed from the abroad were projects of the nonfinancial R&D organizations in agricultural sciences. Such cooperation intensity is expected because foreign investors through cooperation with nonfinancial R&D organizations gain not only the opportunity to generate knowledge in agricultural science, but to have an insight in market trends (foremost, the requirements for a certain type of knowledge and innovations in agriculture which can be distributed by the very R&D nonfinancial organizations).

Along with the issue of financing R&D organizations in agricultural sciences, it is interesting to point out the changes in amount and structure of the gross domestic expenditure of these organizations. Analyzed data indicate drastic decrease of total value of gross domestic expenditure and gross investments (Tab. 2.). Gross investments in 2011 accounted only $^1/_3$ of the gross investments in 2004 in Serbian R&D organizations in agricultural sciences.

Even more radical is decrease in gross expenditure and gross investments per researcher, which in 2011 accounted $^1/_{10}$ of their values in 2004. Moreover, ratio of gross investments in gross expenditure in 2011, although significantly fluctuates, has increased, comparing to the 2004 (Tab. 2.).

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[45] According to 2008 data, the economy financed 128 projects (or 13.2%) in public sector and university sector. In 2011, economy haven`t finance a single project in public and university sector of R&D organizations in agricultural science.

Year	*Gross domestic expenditure (€)*	*Gross investments (€)*	*Gross expenditure per researcher (€)*	*Gross investments per researcher (€)*	*Ratio of gross investments in gross expenditure (%)*
2004	51 812 688.6	1424.464.4	51 864.6	1 425.9	2.7
2006	87 769 810.1	2296.278,5	89 561.0	2 343.1	2.6
2007	31 522 690.6	2402.599,7	31 118.2	2 371.8	7.6
2008	41 432 279.9	3166.828,4	35 171.7	2 688.3	7.6
2009	32 960 892.7	3633.694,9	29 534.9	3 256.0	1.1
2010	14 963 014.2	838.473,9	6 491.5	363.8	5.6
2011	11 545 279.1	450.372,7	4 961.4	193.5	3.9
Total	272 006 655.2	14212.712,50	248 703.3	12 642.4	5.2
Index (2011/2004)	0.22	0.32	0.095	0.14	1.42

Table 2: The amount of gross domestic expenditures and gross investments in R&D organizations in agricultural sciences in Serbia (2004 - 2011)
Sources: [39], [40], [41], [42], [43], [45],[46].

Very unfortunate is the fact that gross investments per researcher at the annual level account less than 200 EUR. Amount of gross investments per researcher is the lowest in agricultural sciences[46]. Also, amount of gross investments in different types of R&D organizations in agricultural sciences vary. Thus, in nonfinancial R&D organizations in agricultural sciences, average amount of gross investments per researcher accounts 6 061.14 EUR while in R&D organizations in agricultural sciences in university sector it accounts only 40.01 EUR. Presented data necessarily lead to the question of adequate expenditure management in such R&D organizations. Besides, it also signifies the necessity of systematic analysis of the R&D organizations in Serbia (in general and in agricultural sciences, as well). To make it simple, the question is on what terms R&D organizations can acquire consent for practicing the scientific research and who can be a researcher (person engaged in a research[47]).

[46] The amount of gross investments per researcher at annual level in 2011 was 364.59 EUR in humanity sciences while in technical and technological sciences it was 4151 EUR.

[47] Mostly, this refers to the employees in university sector who are primarily engage in education. Due to changes university education in Serbia in the last few years, the question is how many teachers at universities have enough time for scientific work for which they are paid.

3. AGRICULTURAL EXTENSION SERVICE IN SERBIA – CHARACTERISTICS AND POSSIBLE DEVELOPMENT PATHS

We have already pointed out that labour modernization on family farms depends on the interest of farmers (and members of their families). It is obvious, of course, that farmers and family farms are not independent entities. They are unavoidably included in the system of relations with other farmers, farms and households, other agricultural and rural economy stakeholders. Farmers and family farms are also in the complex relations with the environment. Their interest in labour modernization is expressed by willingness to invest in factors of modernization, including investing in required knowledge and innovations. Motivation for investment depends on sociocultural characteristics of farmers and family farms [12], characteristics of rural social structure, features of agricultural policy and policy of rural development, market characteristics etc. Due to the fact that we are analyzing impact of diffusion of knowledge and innovations on farmers` readiness to invest in knowledge, features of the AKIS, especially characteristics of the extension service (such as work organization, personnel, available equipment, funding etc.) must be taken into account as relevant factors when analyzing decision making on farms`` investments.

The role and the significance of the agricultural extension service will be analyzed by the example of the agricultural extension service in Serbia. The very beginnings of the agricultural extension service in Serbia as a socially organized activity aiming towards modernization and improvement of agricultural production are dated in the second half of the 19th century[48] [37]. First institutions for the education of the agronomists and institutions for the diffusion of agricultural knowledge and innovations were aiming towards agricultural modernization not only to increase the productivity in order to ensure food abundance, but to strengthen the peasantry and to improve Serbian export opportunities. All measures were directed towards capital accumulation, which was essential for the development of the industrial sector.

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[48] In this period (1886), agricultural station in Negotin was established. Beside the intention of educating farmers how to improve viticulture (typical for the region), agricultural station was controlling quality of grapevine grafts [20]. Agricultural station is still active. Besides Negotin, agricultural stations in Kruševac and Leskovac also have long history in agricultural educating of the farmers (1900) [20].

The Second World War in which the peasantry, as it has always been, submitted one of the biggest victims has shaken newly founded agricultural extension service to the core. After the war, during the 1950s, Regional Plant Protection Stations have been founded. Agricultural stations and institutes were later developed from Plant Protection Stations. Those agricultural stations and institutes are organizational framework for the agricultural extension service in Serbia. By the 1990s, agricultural stations and institutes have been cooperated mostly with the agricultural combines, but the breakdown of the public sector of Serbian agriculture has directed the course of the diffusion of knowledge and innovations in agriculture toward family farms[49].

For a last decade and a half, Serbian agricultural extension service consists of both public and private sectors[50]. We are going to analyze only public agricultural extension service because it represents public endeavour to modernize agriculture. Public agricultural extension service in Serbia consists of two major organizations: Agricultural Extension Service of Autonomous Province of Vojvodina (later: AES APV) and Agricultural Extension Service of Serbia (later: AESS). The *Law on Extension Work and Professional Services in Agriculture* (2010)[51] which, for the first time, clearly defines extension work in agriculture and the organization of extension service regulates work of both extension services.

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[49] Ministry of agriculture, forestry and water management of the Republic of Serbia since 2001 applies the concept of so-called chosen family farms in the work of public agricultural extension service. Chosen family farms are selected for a period of time during which they cooperate intensely with the extension service. The aim of the cooperation is labour modernization in agriculture, which will enable transformation of chosen family farms in exemplary farms and therefore contribute further diffusion of agricultural knowledge and innovations.

[50] There are two types of private agricultural extension services. First type is agricultural extension services engaged in providing professional assistance in agricultural production. The second ones are agricultural input traders who, complementary with trading, provide professional help in agricultural production.

[51] Before the legislation, work of the agricultural extension service was regulated by the Law on professional agricultural service (1991) which, beside positive, consisted of some problematic solutions for the important issues such as scope of the agricultural extension agent`s work. Even though agricultural extension work was, by law, delegated to the agricultural stations and institutes named as Agricultural professional service [37], it was not precisely defined what are the activities of an agricultural extension agent. In practice, that has resulted in the fact that one extension agent, beside extension work, have being engaged in other activities that could have been in a collision with the extension work (e.g. control).

AES APV is under supervision of the Department of Agriculture, Water and Forestry of the Autonomous Province of Vojvodina. By the *Law on Establishing the Competence of the Autonomous Province of Vojvodina*, Department of Agriculture, Water and Forestry establish professional activities and programs for the modernization of the agriculture at the territory of Autonomous Province. In addition, Department of Agriculture, Water and Forestry of the Autonomous Province of Vojvodina is a founder and controller of the AES APV work. AES APV consists of 12 regionally established and organized units working within agricultural stations and institutes[52]. It employs 94 extension agents [2] that are working in seven districts of Vojvodina.

AESS activity area includes 17 districts in Central Serbia. The service consists of 22 territorially organized units. It employs 143 agricultural extension agents [33]. AESS is under supervision of the Institute for Application of Science in Agriculture. The Institute controls the work of the AESS on the behalf of the Ministry of Agriculture, Trade, Forestry and Water Management of the Republic of Serbia.

The majority of the employed extension agents [53] are men (59.6 %), which indirectly indicates that agriculture and agricultural extension work are still regarded as traditional male occupations. Experts on field and vegetable crops are the most numerous extension agents (29.8%) which match with the production structure on family farms. Nevertheless, considering the regional differences in the agricultural production structure, some variations in the staff structure of extension agents can be observed. Thus, among the extension agents in AES APV there is a significantly higher proportion of experts on field and vegetable crops (35.9% versus 28.7% among agents in AESS), while among the extension agents of AESS there is far more experts on horticulture and viticulture (18.8% versus 5.6% in AES APV).

Reform of the public agricultural extension service is necessary. Actually, Serbian society deals with a decade long urge for the extension service reform. Two major questions are crucial in this context: why are we still talking about the need for the extension service reform (i.e., why is reform so slow) and in which aspects of the agricultural extension

[52] Since 2010, AES APV was consisted of 13 organizational units. In 2010, two regional units merged (Kovin and Vršac).
[53] On the importance of staff structure in extension service, see more in [44].

work is reform required[54]. Naturally, talking about the need for the reform does not mean that there is no reform at all. The *Law on Extension Work and Professional Services in Agriculture* (2010) was the important step towards reform of the agricultural extension service in Serbia. Normative regulation of the questions who can be an extension agent, how and with whom extension work should be taking place, how extension work is financed etc. are significant elements in creating a modern agricultural extension services in Serbia. However, the question is whether the pace of changes and systematic overcoming of the problems in the extension service of Serbia are adequate considering the requirements of agricultural modernization.

Characteristics of the extension service itself, but also characteristics of the superior institutions provide answer to the question why reform of extension service in Serbia has been going so slowly. Hereby, we mean of often declarative dedication to the extension reform (within the daily political discourse) with no or partial action towards elimination of "bottlenecks" in the work of extension service because such actions can cause negative or even harsh reactions of those who work in the extension service. Actually, it seems that discontinuity in the public policy towards extension service (sometimes accompanied by insufficiently articulated reform attitude) slows down the process of transformation. However, it should be pointed out that the responsibility for slow reform must also take extension service itself. Often, agricultural extension service, while attempting to survive in the turbulent times of social transformation and crisis, preserves *status quo.*

The answer to the second question concerns the identification of the problems in the work of the extension service and identification of the necessary reform aspects. It is possible to observe at least two directions of the reform of agricultural extension service in Serbia. The first one relates to reform from within and the other one regards the reform from the outside. The reform from within includes standardization of an agricultural extension work as a profession as well as changes in the way the agricultural extension work is practiced. This mostly refers to the more intensive use of group methods in the agricultural extension work [11], planning the agricultural extension work with the family farms [31], enhancing teamwork among extension agents and extension agents and

[54] This is, actually, the issue of problems in the extension service practice. Such problems should be overcome by the agricultural extension service reform.

other agricultural experts etc. On the other hand, reform from the outside implicates clear definition of agricultural extension goals [24], domains of the extension practice (agricultural and rural extension), organization of the service, finances, functional and structural links with other stakeholders in the AKIS etc.

4. SOCIOLOGICAL AND RELATED COMPREHENSIONS OF THE DIFFUSION OF KNOWLEDGE AND INNOVATIONS IN SERBIAN AGRICULTURE – CURRENT STATE AND DEVELOPMENT PATHS OF SCIENTIFIC THOUGHT

To understand the current state and future prospects of rural sociological and related comprehensions of the diffusion of knowledge and innovations in Serbian agriculture, it should be mentioned that this issue occurs in the early works of Serbian authors who researched agriculture and rural social structure. Although primarily concerned with problems of agricultural cooperation (both in theoretical and practical manner), Avramović speaks about the differences between large and small family farms, especially from the perspective of diffusion of agricultural innovations. He concludes that process of diffusion of innovations is much easier on the larger family a farm, while on small farms diffusion of innovations is facilitated by joining the agricultural cooperation [3]. Vukosavljević[54], one of the founders of rural sociology in Serbia, while analyzing the peasants` labour and diffusion of technical knowledge in Serbian agriculture, points out that the reasons for the slower diffusion of innovations are, among others, absence of financial resources, but also reduced need for saving the labour force on family farms. Vukosavljević [54] vividly describes that peasant "*had no savings*" and, therefore, no money to buy new tools and machinery. He adds "*expensive tools are not worth on the farm if they are not used enough. When there is more labour force, it does not pay to buy all of the tools that are used sufficiently and that can make labour faster and save labour force"*. In addition, Vukosavljević points out that part of the resistance to the diffusion of technical innovations in peasant agriculture lies in the fact that innovations are way of disturbing "*previously established schedule of the labour force"* [54]. Vukosavljević concludes correctly when says that problem in search for innovations is in the fact that "*he (peasant – A/N)is always on the limit of his resources and therefore he cannot take the risk of untested innovation. Nevertheless, he is uneven. Peasants are slow but also vary fast in recruiting innovations.*

While objective conditions mature" [54]. With such views, Vukosavljević confirms one of the Mandras`s rules of peasant economy (it is a family economy based on a relation between number of labour force and people who have to be fed) and Chayanov`s thesis on the impact of the family cycles on labour organization on family farm and agricultural modernization.

Work of Vojislav Đurić has been significantly marked the post-war sociological research of the diffusion of innovations. When Đurić writes about the nature of innovations, he emphasizes its social or "*supra-individual, non-private, group character*" [13]. Accordingly, the author defines innovation as "*any socially purposeful, rational and historically appropriate instrumental or teleological value which has recent origin or recent change in its existing form, function and content or with which people have been recently reached contact and which, accordingly, has not yet been extended to saturation in social environment*"[13]. Similar to Rogers, one of the most influenced 20 century authors on diffusion of agricultural knowledge and innovations, Đurić also thinks that diffusion of innovations is "*a process of social presentation of new values in order to be adopted and used by interested social actors, accordingly with their characteristics and characteristics of the social system they live in*" [13]. Besides Đurić, Stevanović also analyzed the process of the diffusion of knowledge and innovation in agriculture in the context of agricultural industrialization. He pointed out that agricultural industrialization implies "*the use of scientific methods in production, especially to increase the scope of production, ensure the scientific labour organization, predict market trends etc."*[49].

The recent period in the development of rural sociological comprehension of diffusion of knowledge and innovations in agriculture is marked by the work of rural sociologists from the Faculty of Agriculture, University of Novi Sad (Petrović, Janković, Čikić, Petrović). The authors have been researching needs for knowledge and difficulties in the diffusion of knowledge and innovations in Serbian agriculture and characteristics of agricultural extension work for 10 years. They have published more than 30 scientific papers. In addition, they have conducted 10 scientific projects relating agricultural extension[55].

[55] More on projects and published papers of the group of rural sociologists from Faculty of Agriculture see on [19].

Beside rural sociologists, the other comprehension of the diffusion of knowledge and innovation in agriculture in Serbian science is agricultural economists` understanding. While researching the issues such as current state of extension service in Serbia and its development potentials [28], the role of extension in agricultural development [52; 30; 35; 51], comparing organization of extension service in different countries [29; 34], analyzing the role of web applications in extension service practice [55], agricultural economists contribute to the overall understanding of the organization and role of the extension services in the process of diffusion of knowledge and innovation in Serbian agriculture.

CONCLUSIONS

The analysis of the characteristics of the diffusion of knowledge and innovation process in Serbian agriculture shows that the system in which this process is being situated is marked with several problems, regarding stakeholders and their mutual relationships. If we observe only three basic stakeholders of such system (farmers, R&D organizations and agricultural extension service), it is possible to establish few important practical points in order to eliminate stakeholders` internal and relational difficulties.

First, social vitality of most of the family farms in Serbia is disturbed. Average utilized agricultural area of the single farm is 4.5 ha [1]. More than $^2/_3$ of Serbian family farms have less than 5 ha of agricultural land[56]. The characteristics of the land structure clarify why four out of ten farms have no tractor[57] [1]. Ageing index of agricultural population is very high [8][58]. Unlike the total economically active population (where 45.6% of economically active is from 20 to 39 years old), only ¼ of agricultural population is in this age and 29.1% is 60 years old or even more. More

[56] According to the agricultural census (2012), 1.5% of the family farms in Serbia have no agricultural land. Almost half of the family farms have less than 2 ha of utilized agricultural land and 29.4% have from 2.1 until 5 ha of agricultural land [1].

[57] Only three out of ten farms that have less than the 5 ha have tractor. In the category of family farms that have more than 20 ha of agricultural land, every farm has two tractors, in average. On social aspects of technical base for agriculture on farms, see more in [36].

[58] Ageing index of agricultural population in Serbia is 1.16.

than 70% of active agricultural population have no formal education or have only partial primary education [6]. Such characteristics of social vitality of Serbian family farms undoubtedly indicate the necessity of acquisition of agricultural knowledge and innovations, especially if farmers intend to produce food for the competitive market. Therefore, one of the first steps in agricultural modernization on family farms is enhancing farmers` awareness of the significance of investing in knowledge and information and the ways to gain such knowledge.

According to the *Innovation Union Scoreboard* [22], in the last five years Serbia have increased budget for the scientific research for 22.2%, but total research funds are still very limited[59]. Nevertheless, beside all the progress and relatively favourable characteristics of human capital in R&D sector, Serbia falls into category of modest innovators with performances under average level [22]. Besides introducing the unambiguous rules for practicing scientific work, the main problem in R&D organizations in agricultural sciences is a question of finances. Experiences from the developed countries show that investments in R&D organizations are vital for agricultural development. The issue of budgeting is accompanied with the question of the extent in which the R&D organizations in agricultural sciences have to self-provide necessary financial resources. In simple terms, the question is whether and in what scope R&D organizations in agricultural sciences are ought to be left to the market conditions. Current data indicate insufficient level of cooperation between economy and research in agricultural sciences. According to the document "*Strategy of development of the Republic of Serbia until 2020*" [47], beside increase of finances for R&D, the objective is to rearrange resource structure in order to achieve half of the overall budget from the economic sector.

Changes in R&D organizations budget structure in general (and in budget of the R&D organizations in agricultural sciences) are associated with project financing. Intensification of the cooperation with economic sector (especially with private sector) has two main benefits. First, it is a way to increase total amount of finances for the R&D. It is also mode to reform financial management in R&D organizations in a way to commit the funds for the investments (such as purchase of equipment, training etc.).

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[59] According to Šabić [50], only 0.3% of Serbian GDP is assign for research and development.

Knowledge, information and innovations are commodities with a certain level of supply and demand and, therefore, price (like any other commodity present on the market). Therefore, a part of the investment in R&D in agricultural sciences should be orientated towards marketing activities and strengthening of the market recognition of research organizations.

The reform of the agricultural extension service in Serbia is a necessary step in creation of functional stakeholders within the agricultural knowledge and information system. If Serbian agricultural extension service embrace it's contemporary role of a broker [18; 25], it will not only actively be involved in a process of agricultural diffusion of knowledge and innovation for improvement of agricultural production, but also it would facilitate the articulation of farmers' needs for a specific type of knowledge. In addition, if knowledge and innovation are treated as a commodity, it requires a change in extension approach. Demand-driven or farmer-driven (farmer-led[60]) approach raises the issue of extension work commercialization over the issue of farmer`s choice of extension agents for cooperation. Demand-driven extension implies more than a knowledge and innovation transfer. This approach implies existence of open communication channels between different and often very heterogeneous stakeholders within agricultural innovation system, whereby, stakeholders` characteristics[61] and their relationships define characteristics of the stakeholders' network, nature of the information that are being exchanged and the very character of the communication process.

Diffusion of knowledge and innovation in agriculture should be considered as a process of creation of family farm`s assets [53]. The manner this would be achieved, as well as development scope and the type of assets do not only depend on characteristics of farm`s social vitality, but also on the policy of agricultural and rural development, level of stakeholder`s integration within the agricultural knowledge and information system, development and availability of the institutions and organization relevant for the biological, economic and social reproduction of family farm, characteristics of the research in the

[60] The concept is used as an antonym for the concept of T&V system in agricultural extension as a typical top-down or supply-driven model.
[61] Stakeholders' network in AKIS consists of actors with a different level of homogeneity, organization skills, power, financial and social capital.

agricultural sciences (and similar scientific fields), extension service etc. One of the first steps in achieving family farm`s assets is the analysis of the farm`s development potentials and needs for specific knowledge and innovation. Such research should be accompanied by the analysis of the willingness and ability of farmers to seek knowledge by them. However, it should not be forgotten that every stakeholder within agricultural innovation system have on disposal certain level of social power. Ability to influence is the key factor in determining stakeholders` relations with other stakeholders within the system (especially, with ones who are in position of knowledge), but also in determining the possession of required (mostly, financial) resources for work modernization. This is particularly important if the long-term objective of the work modernization of family farms in Serbia is enhancing rural entrepreneurship and, consequently, improvement of sustainability of local rural communities [10].

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LONG-TERM STRUCTURAL CHANGES IN THE AGRARIAN MARKET IN SERBIA (1990-2010): CYCLICALITY OF PRODUCTION, OLIGOPOLISTIC OF DEMAND, EXTENSIVE GROWTH OF EXPORT

INTRODUCTION

When official institutions are concerned, as well as rarely in professional-scientific circles, there are almost no rather complex analyses of long-term movements and total trends in the Serbian agrarian market (agricultural production, domestic consumption, agrarian export). Meager macroeconomic indicators are most frequently related to one economic year or, however, to only the current (selected) five-year period, taking into consideration neither radical internal systemic and production-structural changes nor the consequences of the changes in the position of the Serbian agriculture in a new market environment (the old neighbourhood and the new one), either. Therefore, in this paper, we have decided to analytically gain an insight into the development of agriculture and the agrarian market in a relatively long period, which encompasses the circumstances prior to the disintegration of the common state, then for the duration of the period of the so-called transition, and, finally, the period of independent development.

So, the considerations in this paper relate to the twenty-five-year period of a broader dividing line between the two centuries (one decade of the prior century and one decade of the current century). In that period, which is relatively short from the point of view of its duration, but very turbulent from the point of view of social-historical changes, Serbia and its economy, as well as its agriculture, experienced very big, almost epochal political, economic-systemic and structural changes. This period includes the decade prior to the violent secession and the disintegration of the SFRY, the period of the existence of the SRY/S&MN, and the first decade of the new century and Serbia's independency. At the same time, and in many aspects, the whole period is analytically observed by five-year segments (the base period of the analysis is the 1986-1990 five-year period).

The more complete analyses of the movements and long-term characteristics of the production of agricultural and agro-industrial products, within the framework of our earlier and more recent broader monographic researches [4, 5] and on the basis of the observations of the indicated data long-standing series, are indicative of the extensification and stagnation of and falling trends in production as well as of the cyclical instability and internal regional differences of the production volume and structure. Given the observed period and general circumstances which they are taking place in, such trends can be referred to as the transitional distortion of agriculture and the agrarian market.

The transitional distortion of the overall economy, as well as of agriculture and the agrarian market, is no Serbia-specific feature. If the growth and the achieved level of the gross domestic product (the GDP) is a measure of a country's success, then the last two decades are a period of a continuous crisis and the stagnation of the largest number of transition countries, which went through that period by "marking time", while some were making a big step "backward", and the most prosperous ones achieved an around 1-2% growth, which is ten times or so more slowly than in China [5].

For a number of years, agriculture and agro-industry have been marked as the sheet anchor of the Serbian economy in the international market. Apart from the degree of the competitiveness of domestic products, the key hurdle in the achievement of such commitments, is the always present (either direct or indirect) agrarian protectionism and interventionism of developed countries in the agrarian market, which, in order to protect their own products, generously subsidized both producers and exporters of agrarian products. The programs of state interventionism were not model formalized for a long time, but, as time passed, their analysis has evolved towards the economic effects of the distribution of incomes and costs amongst different interest groups [2].

The consideration of the export potential of the agrocomplex and its place in the economic structure is most frequently reduced to the analysis of the movement in the volume and structure of export and import, i.e. of the net balance of the foreign trade of agrarian products, classified according to the Standard International Trade Classification (SITC). The specificities of agrarian production as well as the commodity classification are related to the difficulties accompanying the separation of agricultural products (as unprocessed raw materials) and foodstuffs (agro-industrial products), as final processing products, i.e. products

prepared for direct consumption. Here, the subject of the comparative analysis of agrarian export and import, the groups of agricultural products and foodstuffs are the most important ones, namely those in *Section 0* – Food and Live Animals. However, for a more complete analysis of the agro-food sector, it would be needed to include some more commodity sections or yet only some divisions which cheeses and final products of an agricultural origin are classified into, or yet industrial products whose consumption is intended for agriculture. In that way, the analysis of the comparative advantages, competitiveness and potential agrarian foreign trade of Serbia would include all the three key segments: (1) pre-farm activities (industrial inputs for the agrarian sector); (2) primary agriculture (agrarian raw materials for the processing and production of food) and (3) post-farm activities (the processing, trading and consumption of final foodstuffs). However, much more time and space is needed for such a complex analysis to carry out than the framework of this paper allowed.

1. TRENDS OF GROWTH OR FALL IN TOTAL AGRICULTURE

In the last twenty years, the dynamics of the Serbian total agricultural production have been demonstrating an extremely cyclical instability, stagnation or a much slowed down growth, with significant differences between plant and livestock production. In plant production, the annual oscillations have been ranging between minus 30 to plus 50 index points (Tab. 1). Such a high instability in the volume and structure of plant production, and therefore of total agrarian production, primarily appears under the influence of natural factors.

	1991	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*
Total	110	82	97	106	105	102	106	99	100	87
Plant production	140	69	97	111	108	102	114	92	104	73
Livestock breeding	90	100	94	100	106	100	100	102	99	95
	2001	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Total	117	97	93	119	95	100	92	108	101	101
Plant production	150	96	83	143	94	94	82	123	104	101
Livestock breeding	99	102	98	100	102	97	100	97	96	101

Table 1: Agricultural production chain indices, 1990-2010
Source: [15]

Given its biological specificities and production inertia, the oscillations in livestock production are also relatively high, but ranging between plus/minus 6 index points. Throughout the period, plant production in almost every second year records a fall in comparison with the previous year, whereas livestock breeding has either a zero or negative growth rate in even 16 out of the 20 observed years! Therefore, differently from the sinusoidal trend of plant production, it is possible to see a parabolic trend of the falling of livestock production. Consequently, there is a continuous reduction in the structural share of livestock breeding, i.e. a decrease in the productivity and intensity of total agriculture, dominantly based on the lagging of and a fall in livestock production. It follows therefore that the process of the extensification of total agriculture is less under the influence of natural conditions, but is rather (via livestock breeding) primarily under the influence of inappropriate economic-systemic factors.

1.1. The Alternateness of the Annual Growth and Fall

From the comparative observation of the chain indices of the plant and livestock production in the twenty-year period, it is possible to note a particular interesting regularity: the alternateness of the current annual rise and fall in plant and livestock production (Fig. 1).

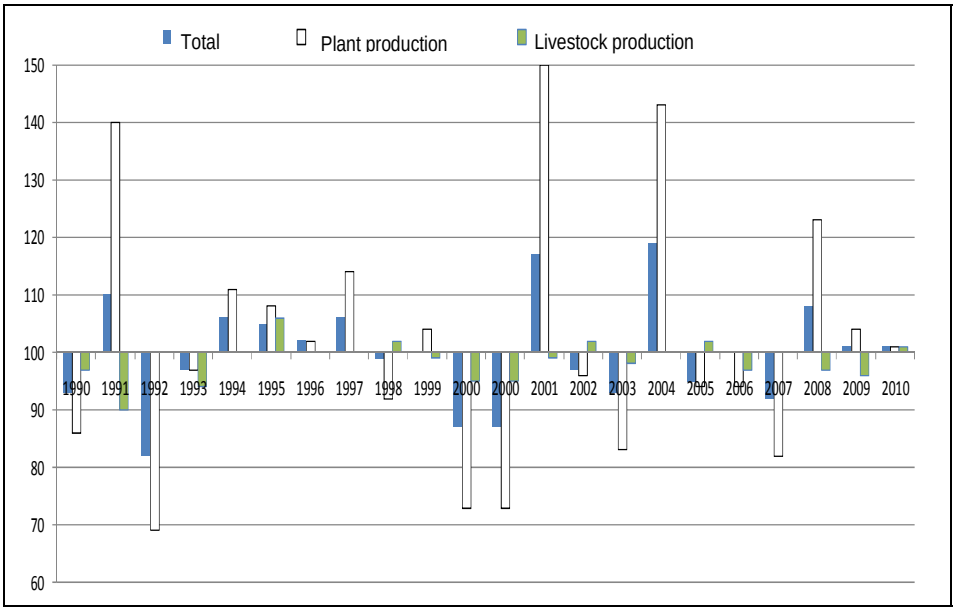

Figure 1: The alternateness of the cycle of soil cultivation and livestock breeding (the 1990-2010 chain indices)
Source: Table 1, Processed by the Author.

Namely, throughout the observed period, only in three years did the chain indices of plant and livestock production have the same direction, i.e. in all the other years there is a regularity – if there is a fall in plant production in the current year, then livestock breeding will also be falling, however not in the same year but no sooner than in the next year. Although this statistical picture is indicative, due to the temporal nonconcurrence of the phenophases in plant production and the length of the production cycle in livestock breeding, the causal-consequential connectedness between an increase and a fall in the production of these branches of agriculture cannot be established in one – current year, but the objectivization of the regularities of their relations can be deduced by observing the movements in continuous annual production successions [10].

The base indices of the agricultural production in the 1990-2010 period represent a much more realistic picture of the development of agriculture in time. If the year 1990, as the conditionally ultimate year of the pre-transition period, is considered as the base year, a substantially more reliable picture of the dynamics of agricultural production in the past period is gained. Yet, this picture, too, and quite expectedly, shows big differences in the dynamics of plant and livestock production [5]:

- the annual level of plant production throughout the period, except in the three years, was above the volume achieved in the base year;
- contrary to this, not in one single year of the observed period did livestock production reach the volume achieved in the base year!

1.2. The Sinusoid of Soil Cultivation and the Falling Parable of Livestock Breeding

The production trends derived from the base indices also account for the sinusoidal movement of plant production, whereas a falling parable is characteristic for livestock breeding. However, apart from the undoubted significance of the intensity of the changes in production, the direction of those changes is of much greater significance at this point (Fig. 2). Namely,

- although moving sinusoidally, as a whole plant production has a positive flow, which has a rising direction as the period is coming to its end;

- unfortunately, throughout the period, livestock breeding has an extremely negative trend, so that the volume of livestock production is by around 20% lower at the end of the period than it was at the beginning of the period!
- after the negative flow accounted for in the first half, the trend of total agricultural production, as the resultant of the movements in plant and livestock production, shows the values somewhat above the base ones in the second half, so that it has a form of a slightly rising line as the period is coming to its end;
- Finally, if the indicated movements are expressed in an average rate of growth/fall, then we gain an even clearer picture of the dynamics of production changes in agriculture in the last twenty years. Therefore, based on the presented data, it follows that: plant production has been growing at an average 2.0% annual rate; livestock production has continuously been falling at an average (minus) –1.2% annual rate; total agricultural production has on average had a very modest growth at a 0.4% rate per annum.

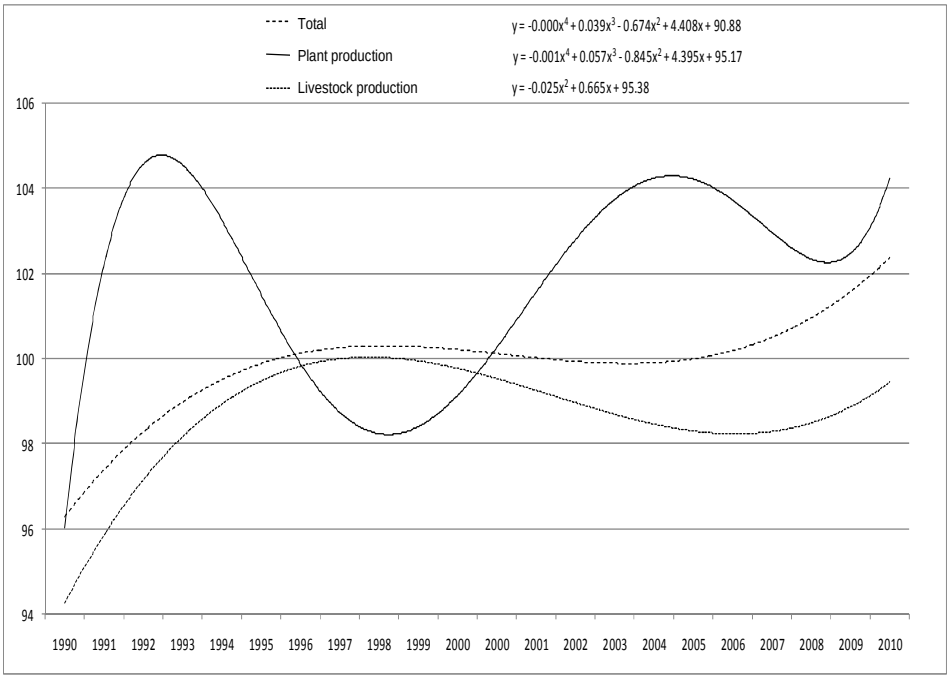

Figure 2: The basic trends of agricultural production, 1990-2010
Source: Processed by the Author.

2. SECTORAL CHARACTERISTICS OF OSCILLATIONS IN PRODUCTION

2.1. Plant production

The biological nature of this production, which is still prevalently conducted within "the factory in the open air", natural factors have a much bigger influence than the anthropogenic ones do, does not enable one to gain an objective picture of the circumstances in plant production from a short-term cut, nor even on the basis of only a few shifting three-year averages of the result achieved. In that sense, it is necessary that a longer-term observation, even one lasting for several decades, should be conducted.

In the last two and a half decades (the base, the 1986-1990 average), and having in view the intention to cast light on the circumstances in production and in the agrarian market prior to and after the so-called "transition", the comparative quantitative analysis of the movements in plant production in Serbia is indicative of the following [5]:

- the production of wheat, as the most important bread grain, is in a continuous decline, so that neither total production itself (due to less sowed areas) nor the average yield, either, reach the pre-transition level, but they are lower by around 20% than they were in the base period;
- corn records positive progress, the areas (although slightly reduced) are stabilized at around 1.2 mill. ha, but the average yield is considerably increased (around 30% higher than in the base period), so total production itself is higher by around 20%;
- in the production of sugar-beet, the areas are drastically reduced (by around 40%), but thanks to an increase in average yields, total production is "only" smaller by around 30% in comparison with the base period;
- sunflower is the only crop to have been produced on the areas somewhat bigger than the ones in the base period, but productivity per unit (the yield), with pronounced oscillations, is on average no higher than the pre-transition level, so that total production as well is on average higher by only around 10% [9];

- in the production of the most important vegetable crops, especially potatoes, which is sown on around 90 thousand ha (of varying) sowing areas, only around the end of the period is a significant increase in the yield recorded, which ensures that total production, too, is higher by around 20%; when it comes to beans, there is a marked falling tendency in the areas and the yield;
- in the production of apples, although there is a recorded increase in the number of fertile trees, production is very unstable, because yields per tree are significantly lower; although there is a continuous decrease in the number of fertile trees, the production of plums as the most significant national fruit still statistically records an increase in the average fruit per tree (by around 30%), as it is the case with total production as well (around 15%);

As a whole, there are rather imbalanced movements in plant production, with positive trends (especially in the production of corn, sunflower and potatoes), there is resource restructuring (smaller areas under wheat, bigger areas under some industrial crops – oleiferous plants), but neither the volume of production nor average productivity per unit in the case of the majority of products have not reached the pre-transition level.

2.2. Livestock production

Differently from plant production, where there is a much more expressed influence of natural factors in comparison with the anthropogenic ones, which essentially prevents an objective image about the circumstances in that production in the short run, the relations between those influences in livestock breeding is very different: intensive production is conducted in a closed or controlled space, there is a bigger inertia of the production cycle, the influence of the man is much bigger. In that sense, even when assessing livestock production, it is also necessary that there be a longer-term observation as well an observation lasting for several decades.

In the last two and a half decades (1985-2010), and according to a comparative quantitative analysis, livestock production in Serbia has been characterized by the most drastic negative "transitional" changes in the overall Serbian agriculture. A radical decrease in the production potential, with significant macro-regional differences, accounts for the following facts: the total number of the heads of cattle has been reduced by 38%; the total number of pigs has been reduced by 20%; the

production of beef has been reduced by 25%; the production of pork has been reduced by 8%; the number of sheep is less by around 30%; the number of poultry, as well as the production of poultry meats and eggs, is less by around 30%; the production of milk stagnates generally speaking, but production per head has significantly increased.

The enormously high "transitional" reduction in the reproductive potential of livestock breeding is obviously intrinsically worrying, even more so because of the role this activity has in the finalization and intensification of total agricultural production, which is considered as the key one for the development of the whole of the reproductive process in the agro-food complex, including domestic consumption and foreign-trade exchange. It is especially clear for one to notice while discussing the balances of the most important agricultural products-foodstuffs in the last decade of the observed period [9]. Such unfavourable long-term trends in livestock breeding can be expected to definitely determine the structure and dynamics of the development of not only the whole of the agricultural and agro-industrial complex but also the profile of the whole of the agrarian and rural development of Serbia in a longer "post-transitional" period.

3. COMPETITION AND THE CHARACTERISTICS OF THE STRUCTURE OF THE AGRARIAN MARKET IN SERBIA

Instability and high oscillations in the production of primary agricultural products have as a consequence also reflected on the total agrarian market, a lack of organization and a number of manifestations of its imperfection. That is a market with an undeveloped competition policy, "broken" ownership and contractual relationships of primary production, processing and trade, a high share of the "grey" economy, insecure buy-sell contracts [8]. These are also the basic barriers, i.e. limitations, to the development of agricultural production and the growth of export, as well as to the stability of production prices and the lowering of relatively high consumer prices of agricultural products.

The basic typical characteristics of the market of agricultural products in Serbia, which is basically characterized by a structure of the absolute competition of offer and the most frequently monopolized (oligopsonistic, to speak more correctly) structure of demand, could be classified into the following several groups.

3.1. Competition of Offer/Producers

A certain number of the markets of agricultural products – the markets of livestock, fruits, vegetables, eggs – could represent the markets of perfect (or at least high) competition; their inefficiency is reflected in a high degree of the "grey" economy, the absence of an organized purchase and contractual relatedness between primary producers and processors. So, the offer of agricultural products is characterized by: (a) the subsistence occasional character of offer – a large number of petty agricultural producers on the offer side; producers with small estates, unfavourable age and educational structures and small economic forces, are characterized by subsistent or semi-subsistent production (small and insecure market surpluses), a small possibility of investing in the construction and expansion of the storage and processing capacities (cold-storage plants, curing houses, silos), in increasing production, the introduction and certification of the security system and the food quality system; (b) disunited market offer –insufficiently organized agricultural producers through their associations and cooperatives; from what is previously said, it follows that a big number of producers have no sufficient own production for the needs of "big buyers" and simultaneously have big demand and the possibilities of placement in the local market which have been made more difficult; (c) internal producer competition – in small local and regional markets, there is a monopsonistic/oligopsonistic structure of demand, personified in one or no more than several buyers (purchasers), merchants or processors. In such conditions, on the other side, there is an offer by a large number of petty producers, who compete with each other fighting for a small space where they can sell their products (raw materials). So, apart from monopsonistic buyers' "blackmails", and competing with each other, producers find themselves in such a position that they have to lower the prices of their products which are not suitable for being transported and stored (e.g. livestock, soft fruits and so forth).

3.2. The Oligopsonistic Structure of Processing

The majority of markets of primary agricultural products (first of all wheat, sunflower, soya, sugar-beet, milk, tobacco) are dominated by a small number of processors, i.e. buyers of agricultural products (an oligopsony), who have a common market share and an influence on the conditions of purchase and the formation of purchase prices not only with respect to agricultural products as raw materials but also on the

prices of final products;[62] the purchase and processing market is characterized by a marked imbalance in the economic power of a small number of the major purchasers (dairies, oil works, sugar factories, cold-storage plants), on the one hand, and a large number of primary producers, on the other; an oligopsony in this market is almost impossible to avoid, given the dispersion of offer, demanding storing conditions or the necessity of industrial processing, a rather difficult possibility of placement, especially export, highly set technological requirements of production, standards in the security system and the food quality system; an oligopsony can be beneficial when it ensures the long-term contractual relatedness between producers and processors (by which agriculturalists reduce the market risk), when it contributes to the enhancement of quality and the introduction of standards in agricultural production and so on; what is crucial, however, is the fact that the state, due to undeveloped institutions, has no possibility of sanctioning the behaviour of those participants who abuse their market position or threaten the competition by disobeying contracts, carrying out transactions in the "grey economy" and so forth.

3.3. The Oligopsony of Trade, Especially of Hypermarkets

An oligopsony is also present when we speak about agriculturalists' placement in hypermarkets; only those few agricultural producers with big production possibilities, then organized and successful cooperatives, associations and so on can count on this market; the development of hypermarkets is suitable for the establishment of contractual and long-term cooperation with producers, the implementation and certification of standards in production, and other advantages related to trade modernization; in this case as well, an oligopsony in the retail market is impossible to avoid, because of the small domestic market, the globalization of the retail market, the increasingly pronounced concentration of retail; however, it is evident that there is a big negotiating power of trade chains against their suppliers, in this particular case – agricultural producers (conditioning the producer with a price, quality, payment deadlines, imposed packaging standards etc.);

[62] There are only three factories dominating in the production of oil; there is one company with a dominating market share in the production of milk; seven sugar refineries are owned by only three owners (with a noticeable intention of further concentration), and so on. Therefore, in the last several years, all these processing groups have been exposed to an attentive eye of the Committee for the Protection of Competition.

researches related to this theme are indicative of retail concentration in Serbia and of the domination of big trade enterprises over production ones, which to a certain extent has dimensions of imposing limitations on the competition (a short-term benefit is made by consumers, due to lower prices, and small trade chains, shops as well as producers themselves are the ones to lose) [1]; the strong negotiating power of few trade chains in Serbia is legalized, supported by an explanation that in the world as well "one not only pays to penetrate a trade chain but they also pay for their place on the shelf."

3.4. The Inefficient Competition Protection System

On principle, the Law on the Protection of Competition (2005), which is significantly complied with the EU legislation, regulates ensuring the equality of market players, all this with the aim to give impetus to economic efficiency and the achievement of the economic welfare of the society as a whole. However, the main shortcomings of this system (according to the experiences and views of lawyers, economists, and business people) are: an insufficient number of material-legal norms as well as the absence of the timely or appropriate application of the existing norms in practice, i.e. an inefficient competition protection system. This is best seen on the examples of the two very important segments of the agrarian market, the inefficiency of the competition protection system in the milk market[63], and the protection of

[63] The first example: In mid-2007, on the basis of the sectoral analyses, the Committee for the Protection of Competition initiated a procedure in the milk market and, in the month of January 2008, by a resolution, they established a fact that one company (Danube Foods Group B.V., which is the owner of the five biggest Serbian dairies) had a dominant position in the market of where raw milk was purchased (in the year 2006, they had a 47.4% market share) and that they abused their position when fixing the price, conditions, and the manner of business doing in that market. Subsequently, there were several cycles of appeals-complaints made by milk producers, the judgments brought by the Administrative and Supreme Courts, repeated actions, repeated complaints for the cancellation of the judgments and resolutions, rejections of complaints and the judgment by the Supreme Court of Appeals. Ultimately, the judgment reached by the Administrative Court (in the month of December 2012), rejected the milk producers' complaint, and confirmed the resolution of the Committee for the Protection of Competition in the repeated action (as of August 2012), which determined that there was a breach of competition by having abused the predominant position by the mentioned market participants, which made that resolution irrevocable. As we can see, the whole procedure for the determination of such breach of competition – the abuse of the predominant position, lasted for more than six years, which undoubtedly demonstrates the insufficient efficiency of the whole system of the protection of competition, not only of the work carried out by the Committee but of the work of the legal-judicial system as well.

concentration and monopolies instead of protecting competition in the sugar market[64].

Such abuses of the position and concentration could negatively influence the degree of the domestic competition, while respecting all the positive effects related to the investment of the mentioned companies in the improvement of the technology and productivity of primary agricultural production, product assortment and quality.

3.5. Undeveloped Market Institution

In Serbia, there is no developed market of commodity notes or term market, either, of agricultural products; there is a lack of purchase-distribution centers (where products, primarily fruits and vegetables, are purchased, sorted and packed); nor are there developed farming cooperatives which would take over the function of the more rational and efficient placement and distribution from agricultural producers

[64] The second example: The biggest producer of sugar in Serbia (the "Sunoko" Company of Novi Sad, now the owner of the four Serbian sugar works), submitted (in the month of August 2011) a Declaration of Concentration to the Committee for the Protection of Competition according to the tender for the sale of the majority share package of the second big producer of sugar ("Hellenic Industry SA" from Thessaloniki, the owner of the two Serbian sugar works). After there had initially been a ban imposed on the conducting of such concentration, the withdrawal and the repeated submission of the declaration, the Committee (in the month of February 2013), conditionally approved of the same concentration of the market participants, together with prescribing the so-called measures of structural character (that "Sunoko" alienates one of the two factories, now owned by "Hellenica", deconcentration). Not discussing the criteria of the assessment of the market justification of such a high concentration, also including the possibilities of the formal new owner of the alienated sugar refinery being "within the hand reach" of the "Sunoko" company, it is obvious that this procedure (concentration, then deconcentration) will enable one owner to possess five sugar refineries (out of the total of six active ones), with an at least 65% market share. In no case can that be considered as the protection of competition or as the creation of a competitive market, either. Given the fact that one buyer of the basic raw material for further processing – sugar-beet – will be dictating or will undoubtedly be in a position to influence the prices and conditions of payment, too, such a decision brought by the Committee could be characterized as the protection of monopolies rather than the protection of competition, in two different ways: firstly, by protecting the position of the oligopsony/monopsony of one company of the predominant buyer of a raw material (sugar-beet); secondly, in the second phase of reproduction, that very same company will appear as a monopolist, the predominant buyer of the final product (sugar), with the same possibility of influencing the prices of the output as well as the prices of input products!

(old cooperatives are almost closed, whereas new ones are emerging slowly and are deprived of having any influence on the market structure). There is also another characteristic – irregularity and the "grey market". A big segment of the market of primary agricultural products is in the irregular flows of purchase and payment, which leads to unequal conditions of the competition between the firms which do their business in compliance with the law and those which evade it (improvised purchase points, without minimal technical and sanitary conditions for such purchase, usual cash payments on purchase, a high share of "middlemen", commodities of a suspicious origin and so on). It means that the state does not ensure the consistent application of the law, through the efficient work of inspection organs (veterinary, phytosanitary, agricultural, market, tax, customs).

3.6. Unregulated Trade in the "Green Marketplace"

In comparison with agriculturalists in rural regions, agriculturalists from the peri-urban zones of bigger cities (Belgrade, Novi Sad, Niš, Kragujevac) have greater possibilities of placing their products, given the fact that, even in big consumer centers, there is significant trading taking place at the "green marketplaces". Marketplaces are suitable for producers with small and insecure market surpluses because trading is carried out in cash, without a fiscal bill. Nevertheless, products traded like this are not sufficiently safe because sellers most frequently have no traceable or any certificate whatsoever of the origin and health safety of their products,[65] and for a large part such trading is conducted by the so-called "middlemen". It is estimated that marketplaces have an around 35% share in the total trade and purchase of agricultural products on the Serbian territory. Yet, in spite of an increase in trading goods at the marketplaces, such a growth is smaller than the growth of the trading of agricultural products in organized wholesale and retail. Thus, marketplaces have entered a new stage of the market game in the environment characterized by the expansion of supermarkets.

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[65] Unfortunately, the Law on the Safety of Food [18] does not regulate more closely the trading of agricultural products at marketplaces. There is no mention of trading agricultural products at marketplaces neither in the defining of the terms and meanings of certain expressions used in this law (Article 4), nor in *risk* analysis, nor as *trade of food*, nor as *retail,* nor *as wholesale.* However, there is a special emphasis on *retail* in: shops, supermarkets and mega-markets.

4. GROWTH OF AGRARIAN EXPORT TOGETHER WITH RADICAL STRUCTURAL EXTENSIFICATION

Because of the big internal differences of the production-resource structure, the former uniform Yugoslav market was characterized by intensive inter-republic trade. Due to the controlled prices of agrarian products by the central government, their internal trade was frequently referred to as an example of non-equivalent exchange. All the republics had their foreign trade positions, but the export of the federation was practically the sum of the market surpluses of the agrarian-sufficient republics, in which Serbia had a dominant role. By the violent secession and disintegration of the common state, the balances of the agrarian trade of the former republics and their position in foreign trade essentially changed.

	Export			*Import*		
	1988-1990	*1998-2000*	*2008-2010*	*1988-1990*	*1998-2000*	*2008-2010*
Worth in mill. USD						
a)	12,573.2	5,653.0	9,703.9	15,634.5	10,685.5	18,552.4
b)	1,128.0	838.6	1,581.5	1,374.9	792.2	792.3
Dynamics of changes (Indices, 1988-1990 =100)						
a)	100	45	77	100	68	119
b)	100	74	140	100	58	58
Coverage of import by export, % (Import = 100)						
a)	80.4	52.9	52.3	100	100	100
b)	82.0	105.8	199.6	100	100	100
Share of agrarian export in total export / import (%)						
	8.97	14.84	16.30	8.79	7.41	4.27
Share of Serbia in the total ex-YU market space (%)						
b)	31.75	27.53	17.55	33.67	33.63	20.81
b)	40.27	59.03	36.46	36.51	30.49	11.09

Table 2: The characteristics of the agrarian export and import of Serbia, as per periods from 1988 to 2010. a) total (all the sections of the SITC); b) Section 0-food and live animals

Sources: for the 1988-1990 period [16]; for the other periods [14].

The export potential of the agrocomplex and its significance in the economic structure is most frequently derived from the analysis of the movements of the volume and structure of export and import, i.e. the net balance of the foreign trade of agrarian products. The Serbian agrarian export was also considered to be a big development potential even in the common state, with significant comparative advantages in the closer neighbourhood and the European environment. For that reason,

the relative changes in the agrarian-export position of Serbia should also be viewed in the context of the market structure and the agrarian potentials of the former common and currently new European environment. If we comparatively analyse the market structure and relations in the three status/systemically completely different circumstances during the period lasting for almost two and a half decades (1988-2010), namely: (1) the pre-transition position in the uniform market; (2) the transition period after the disintegration of the common state and (3) the post-transition period of independence.

The source data are processed as the three-year averages of the results achieved at the end of the selected decades. The transition changes in the balances of agrarian trade are comparatively analysed in time (through three sections) and in space (the ex-Yu countries). The sectoral significance of the agrarian market is assessed by the analysis of the share of agrarian trade in total foreign trade, whereas positional changes in the spatial structure of total and agrarian export and import are viewed from the aspect of the relative share in the total trade of the countries of the ex-Yugoslav market.

4.1. The Dynamics and the Coverage of Import by Export

In the years just prior to the beginning of the so-called transition and the disintegration of the uniform Yugoslav market (1988-1990), the worth of the *total export* of Serbia was around 12,573 million USD on average per annum, and the total import was around 15,634 million USD, i.e. import was covered by export with 80%. About twenty years later (2008-2010), the average annual export fell (by 23%) to 9,704 million USD whereas import increased (by 19%) to 18,552 million USD, so that the coverage of import by export fell to merely 52%.

Simultaneously, the average annual worth of *agrarian export* (the agricultural products and foodstuffs from *Section 0* – Food and Live animals) increased from 1, 128 to 1,581 million USD, whereas *agrarian import* was reduced from 1,374 to 792 million USD. The coverage of agrarian import (82% prior to the transition) was radically changed, so that – differently from all the other ex-Yu countries with a situation contrary to this one – the import of food far exceeds the worth of export, with a declining rate of import coverage – Serbia had a convincingly positive agrarian foreign trade balance (its export of food was even twice as big as food import).

The dynamic increase in the agrarian export at the end of the last decade importantly influenced the total trade exchange of Serbia with foreign countries, which is otherwise characterized by a big long-standing imbalance, i.e. a negative balance, which, in the years before the so-called "world economic crisis", had reached over 12 billion USD (2008). The depth of the problem of the economic exchange with foreign countries, as well as the total Serbian economy, is illustrated by the fact that the total negative foreign trade balance exceeds severalfold the worth of the total agrarian export as the "sheet anchor" of the export economy [11].

4.2. The Agrarization of Total Export

Apart from the analysis of the movements of the volume and structure i.e. net-balance of the foreign trade of agrarian products, the sectoral significance of agrarian export and import, i.e. the export potential of the agrocomplex and its place in the economic structure can be derived on the basis of the share of this sector in the structure of the total national foreign trade. In that respect, we can notice the asymmetry of the Serbian foreign trade structure in relation to the ex-Yu environment: total export is relatively the most agrarized (the share of the export of food increased from around 9% of the total export to over 16%), amongst other things because agrarian export and total export moved in the opposite directions (the agrarian one increases, the total one decreases); only in the case of Serbia is the share of agrarian import in total import facing a fall and is far the smallest (4.27%).

The directions of the territorial structural changes of the foreign trade *agrarian* trade, if the whole of the ex-Yu space is observed, account for the fact that Serbia, especially in agrarian *export*, keeps its dominant position, although with a radically changed (extensified) commodity structure, and also at a relatively rather lower level (an increase in the share to around 60% in the mid-period and a fall to around 36% at the end of the period). At the same time, the Croatian share significantly decreases (to 20%), while the Slovenian share increases to the same extent (to 31%). The growth of the relative share of the agrarian export of Montenegro and Macedonia is, for the most part, the consequence of the monocrop culture of their agrarian production and, now, import as well, i.e. the fact that their big share in the former internal inter-republic trade of some products (e.g. wine and tobacco, which then used to be and now

are sold to prevalently the same buyers) has the characteristic feature of export today.

4.3. The Extensification of the Export Structure

The radically different commodity structure of the agrarian export of all the countries on the ex-Yu territory is amongst the most visible changes in the balances of the agrarian trade of the former republics after the disintegration of the uniform market.

The commodity structure of the agrarian export of Serbia is here observed as an expression of its production-resource structure as well as an indicator of the level of its techno-economic development. We can notice that, prior to the beginning of the so-called transition (1988), the leading export products were those from within the field of livestock breeding (bovine cattle, fresh meat, tinned meat) as a more developed segment of total agriculture then.

Twenty years or so later, at the end of the process of reforms and the "promised welfare", we can see that both the agrarian-production and the export structures have reformed themselves by "going backwards". The extensification of agrarian export is obvious (Table 3): there are no livestock products amongst the leading export products, and the main export products are only plant products, mostly raw materials, primarily cereals, as well as sugar and oil.

Rank	*Product*	*Quantity in tons*	*Worth (000$)*	*Worth per Unit $/m*
Serbia, 2010				
1	Corn	1662151	334923	201
2	Fruits	160465	265946	1657
3	Sugar	282057	184691	655
4	Wheat	427179	89552	210
5	Sunflower oil	88222	88152	999
SFR of Yugoslavia, 1988 (Serbia's share in agrarian export 40.3%)				
1	Bovine cattle (bovines)	88253	135859	1539
2	Fresh meat (other than poultry)	35048	112739	3216
3	Tobacco	13758	53045	3855
4	Wine	100907	50585	501
5	Tinned meat	19363	46302	2391

Table 3: The most significant products in the agrarian export of Serbia, ranked according to the worth, 1988 and 2010
Source: [17]; [19]

The changes in the structure of agrarian export can be explained in the following ways: (1) corn, the main cattle feed and consequently the basis of the predominantly livestock export offer of the former state, has reached the top of the list now, while at the same time, domestic livestock production has continuously and in the long run been making steps backwards; (2) the main export products (wheat/flour/bread, oil, sugar) are exactly those which, via controlled prices in internal trade (and therefore frequently marked as an example of non-equivalent inter-republic exchange), used to be the supporting pillar of the policy of maintaining social peace throughout the former state. So, on the one hand, a big part of the former internal (inter-republic) trade was transformed into the export of those products, while on the other, the structural adjustment of production, which would orient itself towards livestock breeding and export on the basis of its available resources, failed to occur.

Actually, an essential question can be asked at this point – Why, with such high production of corn, does Serbia not have an appropriate production and export of meat and milk (but rather exports corn), differently from the agrarian-developed countries (e.g. Denmark and Holland), which do not produce corn but have several times as high the production of meat and milk compared with the actual needs of their domestic markets? So, apart from the production-structural extensification (with a long-term trend of decreasing the share of livestock breeding), Serbia's agriculture is also characterized by the extensification of the structure of foreign trade exchange, together with an increase in the share of raw materials and primary unprocessed products in export, on the one hand, and, on the other, together with an increase in the import of the final products that could be produced from domestic (however exported) raw materials.

From the macroeconomic point of view, the commodity structure of export and the enormous growth of the worth of corn export actually hide the huge opportunity costs of the Serbian agrarian export. These costs could directly and indirectly be quantified via the growth of the import of live animals, meat and processed products (especially pigs and pork), as well as the import of other livestock products (e.g. in the year 2011, 7,049 tons of pork worth 18,017 USD was imported). On the other hand, the opportunity cost of such an export structure could be derived from the potential (unrealized) effects, which would be emerging from the changed structure of the domestic agro-industrial production, which

would be adjusted to a better utilization of domestic available raw-material resources and to the much higher employment of the workforce, oriented towards intensive livestock breeding, processing and export. So, that big hidden cost lies in the unrealized multiplicative production-economic effects of the conversion of domestic raw-material and labour resources in high finalization products.

CONCLUSIONS

Even in the last twenty years or so, the long-term dynamics of the Serbian total agricultural production have been demonstrating exceptional cyclical instability, stagnation or a much slowed-down growth, with significant differences between (a mild growth of) plant production and (continuously declining) livestock production. At the same time, we can also notice an interesting regularity of the alternating current annual increase and fall in these branches of production. Plant production has been growing at an average annual rate of 2.0%, whereas livestock production has been accounting for a continuous decline at an average annual rate of (minus) –1.2%, so that total agricultural production has on average had a very modest growth at a 0.4% annual rate. As a whole, there are rather erratic movements in plant production: there are positive trends in the production of corn, sunflower and potatoes; there has been resource restructuring (smaller areas under wheat, bigger areas under industrial plants); but, neither the volume of production nor the average productivity per unit with the majority of the products reached the pre-transition level. The high "transitional" reduction in the production-reproductive potential of livestock breeding is concerning because of the role of this activity in the finalization and intensification of total agricultural production. The identified unfavourable long-term production trends in agriculture, especially those in livestock breeding, will beyond any doubt determine the profile of the total agrarian and rural development of Serbia in the longer "post-transition" period.

The agricultural product market in Serbia, which is basically characterized by the structure of the complete competition of offer and most frequently the monopolized (oligopsonistic, to be more correct) structure of demand, could be described in the several following typical characteristics:

- *Competition of offer/producers*, which is characterized by: (a) a large number of petty agricultural producers, unfavourable age-educational structures and weak economic forces, semi-subsistent production, a small possibility of investing in the expansion of capacities, food safety and quality; (b) a lack of organization of producers through associations and cooperatives; insufficient production for the needs of "big buyers", and more difficult possibilities of making placements in the local market; (c) internal competition: the oligopsonistic structure of demand against a large number of petty producers, who, while competing with each other, lower the prices of their respective products which are not suitable for being transported and stored.
- *The oligopsonistic structure of processing:* the majority of markets are predominated by a small number of processors, who have an influence on the purchase conditions and the fixing of the prices of not only raw materials but the prices of final products, too; a pronounced disharmony between the economic force of a small number of the biggest purchasers (dairies, oil plants, sugar refineries, cold-storage plants), on the one hand, and a large number of small primary producers, on the other;
- *Trade/hypermarket oligopsony*: a placement in hypermarkets is only available to a small number of producers; the big negotiating power of trade chains in comparison with suppliers-agricultural producers (conditioning with the price, quality, payment deadlines, packaging and so forth), which has dimensions of limiting competition;
- *The inefficient system of the protection of competition:* the regulations on the protection of competition are to a significant extent complied with the EU legislation, on principal regulated ensuring the equality of all participants in the market, in order to stimulate economic efficiency and the achievement of the economic welfare of the society as a whole; in practice, the inefficient system of the protection of competition is best seen on the examples of the two very important segments of the agrarian market: the inefficiency of the system of the protection of competition in the milk market, and the protection of concentration and monopoly (instead of the protection of competition) in the sugar market; (milk producers') abuses of their position and (sugar refineries') concentration can have a negative impact on the degree of domestic competition, irrespective of the positive effects of the investments made by those companies in the improvement of the technology and productivity of primary production and the assortment and quality of products.

- *Unregulated trading at the "green marketplace":* a significant portion (more than one-third of it) of trading agricultural products is done at "green marketplaces", which are suitable for producers with small and insecure market surpluses; products in such trading are not sufficiently safe since sellers have neither a traceable nor any certificate of origin, quality and health safety of their products whatsoever; despite that, the trade of goods at marketplaces is not regulated by the Law on the Safety of Food (2009).

Accompanied by a trend of a nominal increase, the foreign trade exchange of the agro-food sector generally has the characteristics of extensification, i.e. contrary to expectations and proclamations, it has the features of a continuously increasing share of primary products (primarily plant products) against high finalization products. So, apart from the production-structural extensification (with a long-term trend of decreasing the share of livestock breeding), Serbia's agriculture is also characterized by the extensification of the structure of the foreign trade exchange, together with increasing the share of raw materials and primary unprocessed products in export, on the one hand, and on the other, with increasing the import of final products that could be produced from domestic (but exported) raw materials. Therefore, from a macroeconomic point of view, one must bear in mind the fact that an enormous growth of the worth of the export of raw materials actually hides a huge opportunity cost, i.e. a loss in the economic effects of the different utilization of available agrarian resources. Such a macroeconomic cost (of corn export) could directly and indirectly be quantified via the growth of the worth of the import of live animals, meat and processed products (especially pigs and pork) as well as the import of other livestock products and also through the unrealized multiplicative production-economic effects of the conversion of raw materials into high finalization products.

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FOREIGN TRADE EXCHANGE OF AGRO-INDUSTRIAL PRODUCTS OF SERBIA

INTRODUCTION

Export of agricultural products is the basis of development of agriculture, and therefore the economy as a whole, which is why it is of great importance from the standpoint of national economy. Trade with foreign countries is carried out in the framework of the overall development of the economy, which is determined by the economic system and the overall socio-economic relations. Export is conditioned, first of all, by the scope and dynamics of domestic agricultural production, amount of consumption, the level of incentives from the state, as well as customs and other non-tariff restrictions of importing countries. Serbia produces about 10 million tons of agricultural products worth more than five billion dollars (2011) at 4.1 million hectares of arable farmland.

The main objective of this study is to look at exports, imports, regional destination, as well as foreign trade balance of agricultural products of the Republic of Serbia. The aim was also to analyse the factors that led to the demonstrated results, and point to the basic guidelines of expansion of the same in the future.

1. SOURCES OF DATA AND METHODOLOGY OF RESEARCH

The basic source of data is statistical documentation of the Republic Statistical Office – *Commodity exchange with foreign countries per sectors and sections* for the period from 2004 to 2011. The analysis includes sectors of primary agricultural products and products of manufacturing industry, namely sectors of Food and live animals ("0"), Beverages and tobacco ("1"), a part of the sector of Crude materials, inedible, except fuels ("2"), and sector of Animal and vegetable oils, fats, and waxes ("4"), according to the Standard International Trade Classification (SITC). The method of *desk research* was applied in the paper. It is based on the use of available data that were systematised in the paper using standard statistical-mathematical methods.

2. RESEARCH RESULTS

2.1. Export of Agro-Industrial Products from Serbia

An average export of agro-industrial products from the Republic of Serbia during the analysed period made 1.7 billion US dollars. It records significant increase under the average rate of 18.66% per annum with the emphasised variations of up to 38.82%. During the initial year, it made 800 billion dollars only to reach the value of 2.7 billion dollars in the last analysed year. Export per capita makes 375 dollars and almost two thousand dollars per active farmer (2011).

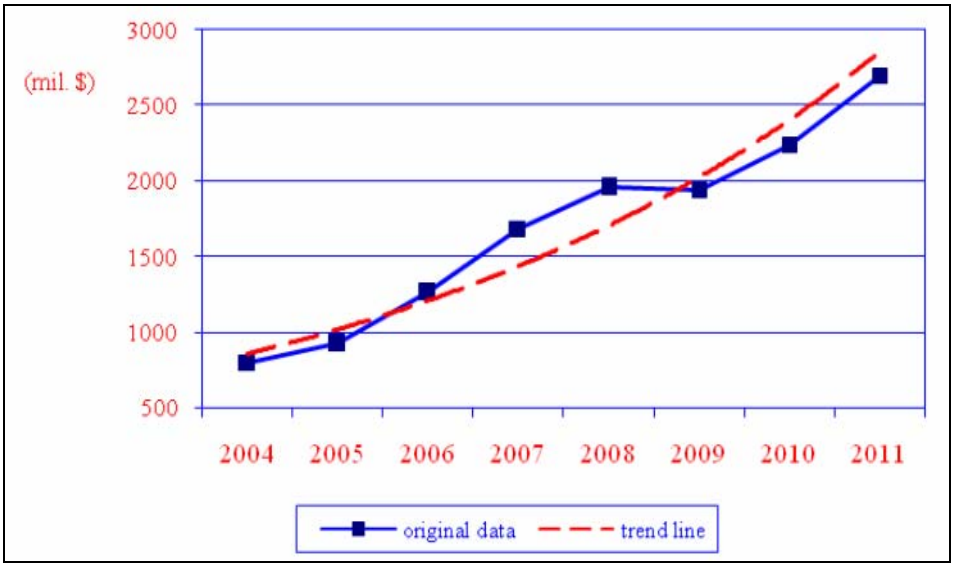

Figure 1: Trends in export of agro-industrial products from the Republic of Serbia (million US dollars)
Source: [12]

There is no doubt that the achieved export results are significant. The reasons are many and they reflect, among other things, the overall state of agro-industry. Favourable results of agro-industry of Serbia in foreign trade were achieved thanks to the benefits of preferential status on the market in the European Union Member States, the achieved liberalisation in trade with the western Balkan countries (CEFTA) and market trends that are still present at the global market [1]. The Republic of Serbia has quite a modest share in the international trade with agro-industrial

products. The structure of the world exports it participates with 0.10%, while its European share accounts for 0.20%. Because of small importance in international trade, it is in a position to adapt to the conditions of the international market, namely it can affect very little the trends and characteristics of the exchange. Agro-industrial products account for 22% in the structure of overall export. Export can be increased considering the potentials present in agro-industry (land, human resources, agro-ecological conditions, processing industry, etc.) and current situation atthe international market. The factors that determine export can be divided into two groups:

a) External (macroeconomic factors) – factors of the international environment:

- The closed nature of certain markets - regional economic groups (EU, NAFTA, ASEAN, APEC, etc.). They significantly restrict the import from the so-called "third" countries.
- The existence of significant barriers in export - in the form of technical barriers, such as ISO and HACCP standards, and quantitative, customs and other restrictions as the primary measures of agricultural protectionism (quotas, quantitative restrictions, technical barriers, etc.).
- Serbia is not a member of the World Trade Organization - this reduces its competitiveness on the basis of higher prices based on higher customs duties. It should, however, be noted that WTO membership requires either abolishing of import and export quotas or, where it is possible to apply them as an exception under certain conditions, bringing them in line with the international rules and subjecting their implementation to international supervision.

b) Internal – factors of domestic environment:

- Primary agriculture is in a bad economic situation - it is currently not in the position to increase production more seriously and thus create the quality quantities of products for export.
- Lack of long-term, consistent, and clearly defined export policy - in the field of agriculture and food industry. Namely, the lack of long-term export strategy in relation to current and potential competitors.

- Relatively low labour productivity in agriculture and food industry - export is price and quality non-competitive at the international market.
- Lack of operating capital – necessary to increase primary agricultural production, and preparation of export and import. This is a chronic shortage of domestic agro-industry, which is an important limiting factor of exports.
- Low level of incentives for export of agricultural and food products – therefore, our products, as by the rule, are not cost-competitive at the international market. Incentives will have to be abolished along with the accession into the WTO.
- Relatively poor organisation of appearance at the international market. Insufficient organisation and flexibility in the performance of companies and conquering of new markets.
- Present oscillations in the quality of export products - this destroys the acquired reputation of our country, etc. (bad examples are plum brandy, raspberry, etc.).

2.1.1. Export of Agro-Industrial Products per Commodity Groups and Sectors

The export structure is dominated by the commodity sector of Food and live animals ("0") with an average value of 1,337 million dollars, accounting for 79.1% of share and with a significant growth trend under the rate of 17.44%. The analysis of the structure of export of the above-mentioned sector indicates that section of Vegetables and fruit is the most important with the average export of the 427 million dollars that accounts for a quarter (25.3%) of the total export, namely that it has the dominant share. Export of Vegetables and fruit recorded significant growth trend under the rate of 14.8%. In the structure of export, this section is followed by cereals and cereal preparations with the value of 384 million dollars, namely the share of 22.7%. Export of cereals recorded a remarkable growth rate of 28.3%. The following in a line is the section of Sugars, sugar preparations and honey with 177 million and the share of 10.5%. This section recorded a moderate export growth rate of 3.1%. The above-mentioned sections have the dominant position in the export of agricultural products of the Republic of Serbia with more than half of share (58.5%).

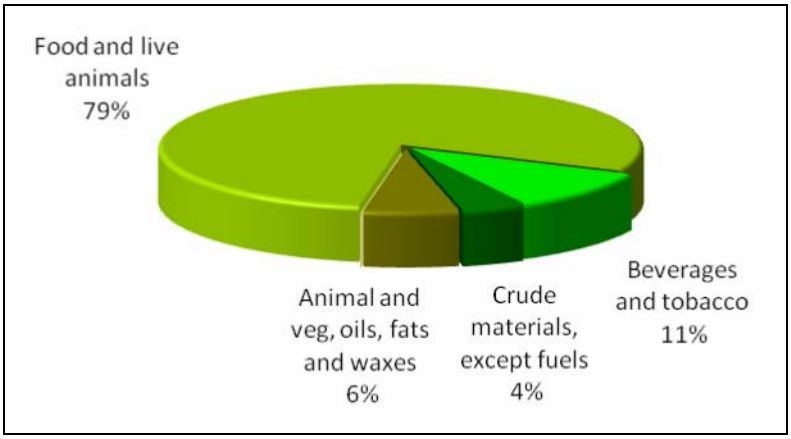

Figure 2: Structure of export of agro-industrial products per commodity sectors from Serbia (2004-2011), in %
Source: [12]

We can also notice a relatively small share of meat and meat preparations with the average export of only 62 million dollars, namely with the share of 3.7%. The reasons for such more than a modest export can be found, primarily, in the crisis of the cattle breeding production, which has been manifested by the reduced overall meat production. In addition, there was also the impact of relatively high production costs, as well as of exceptional competition at the international market, which resulted with reduced competitiveness. All commodity sections within the analysed commodity group record the growth trend when it comes to export. The most intensive growth was recorded by the commodity section of live animals with the rate of 82.17%. The increase of growth is encouraging and it may represent an important driving engine of agrarian production in the Republic of Serbia.

The second place belongs to the commodity sector of beverages and tobacco("1") with the average value of 175 million dollars, the share of 10.4%, and significant growth trend under the rate of 28.5%. The analysis of the export structure of the above-mentioned sector shows that most important export section is the one of Beverages with the average export of 142 million dollars that accounts for 8.4% of the total export, namely the dominant share. Export records a significant growth trend under the rate of 25.4%. Export of tobacco and tobacco manufactures is significantly smaller and it amounts to 34 million dollars with the share of 2% (Tab. 1).

Sector/Section	*Average value (mill. $)*	*Share (%)*	*Change rate (%)*	*CV (%)*
Export-total	**1,690**	**100.0**	**18.66**	**38.82**
Food and live animals	**1,337**	**79.1**	**17.44**	**36.59**
Live animals	35	2.1	82.17	90.53
Meat and meat preparations	62	3.7	11.32	40.38
Dairy products and birds' eggs	51	3.0	37.61	56.26
Fish (not marine mammals), crustaceans, molluscs and aquatic invertebrates, and preparations thereof	4	0.2	27.56	52.30
Cereals and cereal preparations	384	22.7	28.29	53.63
Vegetables and fruit	427	25.3	14.76	33.22
Sugars, sugar preparations and honey	177	10.5	3.06	10.14
Coffee, tea, cocoa, spices, and manufactures thereof	69	4.1	12.31	27.49
Feeding stuff for animals (not including unmilled cereals)	54	3.2	28.31	54.92
Miscellaneous edible products and preparations	73	4.3	14.21	30.40
Beverages and tobacco	**175**	**10.4**	**28.46**	**51.15**
Beverages	142	8.4	25.42	47.65
Tobacco and tobacco manufactures	34	2.0	46.50	68.20
Crude materials, except fuels	**71**	**4.2**	**15.65**	**41.63**
Hides, skins and furskins, raw	22	1.3	9.66	34.92
Oil-seeds and oleaginous fruits	25	1.5	29.89	72.64
Crude animal and vegetable materials, n.e.s.	24	1.4	8.47	21.62
Animal and vegetable oils, fats and waxes	**106**	**6.3**	**25.33**	**55.42**
Animal oils and fats	2	0.1	22.52	54.19
Fixed vegetable fats and oils, crude, refined or fractionated	99	5.8	26.85	57.45
Animal or vegetable fats and oils, processed	6	0.4	7.57	32.12

Table 1: Export of agro-industrial products from Serbia (2004-2011), million US dollars
Source: [12]

Export of the commodity sector of **Animal and vegetable oils, fats and waxes** ("4") made 106 million dollars on the average, with the share of 6.3% in the overall export. It achieved a significant increase under the rate of 25.3% per annum. Within the above-mentioned commodity sector, the dominant share belongs to the commodity section of Crude animal and vegetable materials with the value of 99 million dollars and the share of 5.8% in the total export. Export recorded a significant growth rate trend of 26.8% per annum. Other commodity sectors have negligible small share.

The minimum share in export belongs to a part of the commodity sector of Crude **materials, except fuels** ("2") with the average value of 71 million dollars and the share of 4.2% in the overall export. It achieved the growth rate trend of 16.6% per annum. Three commodity sections have an equal share within this commodity sector. The largest share belongs to the commodity section of Oil-seeds and oleaginous fruits with the value of 25 million dollars and the share of 1.5% in the total export. Export recorded a significant growth rate trend of 29.9% per annum. Other commodity sectors have a slightly smaller share but with a significantly lower export growth rates.

It may be noted that the export concentration coefficient is relatively low, similar to the majority of countries in the region. That does not describe a broad range of our export economy and its favourable structure but, above all, the lack of competitive products. There are only a few commodity groups that have a significant share, and that, as a rule, refers to products of lower finalisation phase (fruit, wheat, corn, fresh fruit, sugar ...), etc. [2].

2.1.2. Regional Determination of Export of Agro-Industrial Products

The analysis of regional determinants of export of agro-industrial products shows that the highest value of export is oriented towards the European Union Member States since it amounts to 799 million dollars, which accounts for almost a half of the total export (47.3%). During the analysed period, export has grown from 428 million dollars during the first year to 1.3 billion during the last year, namely under the intensive annual rate of 17.17%. The European Union represents the most important market for the Republic of Serbia. The most important section

in the structure of export include Vegetables and fruit that amounts to 298 million dollars on the average and accounts for more than a third (37.3%) of the total export into the above-mentioned economic group. It is followed by Cereals and cereal preparations with 183 million dollars (22.9%), and Sugars, sugar preparations, and honey with 155 million dollars (19.4%). The commodity section of Fixed vegetable fats and oils, crude, refined or fractionated with 56 million dollars and the share of 7% is also significant.

European Union is the most important economic regional group of countries with the dominant impact at the international market of agricultural-food products. International trade of Serbia with the above-mentioned group of countries is carried out within highly complex economic as well as political conditions. Our economic linking is necessary since it represents the condition for faster development and inclusion into international trade [3].

The Stabilisation and Association Agreement (SAA) and Interim Trade Agreement (ITA) as a part of SAA regulating the issues of mutual trade were signed in 2007. In 2008, the National Parliament of the Republic of Serbia ratified both Agreements. Since February 1st, 2009, the Council of the European Union passed the Decision that the European Union shall commence with the bilateral implementation of the ITA on a temporary basis while the Agreement came officially into force on February 1st, 2010. The process of ratification of the Stabilisation and Association Agreement (SAA) in the EU Member States started by the middle of 2010 [4]. The European Union abolished customs duties and fees as of the date of coming of the Agreement into force with the same effect on import of agricultural products originating from Serbia, except for import of live bull calves and young beef (covered within the tariff numbers 0102, 0201, and 0202 of the combined nomenclature), sugar (tariff numbers 1701, and 1702), and wine (tariff number 2204), while customs duties and levies charged on import of products covered by tariff heads 07 (vegetables) and 08 (fruit) are abolished so that only ad valorem customs rate is kept for the same (Art. 11 of the ITA). Customs duties on import of agricultural products from Serbia into the EU contained in the Annex I to the Protocol 1 of the Agreement have been set at a zero level [5].

Since preferential access to a certain market was first granted to Serbian products, Serbia has achieved significant growth rates of foreign trade. This has resulted with an increase in the indicators of openness of

domestic economy, which indicates the possibility of a country to make use of its comparative advantages. According to the value of this coefficient, Serbia is worst ranked in the region, and thus it can be concluded that it is necessary to achieve a higher degree of openness to encourage specialisation and economies of scale and also facilitate access to contemporary technologies through foreign direct investments, which are undoubtedly important for the development of the country [6]. Therefore, the SAA that was signed and ratified affected significantly the export of agro-industrial products from of Serbia. Higher export of agro-industrial products to the EU market requires the achieving of compliance with a series of horizontal and vertical rules contained in the EU Directives.

With the implementation of the Interim Trade Agreement, Serbia got a possibility of diagonal accumulation of origin of goods in trade with the EU, with the countries of the CEFTA region, Turkey and the EFTA countries (Norway, Switzerland, Iceland, and Lichtenstein), which represents a new impulse to the development of trade and investments in the region.

Slightly lower exports is directed to the countries of the CEFTA group (Bosnia and Herzegovina, Croatia, FYR Macedonia, Montenegro, Albania, Moldova, and UNMIK - Kosovo), and it amounts to 761 million, or 45% of share. Export to the above-mentioned economic group grows more intensively as compared to the European Union (19.91%). During the analysed period, export has increased from 315 million dollars in its initial, to 1.1 billion in the last year. CEFTA agreement was concluded on November 9th, and signed on December 19th, 2006. All countries have ratified and they implement the Agreement. For Albania, Montenegro, FYR Macedonia, Moldova, and UNMIK, the Agreement entered into force on July 26th, 2007. For Croatia, it entered into force on August 22nd, for Serbia on October 24th, and for and Bosnia and Herzegovina on November 22nd, 2007. The implementation of CEFTA in 2006 and the creation of a free trade zone in the Region, should provide significant advantages for signatory countries individually and the region as a whole. The main function of the CEFTA Agreement relates primarily to acceleration of the process of accession to the WTO and the EU. The economic advantages are reflected in the opportunities brought about by free trade liberalisation: free movement of people, goods and capital, a multiple increase in trade exchange, harmonisation of economic development,

creation of a much larger market, raising the production co-operation onto a higher level, etc. [7]. Most important section in the structure of export is the section of Cereals and cereal preparations with the value of 186 million dollars, accounting for almost a quarter (24.43%) of the total export to the above-mentioned economic group. It is followed by Beverages with126 million dollars (16.6%) and Vegetables and fruit with 58 million dollars (7.6%). Meat and meat preparations with 53 million dollars and the share of 6.9% are also an important commodity section.

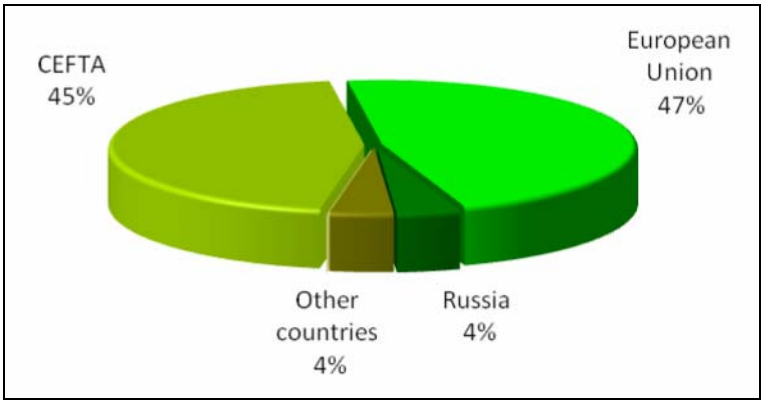

Figure 3: Region determination of export of agro-industrial products from Serbia (2004-2011), %
Source: [12]

In designing the strategy of export to the international market, the advantage should be given to the European countries. In this respect, the co-operation should be established with the Balkan countries that we are linked with based on several decades' long orientation and compatibility of economies of countries of the former SFRY [8]. If economic co-operation with the countries of former SFRY gets recovered under a faster pace, the increase of our export could be expected. As the global market is still relatively closed, many domestic manufacturers see their perspective in export at these markets. This confirms the fact of previous mutual entanglement of production within the former Yugoslavia. [9]

The achieved export to the Russian Federation is far behind the above-mentioned group, and it amounts 69 million dollars on the average, which represents only 4.1% of the total export. Export to the above-mentioned country has recorded the most dynamic growth in relation to others at a rate of 39.42%. In the first year, it was 16 million, and in the last year, it reached 165 million dollars. Most important section in the structure of

exports is the section of Vegetables and fruit with 52 million dollars, accounting for three-quarters (75.7%) of the total export to that country. It is followed by Cereals and cereal preparations with 3.8 million dollars (5.5%) and Miscellaneous edible products, with 3.1 million dollars (4.5%). Crude animal and vegetable materials are also significant commodity section with 2.4 million dollars and the share of 3.5%. The Free Trade Agreement between Russia and Serbia (formerly FRY) was signed on August 28th, 2000. According to it, most of the goods are exempt from customs duties that used to account for around 25% on Serbian goods. Serbia is the only country in Europe, apart from some members of the Commonwealth of Independent States, which has signed a Free Trade Agreement with Russia. In accordance with the WTO principles, the Agreement stipulates that customs duty amounting to 1% is charged to the goods for which it can be shown they originate from Serbia (which have more than 50% of the content from Serbia) when destined for the Russian market.

Export that is directed to other countries amounts to 61 million dollars, which represents only 3.6% of the total export from the Republic of Serbia.

Analysed by countries, the largest export is directed to Bosnia and Herzegovina, which absorbed the agro-industrial products valued at 337 million dollars, and the share of 19.9% (*Histogram 1*). The main commodity sections are: Cereals and cereal preparations, accounting for one-third of share, and Beverages that account for one-quarter of share. The major export items are beer, corn, biscuits, and wafers. With the above-mentioned country, there is a Free Trade Agreement that has been in force since June 1st, 2002, while full liberalisation has been implemented since April 1st, 2004 taking into account that BiH introduced unilaterally on that date various restrictions on import of certain agricultural and food products from Serbia.

The second most important export partner is Montenegro with 312 million dollars, or the share of 18.5%. The main commodity sections are Beverages, and Cereals and cereal preparations. The most important export products are mineral water, flour, biscuits, and wafers. The third place is occupied by the FYR Macedonia with 129 million dollars, namely the share of 7.6%. The most significant commodity sections are Cereals and cereal preparations, and Meat and meat preparations. The Trade Agreement with the FYR Macedonia was signed in 1996, and by

the end of 2005, it was transformed into a Free Trade Agreement, and as such, it has been in force since January 1st, 2006. Germany is at the fourth place with almost identical export as the FYR Macedonia of 129 million dollars. The main commodity sections as Vegetables and fruit, and Cereals and cereal preparations. Germany has traditionally been an important partner in the export of Serbian agro-industrial products. Italy is at the fifth place with 119 million dollars and the share of 7%. The main commodity sections are Sugars, sugar preparations and honey, and Vegetables and fruit.

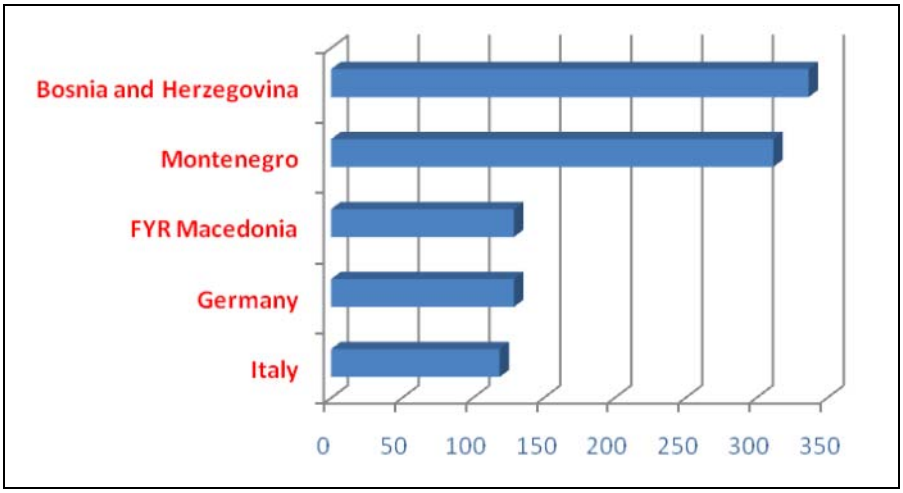

Figure 4: Countries to which the largest export of agro-industrial products from Serbia is recorded (million US dollars), 2004-2011
Source: [12]

The first five countries in the structure of export dominate with the share of 60.7%. Important partners are also Hungary, Greece, Croatia, and Russia. Other countries have absorbed almost 40% of the total export. In 2009, the Republic of Serbia signed a Free Trade Agreement with the European Free Trade Association (EFTA), the members of which are Island, Lichtenstein, Norway, and Switzerland. The Agreement, which was adopted at the Ministerial Conference of EFTA came into force in April 2010, will enable export of Serbian products to the above-mentioned market without customs duties once it gets ratified by the Parliament of the Republic of Serbia. Our products have to be competitive in terms of prices, quality, and range compared to food manufacturers from other countries. This implies export, market oriented, profitable, production programmes [3].

2.1.3. Export Expansion Factors

It is necessary to promote the increase of production that will be export oriented, in accordance with the needs of concrete market segments. An important attention should be paid to production of healthy safe, ecologically clean food for which we have the potentials and which has its buyers in the most developed countries of the European Union. The precondition for this, among other things, is to conduct the research of foreign markets in the fields of demand, amount of the consumers' income, activities of competition, etc. It is necessary to work continuously on the acceptance of our country in all important international institutions, in particular the WTO since it will significantly improve and enhance overall export. It is necessary for export product to be adapted to the standards of the importing countries, primarily of the European Union, and, at the same time, to adapt the export policy so that the protectionism in agriculture becomes less emphasised. For the purpose of fastest possible return of agricultural products onto the world market all the activities aimed at that goal can be classified in three levels: state level, level of diverse associations (chambers, business associations), and level of companies (economic entities).

Measures of economic policy in this field need to observe all specific characteristics of agricultural production (slow capital return, etc.). At the same time, they need to be in the function of support to its export orientation. It is necessary to implement appropriate measures to increase and stabilise production and create in such a way stable export surpluses, which will satisfy the needs of foreign buyers in that respect. This is not an easy task, but it is a necessary one if we wish to emerge onto the international market. That requires a marketing approach to export, which implies satisfying of the needs of foreign consumers, with fulfilment of positive financial results and implementation and optimum combining of all marketing MIX instruments.

Aiming at increasing export it is necessary to upgrade our agriculture and food industry, change the behaviour and opinions of economic entities in agro-industry. Adapting to the norms and standards of the importing countries and implementation of the marketing concept of doing business make the imperatives. Production has to be directed toward the needs of consumers in certain countries. In addition, it is necessary to design the export policy in the way that measures of agricultural protectionism

are less expressed. Special attention should be paid to increasing productivity, competitiveness, and education of agricultural producers [10].

2.2. Import of Agro-Industrial Products of Serbia

The average import of agro-industrial products of Serbia during the analysed period amounted to 1,108 million US dollars. Import has recorded growth at the rate of 7.80%, with annual variations of 23.6%. During the first year of the analysed period import amounted to 856 million US dollars, only to achieve the value of 1.4 billion dollars during the last analysed year. It is evident that the import rate is far lower than the export rate. Global characteristic of import is the fact that it has been carried out in a quite uncontrolled and chaotic way, which was largely the result of a relatively high level of liberalisation. Therefore, it can be concluded that protection of our agriculture and food industry from competition from abroad is exceptionally poor. Liberalisation of import represents one of necessary steps aimed at approximation of our country to the rules valid within the World Trade Organisation. More expressed liberalisation would result with tightening of competition and increasing of the product assortment at the domestic market. However, the fact is that our economic entities in agro-industry are not ready yet to face a strong competition from abroad.

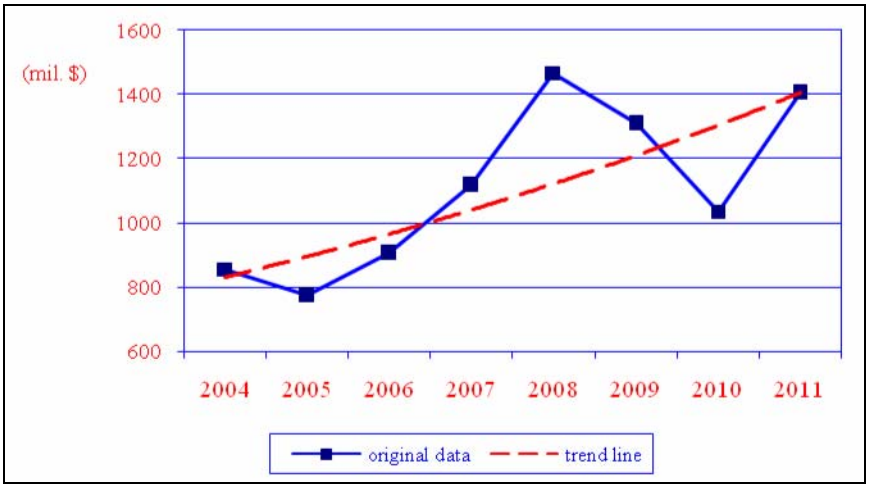

Figure 5: Trends in import of agro-industrial products of Serbia (million US dollars)
Source: [12]

2.2.1. Import of Agro-Industrial Products by Commodity Groups and Sections

The commodity sector of **Food and live animals** ("0") in the structure of import. Its average value amounted to 824 million dollars with the share of almost three quarters (74.3%) and the growth trend at the rate of 7.97%. The analysis of the structure of import of the above-mentioned sector shows that most important commodity section is the section of Vegetables and fruit with the average import of 240 million dollars and the share of 21.6% of the total import, namely the dominant share. Import of Vegetables and fruit has recorded the growth trend at the rate of 10.46%.

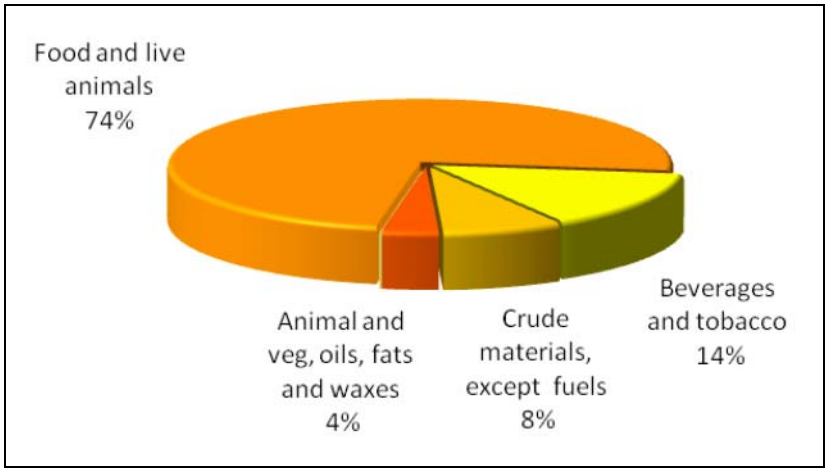

Figure 6: Structure of import of agro-industrial products of Serbia (2004-2011), %
Source: [12]

It is followed by the section of Coffee, tea, cocoa, spices, and manufactures thereof with the value of 167 million dollars, namely with the share of 15.1%. Import of the above-mentioned section has recorded growth at the rate of 8.46%. This section is followed by the section of Miscellaneous edible products with 104 million dollars and the share of 9.4%. It has recorded a moderate growth at the rate of 4.93%. The share of the commodity section of Fish and fish preparations is also important with 76 million dollars and the share of 6.9%.It is logical since

Serbia has to import marine fish. The above-mentioned sections have the dominant share in the structure of import of agro-industrial products with the share of 53%. All commodity sections within the analysed commodity group, except for feedstuff for animals, have recorded the growth trend in import. The most intensive growth has been recorded by the commodity section of Meat and meat preparations, which has been growing at the rate of 23.20%.

The second place belongs to the commodity sector of **Beverages and tobacco** ("1") with the average value of 160 million dollars and the share of 14.4%, namely a moderate growth trend at the rate of 2.51%. The analysis of the structure of import of the above-mentioned sector shows that the most important section is the section of Tobacco and tobacco manufactures with the average import of 96 million dollars, which accounts for 8.7% of the total import, namely the dominant share. Import has recorder a declining trend at the rate of 1.81%. Import of Beverages is significantly lower – it amounted to 64 million dollars with the share of 5.8% (Tab.2).

Average import of the commodity sector of **Crude materials, except fuels** ("2") amounted to 85 million dollars with the share of 7.7% in the overall export. It recorded the growth rate of 15.23% per annum. The largest share within this commodity sector belongs to Crude animal and vegetable materials with the value of 41 million dollars and the share of 3.7% of the total import. Import records a rising trend rate of 5.8% per annum. Other commodity sectors have lower share but with significantly higher import growth rates.

The smallest share in the structure of import belongs to the sector of **Animal and vegetable oils, fats and waxes** ("4") that amounted to 39 million dollars on the average and had the share of 3.6% in the overall import. It recorded the growth rate of 13.7% per annum. Within this sector, the dominant share belongs to the commodity section of Fixed vegetable fats and oils, crude, refined or fractionated with the value of 30 million dollars and the share of 2.7% in the total import. Import recorded a significant growth rate of 17.25% per annum. Other commodity sectors have negligible share.

Sector/Section	*Average value (mill. $)*	*Share (%)*	*Change rate (%)*	*CV (%)*
Export-total	**1.108**	**100.0**	**7.80**	**23.60**
Food and live animals	**824**	**74.3**	**7.97**	**24.14**
Live animals	11	1.0	15.58	57.79
Meat and meat preparations	34	3.1	23.20	50.90
Dairy products and birds' eggs	29	2.6	23.05	56.12
Fish (not marine mammals), crustaceans, molluscs and aquatic invertebrates, and preparations thereof	76	6.9	9.04	28.32
Cereals and cereal preparations	68	6.1	3.43	25.17
Vegetables and fruit	240	21.6	10.79	28.18
Sugars, sugar preparations and honey	38	3.5	0.37	20.00
Coffee, tea, cocoa, spices, and manufactures thereof	167	15.1	8.46	24.20
Feeding stuff for animals (not including unmilled cereals)	56	5.0	-3.63	20.55
Miscellaneous edible products and preparations	104	9.4	4.93	19.74
Beverages and tobacco	**160**	**14.4**	**2.51**	**19.30**
Beverages	64	5.8	11.62	34.57
Tobacco and tobacco manufactures	96	8.7	-1.81	20.92
Crude materials, except fuels	**85**	**7.7**	**15.23**	**36.26**
Hides, skins and furskins, raw	8	0.7	47.43	99.91
Oil-seeds and oleaginous fruits	36	3.3	21.35	50.46
Crude animal and vegetable materials, n.e.s.	41	3.7	5.85	24.15
Animal and vegetable oils, fats and waxes	**39**	**3.6**	**13.66**	**36.30**
Animal oils and fats	3	0.3	23.62	55.46
Fixed vegetable fats and oils, crude, refined or fractionated	30	2.7	17.25	40.66
Animal or vegetable fats and oils, processed	6	0.6	-2.01	24.28

Table 2: Import of agro-industrial products of Serbia (2004-2011), million US dollars
Source: [12]

2.2.2. Regional Origin of Import of Agro-Industrial Products

The analysis of regional destination of agro-industrial products shows that the highest value comes from the European Union Member States, i.e. 464 million dollars on the average, which accounts for almost a half of the total import (41.9%). During the analysed period, export has grown from 383 million dollars during the initial year to 635 million dollars in

the last analysed year, namely it has grown under the rate of 6.12%. A good thing is that import intensity is far more moderate than export of agro-industrial products. The most important sections in the structure of import include Vegetables and fruit that amounts to 77 million dollars and accounts for 16.7% of the total import. Citrus fruits are the dominant in this section. Import of apples is exceptionally high. This is followed by Miscellaneous edible products with 72 million dollars (15.6%), and Coffee, tea, cocoa, spices, and manufactures thereof with 47 million dollars (10.1%). Tobacco and tobacco manufactures represent a significant commodity section with 35 million dollars and the share of 7.4%. The above-mentioned sections dominate in the structure of import with the share of almost a half (49.8%) of the total import.

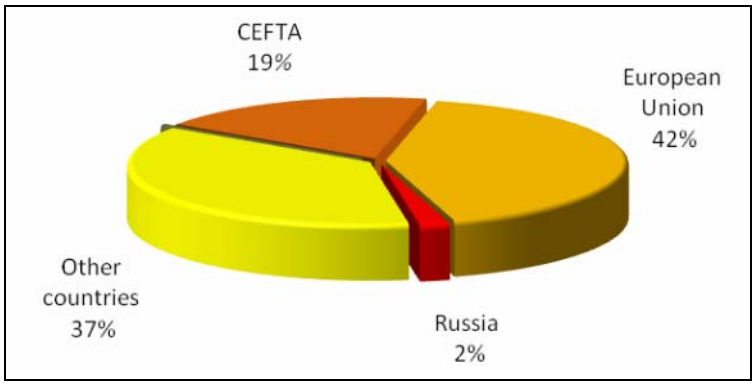

Figure 7: Regional origin of export of agro-industrial products of Serbia (2004-2011), %
Source: [12]

Having concluded the Stabilisation and Association Agreement with the EU, the Republic of Serbia has undertaken the obligation to reduced the current level of import protection in the sector of agriculture by 50% until the end of transition period, namely to bring it closer to zero at the moment of accession into the EU, with keeping of the support for a limited number of most vulnerable products within the agreed period and after the accession. The Stabilisation and Association Agreement with the EU, namely the Interim Trade Agreement anticipates the lifting of quantity limitations, progressive abolishing, and reducing of customs duties on import of agricultural products originating from the EU from the date of coming of the Agreement into force, in accordance with the dynamics stated for each product in Annexes to the Agreement. As of the date of coming of the Agreement into force, Serbia will abolish

all quantity restrictions and customs on import of Fish (not marine mammals), crustaceans, molluscs and aquatic invertebrates, and preparations thereof originating from the EU, except for those referred to in Annex V. However, a large number of tariff lines that include products of agriculture and fishing are of special significance for Serbian agriculture and that belong to the sections of Live animals, Meat and meat preparations, Milk, Dairy products and birds' eggs, Honey, Cereals, Flour and pastry, Soybean oil, Fruit, Vegetables and preparations thereof, Fruit juices, some sugar syrups, Fermented beverages and vinegar will maintain the customs protection at a certain, reduced level even after the implementation period (fresh tomato and sweet paprika, fresh will keep the reduced customs rate along with the seasonal rate, while fresh grapes, apples, sour cherries, plums, and strawberries will keep only the seasonal rate), as well as carp and pastry containing fish and marine preparations exceeding 20% when it comes to fish preparations.

Import from the countries of the CEFTA group amounted to 213 million dollars, which made 19.2% of the total import, namely it was significantly lower compared to import from the European Union (Fig. 7). It is evident that import from the CEFTA countries grows more intensively compared to import from the European Union (18.7%). During the analysed period, import has grown from 96 million dollars during the first year to 317 million dollars during the last analysed year.

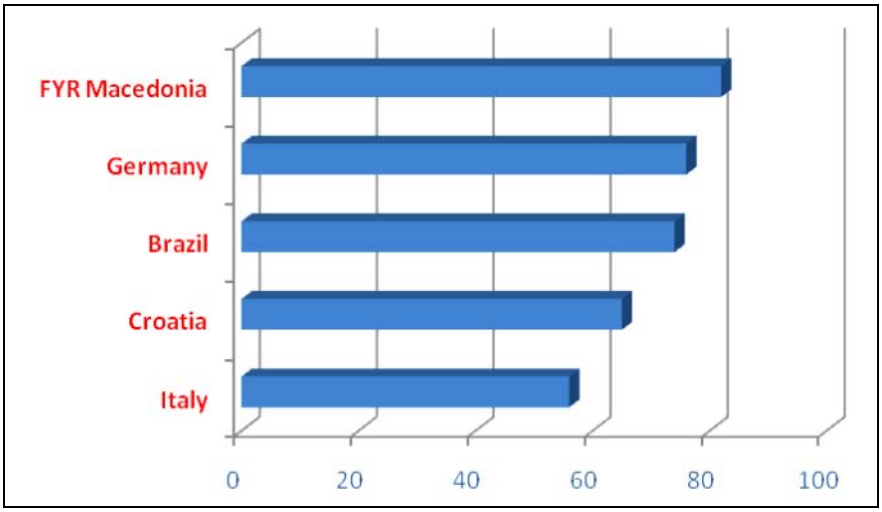

Figure 8: Countries from which the largest import of agro-industrial products into Serbia is recorded (million US dollars), 2004-2011
Source: [12]

The most important section in the structure of import is the section of Vegetables and fruit with 55 million dollars, which accounts for one-fourth (25.8%) of the total import from the above-mentioned economic group of countries. It is followed by Beverages with 33 million dollars (15.5%) and Tobacco and tobacco manufactures with 18 million dollars (8.7%). Cereals and cereal preparations with 15.5 million dollars and the share of 7.3% are also important commodity section. The above-mentioned commodity sections dominate with the share that is higher than a half of the total import (57.3%).

The average import of agro-industrial products from the Russian Federation amounted to 23 million dollars on the average, i.e. only 2.1% of the total import. Import from Russia has recorded the most dynamic increase compared to other regions at the rate of 18.9%.During the first year it amounted to 11 million, only to achieve 47 million dollars in the last analysed year. The most important section in the structure of import is the section of Tobacco and tobacco manufactures with 8.6 million dollars, which accounts for more than a third (36.7%) of the total import from the above-mentioned country. It is followed by Cereals and cereal preparations with 6.1 million dollars (26.3%) and Miscellaneous edible products with 2.7 million dollars (11.6%). Feeding stuff for animals is also an important section with 2.3 million dollars and the share of 9.8%. The above-mentioned sections dominate in import with the share of 84.4%. The highest import comes from the FYR Macedonia and it amounts to 82 million dollars, or 7.4% of the total import of agro-industrial products in Serbia (*Histogram 2*). It is followed by Germany with 76 million (6.9%), Brazil with 74 million (6.7%), Croatia with 65 million (5.9%), and Italy with 56 million dollars and the share of 5.1%. The share of the above-mentioned countries in the structure of the total import of agro-industrial products of Serbia account for almost one-third (31.9%).

2.3. Foreign Trade Exchange Balance of Agro-Industrial Products

During the analysed period, the Republic of Serbia has had a positive foreign trade exchange balance of agro-industrial products that amounted to 581 million dollars on the average. It has recorded a constant increase of trade surplus during the analysed period under the average annual rate of 37.6%. Negative foreign trade balance was registered only in the initial year and it amounted to 56 million dollars. However, it recorded surplus of 1,292 million dollars in the last analysed year (Fig. 9).

The analysis of foreign trade exchange per sectors reveals that all the sectors have recorded surplus, except for Crude materials, except fuels. The highest surplus has been recorded by the sector of Food and live animals with 513 million dollars on the average, followed by the sector of Animal oils and fats with 67 million dollars and sector of Beverages and tobacco with 16 million dollars. Foreign trade deficit amounting to 14 million dollars has been recorded by the sector of Crude materials, except fuels.

The analysis of foreign trade exchange per commodity sectors reveals that the highest surplus in foreign trade exchange has been recorded by Cereals and cereal preparations with 316 million, Vegetables and fruit with 187, and Sugar, sugar preparations and honey with 138 million dollars. The highest deficit in foreign trade exchange was recorded in the commodity section of Coffee, tea, cocoa, spices, and manufactures thereof with 98 million, Fish and preparations thereof with 73, and Tobacco and tobacco manufactures with 63 million dollars. In addition to the above-mentioned sections, a negative balance is also recorded by Feeding stuff for animals (not including unmilled cereals), Miscellaneous edible products and preparations, Oil-seeds and oleaginous fruits, and Crude animal and vegetable materials.

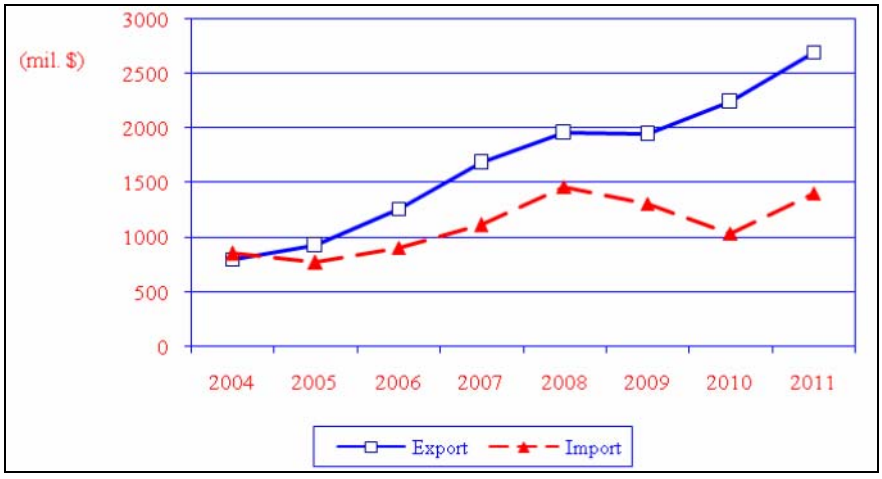

Figure 9: Trends in foreign trade balance of agro-industrial products of Serbia (million US dollars)
Source: [12]

The analysis per regional economic groups shows that the Republic of Serbia has accomplished a positive balance in foreign trade exchange with the European Union Member States – 335 million dollars on the

average. During the initial year of the analysed period, the balance amounted to 45 million dollars only to achieve 709 million dollars in the last analysed year. This means that the balance was growing under the rate of 41.34% per annum.

Republic of Serbia has also recorded a positive balance in foreign trade exchange with the signatory countries of the CEFTA Agreement – 548 million dollars on the average. During the initial year of the analysed period, the surplus amounted to 219 million dollars only to achieve 785 million dollars in the last analysed year. This means that surplus was growing under the rate of 20.44% per annum.

Constant increase of productivity, in particular of competitiveness, represents the necessity of every economy during the 21st century. This should be the imperative of Serbian economy, in particular of agro-economy [11]. For example, productivity of work and land in Serbian agriculture is far lower compared to the EU Member States and it is higher than the one in the CEFTA group.

CONCLUSIONS

The average export of agro-industrial products from the Republic of Serbia during the analysed period (2004-2011) made 1.7 billion US dollars and it recorded a significant growth under the average rate of 18.66% per annum. The most important export sections include Vegetables and fruit with 25.3%, followed by Cereals and cereal preparations with 22.7%, Sugars, sugar preparations, and honey with 10.5%. The highest value of export is directed towards the European Union Member States and it amounts to 799 million dollars on the average, which accounts for almost a half of the total export (47.3%). Somewhat smaller export is directed towards the countries of the CEFTA group, i.e. 761 million dollars on the average, or 45% of the share in the total export. Analysed per countries the highest export is directed to Bosnia and Herzegovina, Montenegro, FYR Macedonia, Germany, and Italy. The above-mentioned countries have absorbed 60.7% of the total export.

The average import of agro-industrial products of the Republic of Serbia made 1,108 million US dollars. Import has recorded growth under the average rate of 7.80%. It is evident that the import rate is far lower than the one of export, which is encouraging. The most important import sections include Vegetables and fruit with 21.6%, followed by Coffee,

tea, cocoa, spices, and manufactures thereof with 15.1%, and commodity section of Miscellaneous edible products and preparations with 9.4%.

The highest value of import has been recorded from the European Union Member States amounting to 464 million dollars, which accounts for almost a half of the total import (41.9%). Import has been growing under the rate of 6.12%. Import from the countries of the CEFTA group made 213 million dollars on the average, namely it made 19.2% of the total import. Import from the above-mentioned economic group has grown more intensively compared to import from the European Union (18.7%). The highest import has been coming from the FYR Macedonia, Germany, Brazil, Croatia, and Italy. The above-mentioned countries participate with almost a third (31.9%) in the structure of total import of agro-industrial products of the Republic of Serbia.

Republic of Serbia has had a positive foreign trade exchange balance of agro-industrial products that amounted to 581 million dollars on the average. It has recorded a constant increase of positive balance under the average annual rate of 37.6%. Negative foreign trade balance was registered only in the initial year and it amounted to 56 million dollars. However, it recorded surplus of 1,292 million dollars in the last analysed year. Favourable results of agro-industry of Serbia in foreign trade exchange have been accomplished thanks to the advantages in its preferential status on the markets of the European Union Member State, achieved liberalisation in exchange with the western Balkan countries (CEFTA) and within the circumstances that are still present at the world market, etc. It is necessary to upgrade agriculture and food industry in order to increase export. Adapting to the norms and standards of the importing countries and implementation of the marketing concept of doing business make the imperatives. A special attention should be paid to increasing productivity, competitiveness, and education of agricultural producers.

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SUSTAINABLE MANAGEMENT OF LAND, WATER AND BIODIVERSITY IN AGRICULTURE UNDER CLIMATE CHANGE

INTRODUCTION

Agriculture has a potential to play the lead role in the sustainable development due to its multifunctional character and impacts: economic (as a provider of foodstuffs, fibres, bio-fuels, and timber, and a source of income for farmers), social (as a source of employment, quality of life and health) and environmental (as a protector of soil, water, biodiversity, landscape and climate). There is increasing evidence that society is demanding for farmers to become stewards of natural resources and rural landscapes, often without corresponding economic gains. Nevertheless, sustainable management of land, water, biodiversity and climate is a concern of society as a whole and the government is required to strengthen legislation in these fields, complemented through the promotion and subsidization of voluntary measures.[66]

According to the UN Earth Summit of 1992, sustainable land management (SLM) is the *use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions*. SLM comprises four main categories of land management technologies: improved cropland management, improved pasture and grazing management, restoration of degraded land, and management of organic soils [2].

Sustainable land management combines technologies, policies and activities that are aimed at integrating socio-economic principles with environmental concerns so as to simultaneously maintain or enhance production, reduce the level of production risk, protect the potential of natural resources and prevent (buffer against) soil and water degradation, be economically viable, and be socially acceptable [47].

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[66] Trading environmental liabilities, such as carbon and biodiversity credits also may help to achieve sustainable use of resources and inputs in agriculture, as well as the use of certification schemes for sustainable production practices [7].

Soil quality is defined as the capacity of a specific soil to function within natural or managed ecosystem boundaries to sustain plant and animal production, maintain or enhance water and air quality, and support human health and habitation [48]. Land quality refers to the condition or "health" of land and specifically to its capacity for sustainable land use and environmental management [34]. Soil quality is a condition of a site and it is studied using soil data. Land quality is a condition of the landscape and requires the integration of soil data with climate, geology and land use. Sustainable land management requires the integration of these biophysical conditions of land with economic and social demands. It is an assessment of human habitation impacts, and a condition of sustainable development [9].

The production of food and other agricultural products takes 70% of the freshwater withdrawals from rivers and groundwater. Water-use efficiency is fundamental for increasing agricultural production and addressing climate change impacts. Upgrading rain-fed agriculture by soil moisture conservation practices as well as irrigation systems by technological and managerial improvements will enable more productive and sustainable water use in agriculture. Before implementing change, there must be an understanding of basin hydrology and an overall perspective on water allocation at the basin level. Hence, it is important to develop integrated water resources management (IWRM) at the basin level that encompass multiple water uses, water quality protection and flood effects mitigation, with adequate emphasis on developing, managing, and maintaining collaborative relationships for basin governance [30].

The EU Water Framework Directive - WFD (2000/60/EC) establishes a legal framework to protect and enhance the status of waters and water depending protected areas within a river basin, and ensure sustainable, balanced and equitable use of water resources. It establishes several common principles for water management, including public participation in planning and the integration of water management into other policy areas such as energy, transport, agriculture, regional policy and tourism. In accordance with WFD, the Danube countries, including Serbia, have developed the Danube River Basin Management Plan entailing measures of basin-wide importance as well as setting the framework for more detailed plans at the sub-basin and/or national level [22].

Land use change and intensive agriculture have caused land degradation, including soil biodiversity loss, nutrients release into rivers and excessive water withdrawals for irrigation and landscape fragmentation. The Millennium Ecosystem Assessment pointed out that intensive agriculture have been responsible for the loss of biodiversity and habitats as well as the trade-offs with other ecosystem services, particularly regulating ones, essential for agriculture (pollination, biological pest and disease control, flood retention capacity, climate regulation) [25]. The loss of genetic variability in domesticated livestock breeds and crop sorts and varieties is very serious as genetic diversity is a key factor of sustainable intensification of agriculture in the future [54]. On the other hand, preservation of a large number of protected and rare plant and animal species depends of low-intensity agriculture, inherent to high nature value (HNV) farmland.

The outcome document from the Rio+20 UN Conference on Sustainable Development recognized that adaptation to climate change, conservation and sustainable use of biodiversity, desertification, land degradation and drought mitigation, and development of integrated water resources management represent an immediate and urgent global priority [56].

FAO strongly argues for priority actions in sustainable and adaptive natural resources management, such as land-use planning and soil, water, ecosystems and genetic resources management in order to improve resilience to climate change [13]. The agricultural sector can contribute to the climate change solution by capturing synergies that exist among activities to develop more productive and resilient food production systems and improve natural resource management. To be synergistic, these activities must be based on *ecosystem approach*[67], landscape scale and inter-sector coordination.

FAO uses term climate-smart agriculture (CSA) to determine agriculture that *sustainable increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation) while enhancing the achievement of national food security and development goals* [15].

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[67] According to UNCBD, ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way, http://www.cbd.int/ecosystem/default.shtml.

Climate - smart agriculture encompasses sustainable agriculture, expanding it to include the need for adaptation and the potential for mitigation with associated technical, policy and financing implications. The CSA approach involves site-specific assessments of the adaptation, mitigation and food security benefits of a range of agricultural production technologies and practices, and identifies those which are most suitable for a given agro-ecological and socio-economic situation. The development of a national CSA strategy is an opportunity for coordination of key agricultural development and climate change stakeholders in a unified vision of agriculture development under climate change, including instruments of support to agricultural producers in making the desired changes [14].

Serbia as a candidate country for EU membership, in the pre-accession period seeks to harmonize environmental and sector legislation and practice with the relevant in the EU, along with fulfilling the obligations in these areas it has assumed by signing international conventions (UNFCCC, UNCCD, UNCBD, etc.), but delays in by-laws adoption, lack of national strategic documents in agricultural and climate policy, underdeveloped local institutional infrastructure and financial bottlenecks significantly slow down the implementation processes.

In this chapter, authors' attention will be devoted to assessment of land, water and biodiversity resources availability and capability for sustainable agricultural production as well as to the policies of their sustainable use in agriculture under climate change.

1. SUSTAINABLE LAND MANAGEMENT

1.1. Soil and Land Quality

The soils of the Republic of Serbia are characterized by great diversity and mosaic-like structure of the present soil types (Figure 1).

According to the data from the Institute of Soil Science, Belgrade (2011), the following types and associations of soils are the most common: distric cambisols on eruptive and metamorphic rocks – 1,890,600 ha (21.4%); chernozem – 1,212,700 ha (13.7%); fluvisols and humogleys – 928,820 ha (10.6%); soils on limestone (calcomelanosols and calcocambisols) – 907,630 ha (10.3%); brown soils on sandstones, flysch and other

sediments – 816,100 ha (9.2%); smonitzas (*Vertisol*), including eroded and degraded smonitzas – 762,250 ha (8.6%); eutric cambisols, including luvic and eroded eutric cambisols – 729,350 ha (8.3%); pseudogleys and ilimerised pseudogley soils – 490,375 ha (5.6%); serpentine soils – 267,700 ha (3%); halomorphic soils – 242,200 ha (2.7%); and rankers – 123,875 ha (1.4%) [19].

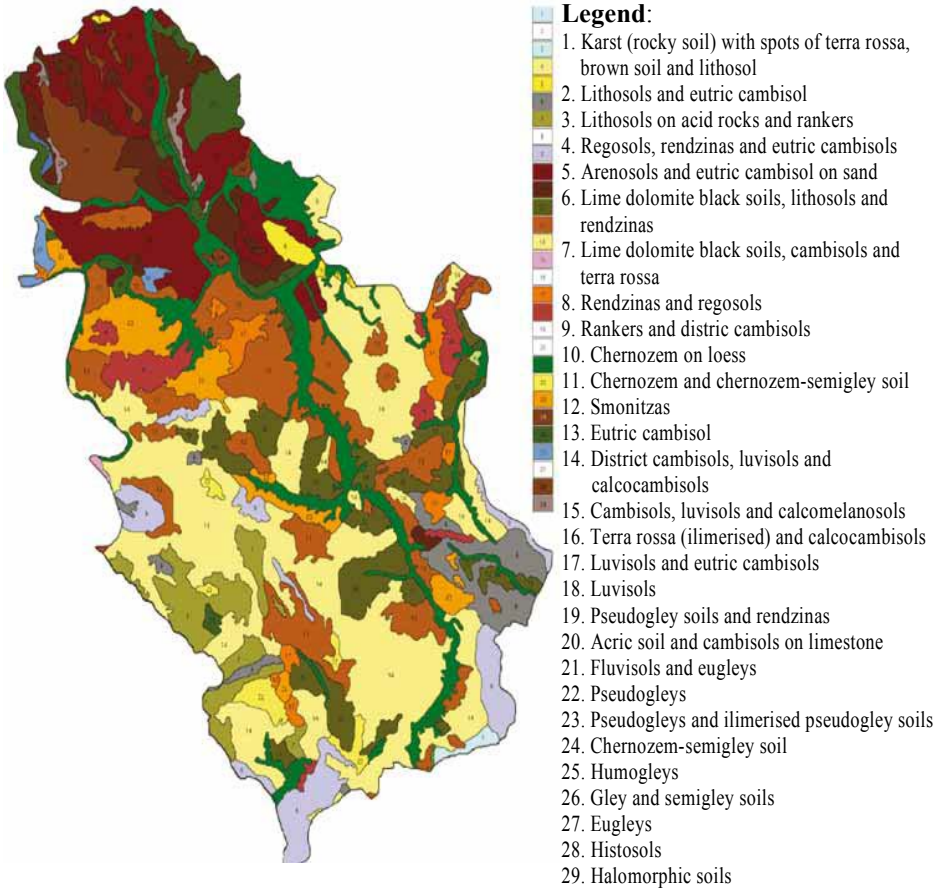

Figure 1: Soil map of Serbia
Source: [53].

Based on the natural characteristics of land (soil type with certain characteristics in terms of natural fertility, and landscape features related to altitude, rainfall, slope and exposure) and the degree of contamination with dangerous and harmful substances, and regardless of the current mode of use, land parcels are classified in eight capability classes, designated by the numbers 1 through 8.

Land capability classification shows, in a general way, the suitability of soils for agricultural production and forestry. The numbers indicate progressively greater limitations and narrower choices for cultivation, i.e. productive uses of land in agriculture and forestry (Tab.1).

Capability classes	*Area – km²*				*%*			
	Republic of Serbia	*AP Vojvodina*	*Central Serbia*	*UNMIK Kosovo*	*Republic of Serbia*	*AP Vojvodina*	*Central Serbia*	*UNMIK Kosovo*
I	11,650	9,688	1,675	287	14.4	51.4	3.2	2.8
II	9,357	3,284	5,481	592	11.6	17.4	10.6	5.8
III	10,522	3,823	5,383	1,316	13.0	20.3	10.5	13.0
IV	8,682	355	7,133	1,194	10.8	1.9	13.8	11.8
Suitable for cultivation	40,211	17,150	19,672	3,389	49.8	91.0	38.1	33.4
V	11,073	531	9,002	1,540	13.7	2.8	17.4	15.2
VI	20,144	889	17,185	2,070	25.0	4.7	33.2	20.4
VII	8,069	193	5,232	2,644	10.0	1.0	10.1	26.1
VIII	1,178	72	604	502	1.5	0.5	1.2	4.9
Unsuitable for cultivation	40,464	1,685	32,023	6,756	50.2	9.0	61.9	66.6
Total fertile land	80,675	18,835	51,695	10,145	100.0	100.0	100.0	100.0
Infertile land	7,686	2,671	4,273	742	-	-	-	-
Total	88,361	21,506	55,968	10,887	-	-	-	-

Table 1: Land capability structure
Source: [20].

1.2. Land Use and Land Use Change

According to data of the Statistical Office of the Republic of Serbia (without data for UNMIK Kosovo) in 2011 it was involved in agricultural production 5,056,051 ha, while additional 40,216 ha were occupied by swamps and marshes, so that the total agricultural area amounted to 5,096,267 ha (65.8% of the country territory). In the same year the arable land and gardens occupied 3,293,577 ha (65.1% of utilized agricultural land), orchards 239,948 ha (4.7%), vineyards 56,434 ha (1.1%), meadows 621,418 ha (12.3%) and pastures 844.674 ha (16.7%). The most of sown arable land is under cereals (62.3%), while it is 14.8% under fodder crops, 14.0% is under industrial plants and 8.9% under vegetable crops. The rest of 176,988 ha is uncultivated one [44, 51].

The family farms make up 99.6% of the total number of farms in the Republic of Serbia. The average family farm in the Republic of Serbia uses 4.5 ha of agricultural land and has one head of cattle, four pigs, three sheep, 26 heads of poultry and one bee-colony. There are significant regional differences. The largest area of agricultural land are used by the farms in the region of Vojvodina, while the largest number of livestock has been raised on farms south of the Sava and Danube rivers [49].

Agricultural production is carried out under the four **climatic-production zones** (according to the Rulebook for cadastral classification and land evaluation, Official Gazette of RS, No 61/12) - in the plain, hilly, hilly-mountainous and mountainous zones.

The plain zone extends to an altitude of 250 metres. The average annual temperature is higher than 10.5 °C; the average annual precipitation is not higher than 700 mm (in AP Vojvodina at Zemunska, Titelska and Telečka loess plateaus, and in the Central Serbia, in the South Morava River valley, up to 600 mm). The rainfall in the vegetation period amounts to an average of 350 mm and in this region there is no limit for cultivation of all crops. There are more or less represented the soils of the first, second, third and fourth capability classes. This is a zone of intensive crop production, first of all the grains and industrial crops (Vojvodina, Mačva, Stig, Pomoravlje), on family farms and estates of entrepreneurs as well as the legal entities.

The hilly zone extends to an altitude between 250 m and 650 m, south of the Sava and Danube (Šumadija, Pomoravlje, Kolubara, Metohija). The average annual temperature is higher than 9.5 °C, the average annual precipitation ranges up to 750 mm (at the Kosovska plateau on 700 mm, while at Metohija, influenced by the Mediterranean climate even to 1000 mm, but the most important summer months, July and August are extremely drought). The precipitation in the vegetation period is up to 400 mm. With very few restrictions, in this region there can be grown all crops, while there are mainly represented the soils of the second, third, fourth and fifth capability classes. An intensive production of grains and forage crops is mixed with intense, indoor cattle breeding, as well as the pig and poultry ones, mainly on the family farms (Fig. 2).

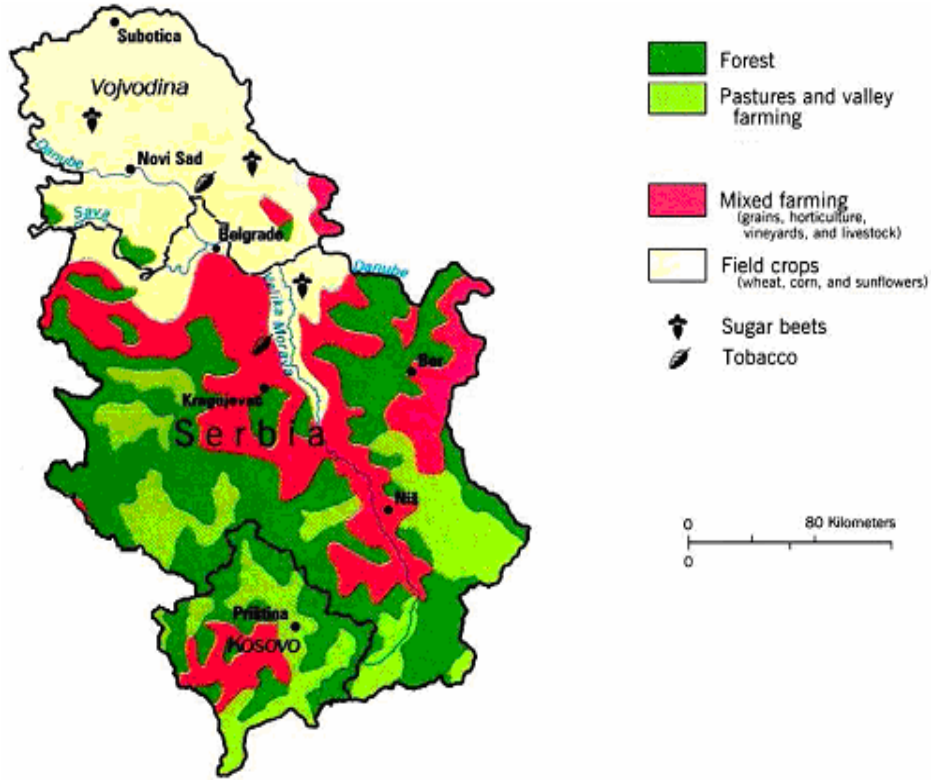

Figure 2: Land use and agriculture in the Republic of Serbia
Source: [32].

The hilly-mountainous zone extends to an altitude between 650 m and 1000 metres. The average annual temperature is up to 8 °C. The average annual precipitation is up to 800 mm, while in vegetation period it exceeds 400 mm. The number of crops is limited, there cannot be grown the maize or vineyards. Here are represented mainly the soils of the fourth, fifth and sixth capability classes, while this region, specifically its western part, is known by production of raspberries and potatoes.

The mountainous zone cover an area at an altitude above 1,000 metres, with average annual temperature below 6 °C and an average annual precipitation of 900 mm or more, while in the vegetation period it exceeds 450 mm. The number of crops is limited onto the spring small types of grain, while there cannot be grown vineyards or orchards. Here are represented mainly the soils of the V-VIII capability classes. This is the zone of the livestock grazing, as well as the low-intensive agriculture and high nature value farmland.

1.3. Land Degradation

The production practices of intensive agriculture, especially those whose use is not harmonized with the natural conditions of the area (relief, soil, and climate) influence the occurrence / intensification of the land degradation process: erosion and landslides; compaction; organic matter decline; acidification; and salinization and alkalization. Agricultural land is exposed to contamination by pesticides and heavy metals from fertilizers and non- agricultural sources – of the geochemical and anthropogenic origin, as well as to the sealing caused by occupation for construction and infrastructure.

Geological and pedological base, relief, climate, and land use are the main factors that determine the occurrence and intensity of *erosion*. According to Lazarević (2009), 76,354.4 km^2 or 86.4% of the country territory has been affected by erosion, of which: 513.5 km^2 (0.7%) by *extensive erosion* (the first of the five categories of erosion), 2,919 km^2 (3.8%) by *strong erosion* (the second category) and 14,750.2 km^2 (19.3%) by *erosion of medium strength* (the third category) [24].

Fluvial erosion, with collapse of the riverbeds and flooding the surrounding terrain, is present along the river flows and it is caused by heavy rain and rapidly melting snow, as well as the torrential activity and slope erosion in the upper, hilly-mountainous parts of the river flows.

Erosive action of slopes, developed on terrains built of unbound, weakly bound and bound degraded rock masses and associated with torrential activity, is the mostly intensive on the edge of Vranjska valley, in Grdelica gorge, in the basin of the rivers Vlasina and Pčinja in South-East Serbia; then in the Binačka Morava river basin at area of Kosovo; in the valley of the river Lim as well as in the upper course of the river Ibar in South-West Serbia as well as in hilly areas of Šumadija. The wind erosion is characteristic for the most part of the Vojvodina plain. Between 20% and 25% of Serbia's territory has been affected by *landslides,* while the deepest landslides have been formed in the coastal area of the Danube and Sava rivers (northern slopes of Fruška gora mountain, the area of Belgrade and Smederevo cities) [43].

Intensive land cultivation by heavy machinery leads to the process of *soil compaction*, thereby deteriorating its water-air regime, as well as a *reduction of soil organic matter*. Maintaining of the organic carbon level

in the soil is extremely important, both from the standpoint of soil fertility, and to mitigate climate change. According to the systematic control results of the agricultural land fertility on the territory of the Republic of Serbia, carried out in 2011, 58.2% of the samples had a content of organic carbon in the range of 1-2%, 30% of the samples had 2-5%, and 11.4% of the samples had only 0-1% [43]. The land in Vojvodina is best provided by the humus. The natural content of humus in Vojvodina chernozem is higher than 3%, which is the limit between the land well and poorly provided with humus, but in the last decades it has been significantly reduced - by an average of 0.38% [1], mostly because of inadequate agricultural practices (insufficient application of manure, as well as crop residue removal/burning and intensive cultivation of land in the crop, fruit and grape production).

The mentioned systematic control of the agricultural land fertility made in 2011 showed that in AP Vojvodina there are dominant the soils of weakly alkaline reaction, calcareous ones, with optimal content of easily accessible phosphorus and high content of easily accessible potassium. In Central Serbia, situation is slightly different. There are dominant the soils of acid reaction, the slightly calcareous ones, with a very low content of easily available phosphorus and high content of easily available potassium. By *acidification* there are particularly endangered the areas of the South-East Serbia, Šumadija, Kolubara basin, Jadar, Pocerina and surroundings of Leskovac city. Application of the inappropriate composition fertilizer without previously done analysis of the soil nutrients contributes to further soil acidification/alkalization and endangers the quality of waters.

Over 240,000 ha of land are *salinized and alkalized*. Salinized and alkalized soils are localized in Vojvodina. A high level of ground water, as well as the use of inadequate quality of water for irrigation, increases the concentration of salt in the soil. Analysis of the quality of irrigation water in Vojvodina, conducted in 2004, showed that the surface water were moderately saline and mostly belonged to the class of middle salt water, with low content of sodium (C2S1),[68] and a much smaller number of cases belonging to the class of salt water, but also with low sodium content (C3S1). In a class of salted water with middle content of sodium (C3S2), which can lead to alkalization of the low permeability soil, it was found only one sample of well water [6].

[68] US Salinity Laboratory Classification.

On the issue of *contamination* of agricultural soil with heavy metals and pesticide residues, land in rural areas is almost clear, if it is excluded the excessive content of potentially available nickel (Ni), cadmium (Cd) and chromium (Cr) in Vojvodina and nickel (Ni), cadmium (Cd), chromium (Cr), arsenic (as),and lead (Pb) in Central Serbia, that is of geochemical origin, as well as an increased content of copper (Cu) in a small number of fruit and wine-growing districts (Petrovaradin, areas around Vršac, Negotin, Aleksandrovac, Kruševac and Niš, Kosmaj, Jošanička spa, Krupanj). An increased content of copper is present in the vicinity of Bor copper mine and Majdanpek. In the vicinity of the Bor copper mine and near Resava and Zvornik coal mines it was registered a high content of arsenic (As), while in the agricultural land in the vicinity of the Kostolac and Kolubara coal basins and TENT Obrenovac there have been registered increased concentrations of cadmium (Cd), cobalt (Co), copper (Cu) and nickel (Ni). Testing of soil quality in urban areas indicate exceedance of limit values for the presence of certain heavy metals, polycyclic aromatic hydrocarbons and pesticide residues, which should be closely monitored, having in mind the developed peri-urban agriculture. In a small number of soil samples in the vicinity of busy roads it was found an increased content of lead (Pb) [6; 43; 46].

Preliminary researches carried out on the part of agricultural land of UNMIK Kosovo territory (EULUP Project), primarily in the areas of (previously) developed industrial and mining activities, confirm the presence of excess contents of heavy metals, especially chromium (Cr), nickel (Ni), lead (Pb), arsenic (As) and cadmium (Cd) [12].

According to the SEPA data, there were identified 332 potentially contaminated sites on the territory of the Republic of Serbia in 2011[69] (public municipal landfills 38.9%, sites related to the exploitation and oil refining 28%, industrial and commercial sites 10.8%). Remediation was performed on 2.4% of identified sites [43].

Soil sealing is related to the occupation of land in the construction and infrastructure purposes, causing the land forever denied the ability to

[69] Determination of contaminated sites was carried out on the basis of the Regulation on the program of systematic monitoring of soil quality, indicators for assessment of the soil degradation risk and methodology for developing the remediation programs (Official Gazette of RS, 88/10).

perform its ecological functions, increasing the risk of flooding, causing in the cities the heat island effect, while agriculture loses valuable basic resource for production. According to the Corine Land Cover data, in the 1990-2006 period it was occupied in Serbia 5,623 hectares for the purposes aiming at the expansion of urban areas and the construction of sports and recreational facilities, 2,026 hectares for the industrial and commercial sites, 28 ha for the road network and supporting infrastructure, while 3,825 hectares for the needs of mines, waste disposal and construction sites. There have been mostly occupied the land under pastures and the mixed agricultural areas (5,098 ha), as well as the arable land and permanent crops (3,407 ha) [45; 46].

The surface coal mines occupy about 12,000 ha, with a tendency of taking over a new 200 ha per year. The thermal power plant ash landfills occupy around 1,200 ha, dispose of the metal ores waste products 3,000 ha, while 1,000 ha is under land borrow sites. Revitalization of degraded agricultural areas represents a legal obligation of users of these lands, but due to the lack of financial resources it does not goes by anticipated pace [31].

In the 2002-2011 period the total agricultural area has been decreased by 11 thousand hectares (from 5,107 thousand hectares to 5,096 thousand hectares). It is observed trend of reduction in arable land and vineyards, the areas under orchards and meadows are stagnating, while areas under pastures and ponds, swamps and marshes are increasing [51; 52]. Since Serbia has 4 million hectares of the I-IV capability class land, suitable for cultivation, the grassing and reforestation of marginal arable land and increasing areas under reeds and marshes can be estimated as positive, particularly in terms of carbon sequestration, without fear of the availability for agricultural purposes.

2. INTEGRATED WATER RESOURCES MANAGEMENT

2.1. Water Resource Availability

The elements of the hydrological balance of Serbia have the following values: average rainfall 734 mm/year, the domestic water runoff of 509 mm^3/s (181 mm/year), the average evapotranspiration 552 mm/year and the average runoff coefficient of 0.25 [33].

With the specific annual availability of *domicile surface water* of about 1,500 m^3 per capita (of about 2,500 m^3 which is the lower conditional limit of the long-term self-sufficiency for the sustainable development of a country), Serbia is one of the poorer regions in Europe in terms of water [10]. Poorest in terms of water are densely populated low-lying areas, with the highest quality of land resources (Pomoravlje, Kolubara, Šumadija, Vojvodina, Kosovo, South Serbia), while the high qualitative water resources are positioned along the edge of the country (Podrinje, Starovlaške mountains, Šara, Prokletije, Vlasina). Most of the annual flow is realized in the short torrential high water, after which occur the long-term periods of low flows.

The average flow of *the transit waters* is significant and amounts to about 5,163 m^3/s, but it should be kept in mind its time unevenness (in the low-water period the flow amounts to 1,500 m^3/s)[70] as well as the fact that availability and quality of transit water depend on interventions in upstream countries [10]. Utilization of transit waters requires rehabilitation and upgrading of regional hydro-systems as well as an active international cooperation. Total gross potential of *groundwater* is estimated to about 67m^3/s [33], but from the ecological and hydraulic reason it cannot be used more than half of these potential [10]. Excessive exploitation (Bačka, Banat) and inadequate protection of water sources limit their sustainable use.

2.2. Water Quality

According to the SWQI (Serbian Water Quality Index) composite index of the surface water quality[71], in 1998-2011, the lowest quality had the waters of rivers and canals in Vojvodina Province. In relation to the total number of samples from all river basins, in the category of "very bad" almost 83% of the samples were from the territory of Vojvodina, while 46% of the total number of samples from this river basin area were in categories marked as "very bad" and "bad" (Fig. 3).

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[70] Danube flows when entering Serbia are oscillating from the average 2,268 m^3/s to a maximum 4,738 m^3/s in the period of high water, i.e. to a minimum 839 m^3/s in the period of low water [26].

[71] SWQI covers the ten parameters of physical-chemical and microbiological quality (oxygen saturation, BPK, ammonium ion, *pH* value, total nitrogen oxides, orthophosphates, suspended solids, temperature, conductivity and coliform bacteria).

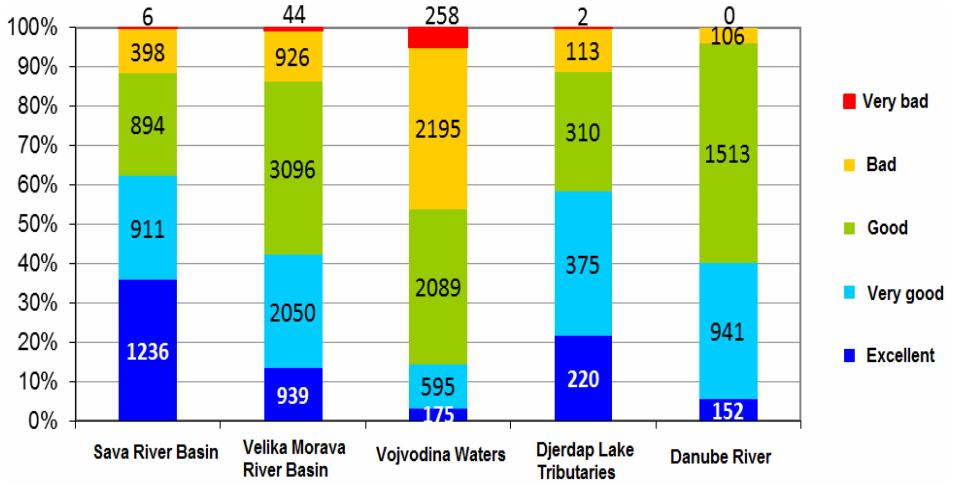

Figure 3: Ranking of the quality of water samples using SWQI index
Source: [43].

They are especially disturbing the monitoring results of the priority and priority hazardous substances[72], which enter the river flows due to discharge of untreated municipal, industrial and agricultural wastewater. In 2011 there was registered exceeding of the maximum allowable concentration (MAC) of cadmium (Cd) and mercury (Hg) on total number of 39 measuring profiles, and on most of them even several times during the year [43].

Regarding the quality of surface and ground water, agriculture is monitored in terms of diffuse water pollution by mineral and organic fertilizers and pesticide residues. Analysis of the frequency distribution of the nutrients' concentration classifies the surface waters into two ranks - satisfactory with the corresponding concentrations of the parameters in I and II classes of ecological status, as well as *unsatisfactory* with concentrations of parameters in III, IV and V ecological status class.[73] Concentration of nutrients (ammonium ion NH4-N; nitrates NO3-N; and orthophosphates PO4-P) range within the limits prescribed for the class

[72] The Regulation on limit values for priority and priority hazardous substances that pollute surface water and deadlines for their achieving (Official Gazette of RS, 35/11).
[73] According to the Regulation on limit values for pollutants in surface and ground waters and sediments, and the deadlines for their achievement (Official Gazette of RS, 50/12), the limit values for the class III amount to: BPK = 7 mgO/l, nitrates = 6 mgN/l, ammonium ion = 0,6 mgN/l, orthophosphates = 0,2 mgP/l).

I and II, which corresponds to the waters of excellent and good ecological status[74] (Fig. 4).

The results of the analysis of long-term trends in nutrient concentrations in surface waters showed that orthophosphates were the most common nutrient pollutants of water, so it is necessary to pay special attention to the application of phosphorus fertilizers in agriculture as one of the major source of diffuse water pollution.

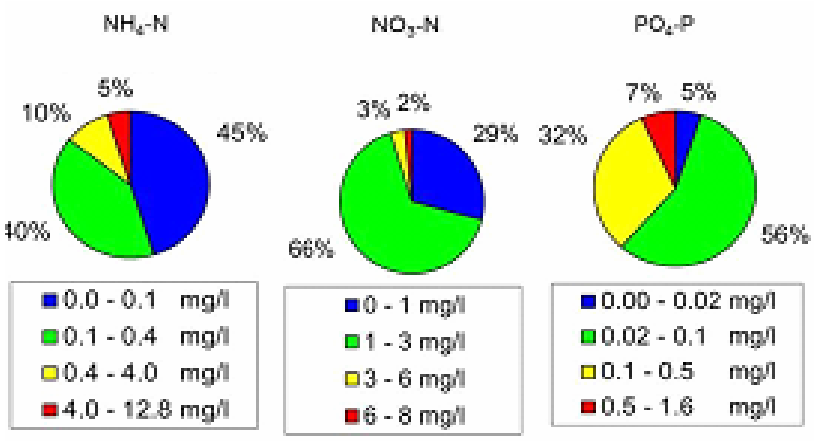

Figure 4: Distribution of nutrient concentration frequency in Serbianwatercourses, 2001-2010.
Source: [43].

Analysis of the groundwater quality in the coastal areas of major rivers done in 2005-2011, concerning the presence of nitrate, chloride and ammonium ions, showed that the share of the nitrate concentrations (NO_3) above maximum allowed (MAC) of 50 mg/l amounts less than 5%; that chloride concentrations do not exceed the limit value of permitted presence in drinking water of 200 mg/l; that in about 15% of the samples the content of ammonium (NH4) is above the EU MAC of 0.5 mg/l (Directive 98/83/EC), and in less than 5% of the samples exceeded the MAC of the World Health Organization of 1.5 mg/l, which leads to the conclusion that the observed contaminants do not compromise the deeper aquifers [43].

[74] According to the Regulation on the parameters of the ecological and chemical status of surface waters and the parameters of the chemical and quantitative status of groundwater, (Official Gazette of RS, 74/2011).

2.3. Irrigation and Drainage

Around 3,641 million hectares of land in the Republic of Serbia are in the classes I-III as appropriate for irrigation, of which in the first two classes there are approximately 1.6 million of the most productive land in the plains and valleys of major rivers (Fig. 5).

According to the preliminary data of the Statistical Office of the Republic of Serbia (without data for UNMIK Kosovo), in 2012 it was irrigated 52,986 ha of 94,532 ha covered by irrigation systems, more than in 2011 (34,175 ha) and the greatest area since 2003.[75]

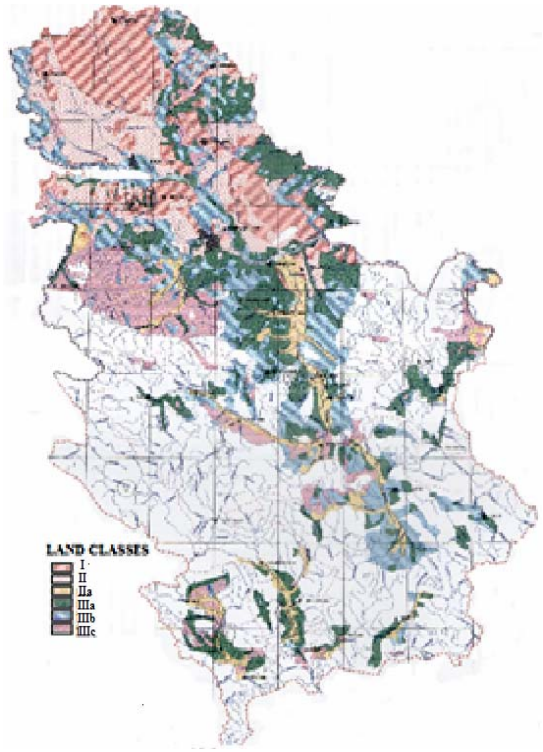

Figure 5: Land classes suitable for irrigation
Source: [11].

[75] According to data of The Institute for Water Management "Jaroslav Černi" for areas of the Central Serbia and AP Vojvodina – in addition to 106 built hydro-systems, with capacity of 105,522 hectares, of which there are operating 40,914 ha, there are irrigated additional 57,000 ha: 30,000 ha within technically completed, individual systems in private property, 15,000 ha within technically non-completed systems in private property, 2,000 ha on the experimental fields of agricultural schools (technically completed systems) and 10,000 ha locally, on the garden plots (technically non-completed systems) [26].

The irrigation is carrying out by sprinkling (47,744 ha), drip system (2,566 ha) and surface method (2,676 ha). The share of irrigated area related to the total used agricultural area is amounted to 1.26%. In 2012 it was drawn 110,445 thous.m^3 of water for irrigation, the most from rivers (91%), and the remaining from groundwater, lakes and reservoirs, and public water supply network [43, 50].

Most of the irrigated areas are located in Vojvodina - about 30,000 ha, and there is the responsibility of the country's largest hydro-system Danube-Tisa-DanubeCanal (HS DTD). The irrigation capacity of HS DTD is 510,000 ha, the systems currently cover the area of 84,644 ha, but in operation conditions, fully or partially, the system is on area of 46,192 ha, while it is functioning only on the area of 29,948 ha [41] (Figure 6).

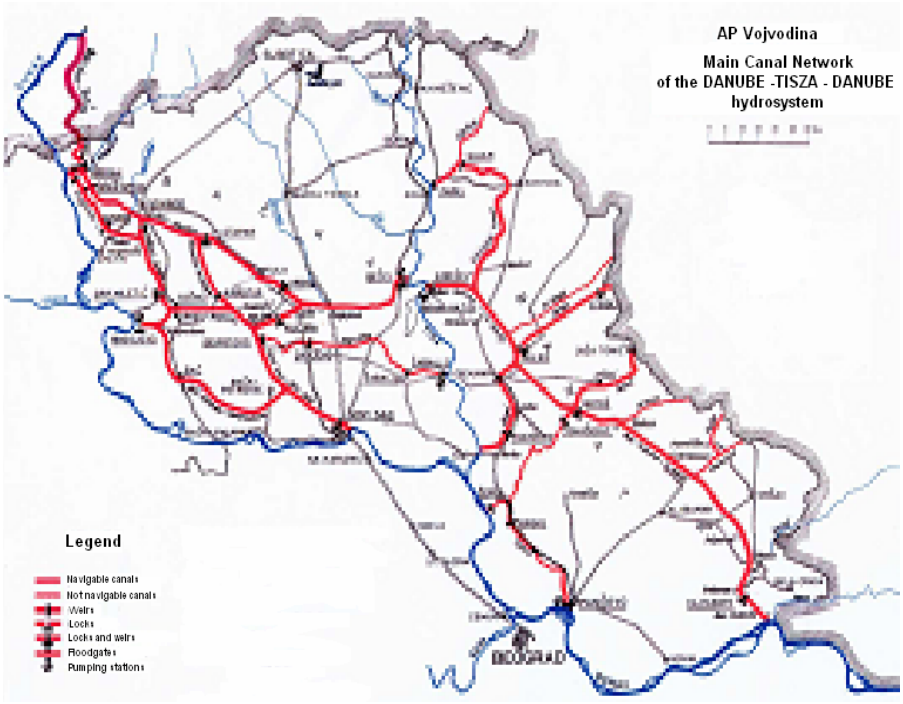

Figure 6: DTDCanal - Main canal network
Source: [41].

About 2.5 million ha of net used agricultural land and other facilities in Vojvodina and valley regions of Central Serbia as well as in Kosovo is necessary to be protected from the groundwater and waterlogging.

The drainage systems (400 systems) are covering approximately 2.08 million ha, of which 1.63 million ha in Vojvodina [11]. Within HS DTD the drainage is carrying out on 1.06 mil. ha, in Bačka 0.55 mil. ha and in Banat 0.51 mil. ha.

Faced with forecasts of deteriorating climatic conditions in South-East Europe[21], Serbia has been committed to the improvement of irrigation as the basic measure to mitigate the effects of drought [8].

On the basis of that there have been made the credit arrangements with the World Bank (IBRD/IDA Development Credit Agreement, 2005 and Additional Financing Loan Agreement, 2007) for financing of the *Irrigation & Drainage Rehabilitation Project* (P087964) in the 2005-2013 period. In addition, MAFWM has been started in 2012 with implementation of wider project for rehabilitation, revitalization, reconstruction, modernization and construction of irrigation systems on the area of 1.1 million ha in the next four years' period (*Irrigation Development in the Republic of Serbia* Project) (Official Gazette of RS, No. 17/2012).

3. AGROBIODIVERSITY AND LANDSCAPE PROTECTION

3.1. Genetic Resources in Agriculture

Agrobiodiversity is a vital subset of biodiversity and encompasses the variety and variability of animals, plants and micro-organisms that are necessary for sustaining key functions of the agro-ecosystem, including its structure and processes for, and in support of, food production and food security [16].

Traditional production practices and local knowledge and culture are integral parts of agrobiodiversity, because farmers as the custodians of agro-environment assist in the evolution and adaptation of plant and animal species for centuries. Agrobiodiversity is threatened around the Planet by intensive agricultural production, based on a smaller number of improved, high yielding varieties and breeds. Consequently, there were rapidly disappearing from the fields and farms the traditional local varieties of plants and animals. Together with urbanization and abandonment of agriculture in marginal rural regions, there are also disappearing their wild relatives in the immediate environment of

agricultural holdings, and with disappearing of traditional agriculture there is lost as well the knowledge and experience that become valuable at this time facing with the climate changes and new challenges related to nutrition and health of the people, plants and animals. Serbia has been also affected by these processes.

On the territory of Serbia there have been grown over 150 plant species. According to the MAFWM Directorate of Plant Protection, in the last 50 years there have been developed in Serbia over 1,200 varieties of agricultural plants (more than 740 varieties of small and millet-like grains, 170 varieties of industrial crops, 70 varieties of forage plants, 120 varieties of vegetables, 40 varieties of fruits and 50 varieties of vines, as well as 6 varieties of horticultural and medicinal plants) [27].

It is important for food production and agriculture a large number of wild relatives of the cultivated fodder crops, as well as the medicinal and aromatic plants, fruits and forest fruits, which, in addition to ecological importance, have a significant economic potential at the market of organic food and products with the geographic origin protection.

On the list of indigenous breeds of domestic animals and endangered livestock breeds[76] there are the following:

- ***Endangered autochthonous breeds*** - horse (Domestic Mountain Pony and Nonius), donkey (Balkan Donkey), cattle (Busha and Podolian Cattle), buffalo (Domestic buffalo), pig (Resavka, Moravka and Mangalitza), sheep (Pirot Zackel, Karakachan Sheep, Krivovir Sheep, Bardoka Sheep, Lipska Sheep, Vlaška Vitoroga Sheep and Čokan Cigaja), goat (Balkan Goat) and poultry (Svrljig Black Hen, Sombor Kaporka and Banat Gološijan).

- Not endangered autochthonous breeds – sheep (Svrljig Sheep, Sar Mountain's Sheep and Cigaja), turkey (Domestic Turkey), duck (Domestic Duck), goose (Danube Goose), guineafowl (Domestic Helmeted Guineafowl), pigeon (Serbian High Flying Pigeon), bee (Apis mellifera carnica) and dog (Sarplaninac).

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[76] Regulation on the List of genetic reserves of domestic animals, methods of preserving genetic reserves of domestic animals, as well as the List of indigenous breeds of domestic animals and endangered livestock breeds, Official Gazette of RS, No. 38/10.

Genetic resources of relevance for food production and agriculture are held in *ex-situ* conditions or they are held in traditional farming systems.

In the national gene bank collection in Belgrade there are 4,238 samples of plant genetic resources (2,983 cereals, 367 industrial plants, 214 vegetables, 285 forage plants and 389 medicinal and aromatic plants), while the measures of the *in-situ* or *on-farm* protection are particularly important for preservation of indigenous and ancient varieties of crops and breeds of animals in their natural habitats, i.e. in extensive production systems.

3.2. High Nature Value Farmland

Maintenance of extensive production systems is particularly important for the protection, preserving and development of agricultural areas of high natural value (HNV farmland), which includes the protected areas as well (PA, IBAs, IPAs and PBAs).

The concept of the HNV farming is interesting for Serbia, given the vast mountain pasture areas rich by biodiversity, whereas it has been developed for centuries an extensive, so-called mountain agriculture (HNV farmland Type 1), as well as a large number of protected areas. Also, the distinctive mosaic agricultural landscapes of Central Serbia is due to the small holdings, where there has been traditionally represented a mixed plant-animal production, mainly of low intensity (HNV farmland Type 2).

By the mapping of HNV farmland (where precedence had HNV farmland Type 1 and, to a less extent, HNV farmland Type 2) it was determined their area of about 11,872 km^2 (19% of agricultural land or 13% of the country territory) [5].

Protected areas cover 527,152 ha (5.91% of territory of Serbia) [43]. By the Spatial Plan of the Republic of Serbia (Official Gazette of RS, 88/10), it is projected that until 2015 there would be protected by some form of protection around 10% of Serbian territory, and until 2021 around 12% of the territory of Serbia.

4. CLIMATE CHANGE AND AGRICULTURE

4.1. Basic Climate Characteristics

Most of the territory of Serbia has the temperate continental climate with distinct local variations, caused by relief, vegetation and degree of urbanization. It is characterized by cold winters and hot summers, while the autumn is warmer than spring. Maximum rainfall is in early summer, in June, and a minimum is in February and October. The South-western part of the territory is on the border of the Mediterranean and continental climate (cold winters and hot and dry summers, with maximum rainfall in November-January period and minimum in August). The mountain areas with an altitude of over 1,000 m have a continental climate.

According to the Republic Hydrometeorological Service of Serbia (RHMS) [58],an average annual air temperature in 1961-1990, for the areas with an altitude up to 300 m, amounts to 10.9 ^{o}C. The areas with an altitude of 300-500 m have an average annual temperature of about 10.0 ^{o}C, and over 1,000 m of altitude have around 6.0 ^{o}C. The absolute temperature maximums in 1961-1990, were measured in July (37.1 - 42.3 ^{o}C in lower areas, and 27.6 - 34.0 ^{o}C in the mountain areas). The absolute minimum temperatures were recorded in January (from -30.7 to -21.0 ^{o}C in the lower regions, and from -35.6 to -20.6 ^{o}C in the mountain areas).

Areas with annual rainfalls below 600 mm are in the northeast part of the country and in the valley of the South Morava as well as in the part of Kosovo. In the Danube Basin, Great Morava valley and further on to the south-east, the rainfalls are reaching 650 mm. In the mountainous areas of Southeast and Eastern Serbia the annual rainfalls amount to near 800 mm. The rainiest areas are the mountain ones to the west and southwest of the country where the annual values of this climate parameter reach and even exceed 1,000 mm. The snow cover appears in the November-March period, while the largest number of days with snow is in January.

The annual insolation amounts ranged from 1,500 to 2,200 hours. North-western and western winds are blowing in the warmer part of the year, and eastern and south-eastern winds during the colder part of the year (in the mountain areas of south-western Serbia the south-western winds).

4.2. Climate Change Trends

The average annual temperature in Serbia since 1980 has recorded a positive trend[77] that has been intensified in two recent decades. The growth of temperature has been the most intensive in Vojvodina, near Loznica city, in the wider area of Belgrade and in Negotinska krajina. Only the southeast part of the country is characterized by a negative trend.

For most of this period (1982-2000) the increased temperatures have been accompanied by a trend of prevailing negative values of annual rainfalls, which were most pronounced in the east of the country – in Negotinska krajina, in the valleys of the Great and South Morava Rivers and in the Vranjska valley. The positive trend of annual precipitation sum was recorded in the areas of Pešter and Zlatibor, in the southern part of Kosovo, as well as in the north part of the country [35; 42].

According to IPCC Fourth Assessment Report (2007), it has been anticipated deterioration of the climate in the region of Southern Europe, which includes Serbia. In the scenario of partial implementation of measures for reduction the emissions of greenhouse gases (GHGs) in the second half of the 21st century, by the end of this century the average annual air temperature in Serbia would be increased by 3-4°C, while the rainfalls would be reduced by about 22% [42].

An increase in the mean annual air temperatures and the decreasing trend in the annual rainfalls' sum, followed by increasing long dry periods, as well as an appearance of a new absolute temperature records, indicate that it could be expected the trend of rapid decomposition of organic matter in the soil, reducing the average long-term water flow rates at the national level,[78] yields' reduction in agriculture in the long term and intensive attacks of plant diseases and pests, phenological changes, i.e. changing of the time for biological processes during the year[79] as well as changes in number and distribution of the plant and animal species and habitats in the nature.

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[77] According to RHMS data, intensity of trend in annual air temperature for the 1975-2004 period amounted to 4.54°C/100 years [35].

[78] Results of several climate models (NCAR, MPI and RegCM) point to the possible reduction of the average long-term flow rate, by 12.5% until 2020, and by 19% until 2100 (in the vegetation period by 11.1% and 5.4%, respectively) [28].

[79] See more in the Report EC-JRC AVEMAC Project-a (2012), http://mars.jrc.ec.europa.eu/mars/Projects/AVEMAC.

Agriculture is also the sector that significantly contributes to the greenhouse gas emissions. The Government is engaged in an analysis of agriculture contribution to the GHG emissions as well as to the mitigation measures within the commitments undertaken by the ratification of the UNFCCC (2001) and the Kyoto Protocol (2008). Measures of adaptation have been also discussed in the Initial National Communication of the Republic of Serbia under the UNFCCC (2010), but still there are no results in their development at national and sectoral level, as well as in the horizontal and vertical implementation.

5. POLICIES OF SUSTAINABLE NATURAL RESOURCES MANAGEMENT IN AGRICULTURE UNDER CLIMATE CHANGE

As highlighted in the introduction of this chapter, Serbia as a candidate country for EU membership, during the pre-accession period has done a lot on harmonization of legislative with the relevant EU one, in the field of sustainable use of natural resources. Initial results are visible in domain of fulfilment the obligations according to the signed international conventions in this area (UNFCCC, UNCCD, UNCBD, etc.).

However, the delay in the adoption of bylaws and strategic planning documents in the areas of adaptation to the climate changes and in combating against land desertification and degradation, non-inclusion of climate changes' issues into the sectoral sustainable development strategies and programs, as well as undeveloped initiative at the local level, clearly indicate that the achieved results represent more the partial responses to the requests from abroad, than the wise designed and comprehensive policies at all levels.

According to the ***Law on Environmental Protection*** (Official Gazette of RS, 36/09), the strategic planning for sustainable use and protection of natural resources is provided in the *Spatial Plan of the Republic of Serbia* and the *National Strategy for Sustainable Use of Natural Resources and Assets*. According to the Spatial Plan, sustainable use and protection of natural resources are among the major objectives of the country spatial development. The Strategy for Sustainable Use of Natural Resources and Assets (Official Gazette of RS, 33/12) analyses the availability and management of the natural resources of the country and creates a long-term policy framework for their sustainable use. The National Strategy is implemented through the plans and programs for each natural resource, adopted by the Government.

Protection, development and use of agricultural land are regulated by the ***Law on agricultural land*** (Official Gazette of RS, 62/2006, 41/2009). The law is regulating the issue concerning change of use and fragmentation of cultivable agricultural land; prohibition and control of agricultural land and irrigation water contamination by hazardous and noxious substances; undertaking of erosion control measures; conducting of fertility control for cultivable agricultural land as well as the control of mineral fertilizers and pesticides amount applied; and prohibiting of the crop residues' burning. In domain of agricultural land reclamation there have been foreseen the measures of land consolidation, voluntary grouping as well as agro and hydro melioration. The owner or user of agricultural land ensures sustainable use by regular cultivation and grazing and/or mowing, according the rules of good agricultural practices and in accordance with the national and provincial agricultural bases.

The agricultural bases for protection, reclamation and utilization of agricultural land represent the basic planning documents, which are synchronized with the spatial, master and other planning documents, as well as mutually, and they are implementing through the annual programmes. However, their adoption as well as the adoption of codes for good agricultural practice has been delayed.

The Manual *Regulations on good agricultural practices for management of manure coming from agriculture and organic fertilize*r, has been elaborated within MAFWM DREPR Project,[80] containing practical measures to reduce the discharge of nitrogen and phosphorus in surface water and groundwater and ammonia emissions, and to reduce the risk of pesticide use and land degradation, has got, as the whole project, the unexpectedly good response from the Serbian farmers. This fact encourages and urges the immediate adoption of the good agricultural practice codes, whose measures to a large extent correspond with measures of the climate change mitigation by reducing emissions of GHGs from agriculture, especially in the zones of intensive agriculture.

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[80] Serbia Danube River Enterprise Pollution Reduction Project - DREPR project (2006-2010) is financed under the GEF-WB Investment Fund for Nutrient Reduction in the Black Sea/Danube Basin and implemented in the regions of Požarevac and Šabac in Central Serbia, and Novi Sad and Vrbas in Vojvodina. The Project's main objectives were introducing good agricultural practices and promotion of environmental protection, in addition to protection of the Danube River water flows and its tributaries from nutrient pollution. According to WB and MAFWM data, with more than one hundred farmers enlisted for project activities, the project falls into the category of the most successful agriculture related projects in the Republic of Serbia, http://archive.iwlearn.net/www.drepr.org/indexeng.htm.

In HNV agricultural areas priority should be given to the agri-environment measures supporting farmers in conservation of natural resources and agro-biodiversity as well as for development of extensive production [38; 40].

The Law on Incentives in Agriculture and Rural Development (Official Gazette of RS, 10/13) provides support for agri-environment measures and obliges the incentives' beneficiaries to respect the regulations governing standards of environmental quality and public health, animal and plant health, and animal and agricultural land welfare.

The National Rural Development Programme 2011-2013 (Official Gazette of RS, 15/11) provides during this period only the budget support for organic farming[81] and preservation of indigenous breeds of domestic animals, while introduction of other agri-environment measures, similarly as done in EU RDP, is expected in the next programming period.

Similar to the above-mentioned Manual of good agricultural practices, even in this case the initiative has been taken by foreign organizations and donors, so within IUCN Project *Support for Agri-environment Policies and Programming in Serbia* (2008-2010) it was made the publication *Developing a National Agri-Environment Programme for Serbia*, in which it is proposed to provide support schemes for:

- keeping of autochthonous breeds on the mountain, sandy, salty or wetland grasslands,
- restoration of traditional mountain pastoralism in protected areas,
- restoration and management of HNV grassland and maintenance of habitats of protected species in arable land of Important Bird Areas,
- conversion and production by organic method, maintenance of traditional orchards, and crop rotation and soil erosion control for protection of land and water, in the entire territory of the country.

These measures are vital for the preserving of agro-biodiversity, erosion protection, conservation of water quality and carbon sequestration [5].

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[81] Organic production (areas in the organic status and in the period of conversion), including areas used for the collection of wild berries, mushrooms and medicinal herbs, according to recent research (2012) is taking place in Serbia on 829,000 hectares. Almost 11,100 ha of those areas is agricultural land under orchards (46.4%), field crops (41.3%), meadows and pastures (7.6%) and vegetables (4.8%) [29]. Organic livestock husbandry is still a large unused opportunity of Serbian agriculture [23], while it is encouraging tendency of a growing number of animals in conversion period [29].

The Law on Water (Official Gazette of RS, 30/2010) is following the requirements of the EU Water Framework Directiveand defines the principle of integrated water resources management at the level of the river basin[82], on the principle of sustainable development. Integrated water management involves the maintenance and improvement of the water regime, provision the necessary amount of water of the required quality for different purposes, protection against pollution and protection against harmful effects of water. Operationalization of the water management measures is done by the long-term and annual programmes for the respective water districts, at the national, provincial and local level.

Agriculture is directly interested in participating in the implementation of measures related to the following: flood control and the harmful effects of erosion and flood, utilization and quality control of water used for irrigation, and the protection from pollution of the surface and groundwater, including the transboundary impacts. The irrigation management, or rather the reform of irrigation management system is particularly important for agricultural development in the conditions of climate changes. It implies an *integrated approach of technical and managerial upgrading of irrigation schemes combined with institutional reforms*[83] *with the objective to improve resource utilization (labour, water economics, environment) and water delivery service to farms* (FAO Concept of Irrigation Modernization[84]) [17].

The Republic of Serbia concluded with the IBRD/IDA Development Credit Agreement (2005) and Additional Financing Loan Agreement (2007) for financing *Irrigation & Drainage Rehabilitation Project* (P087964) in 2005-2013. According to Implementation Status & Results Overview (June 2012), major bottleneck occurs in relation to the transfer of competencies from the public water companies to water users associations (WUAs) [59].

The Law on Water provides possibility of establishment the ***water users' associations*** in accordance with the special law, made by the interested parties in the melioration area or part thereof, in order to ensure the

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[82] According to the Law on Water, the *water district* consists of one or more neighbouring river basins and sub-basins or their parts on the territory of the Republic of Serbia, together with associated groundwater.

[83] Irrigation Management Transfer is defined by FAO as the (full or partial) reallocation of responsibility and authority for management of irrigation systems from government agencies to non-governmental organizations such as water users' associations (WUAs) at irrigation system or subsystem levels.

[84] The irrigation modernization refers to both irrigation and drainage related actions.

conditions for the various uses of water and protection from the damaging effects of water. Work on drafting legal documents that will regulate WUA's functioning are on-going, but with significant delays. It is expected that by these documents it will be enables even the establishment of the Federations of the water users' associations (FWUAs), given the experience of neighbouring countries with a developed network of WUAs, according to which better irrigation services and participation in decision making will only be possible by federating WUAs at scheme level and preparation for future steps to provide representation in the river basin councils, as basis for real irrigation management decentralization. Experience in the region are in favour of the establishment of multifunctional WUAs, that would, among other things, take care on the sustainable use and protection of land and water (drainage, flood protection, anti-erosion measures) [55].

In that case, these associations could cover to some extent even the measures of adaptation to climate changes in agriculture, and in this direction there should be encouraged their activation and strengthening as soon as possible. FAO experts recommend land users to organize in ***Local Resource Management Groups (LRMGs)***, supported by off-site land specialists from extension, university and R&D institutions, NGO, government and international organizations. ***Participatory land-use planning*** then becomes interactive, mutual learning process, based on scientific knowledge from government and off-site specialists and the experience and traditional knowledge of local land users. To be fully effective, LRMGs should be legal entities with a recognized mandate [18].

CONCLUSIONS

Irrespective of the form of institutional organization, the sustainable and climate-smart agriculture and management of natural resources in agriculture require the ***site-specific approach*** [39] and active participation of local stakeholders in the planning and implementation of measures within a defined ***strategic framework at the national level*** together with provided support of scientific and research sector, extension and advisory services as well as the budget and financial institutions.

Serbian agriculture has long been operating without a strategic development document. Given that the activities on the strategy of agricultural development in Serbia for the period 2014-2024 are

underway, this is a good opportunity for an inclusion of the climate changes' items and defining the ***sectoral adaptation plan*** in the text of the new Strategy of agricultural development, using the multi-sectoral approach and synergy effects[85] of adaptation and mitigation measures, as well as the measures of land, water and biodiversity protection.

Starting from the EU legislation and practice [3; 4] and the solutions contained in the National Communication under UNFCCC [28], possible climate change measures in agriculture to be applied at the ***local/sectoral level***, could be systematized in to the following sets: *sustainable soil management practices*, *sustainable bio-physical processes management techniques*, *technological and infrastructural solutions* and *socio-economic and policy responses*[36].

Sustainable soil management practices in climate change **adaptation** aim to prevent erosion and optimizing water resources by keeping soil moisture (management of crop rotations and crop residues, permanent vegetation cover, tillage reduction methods, green infrastructure maintenance and afforestation of marginal and degraded agricultural land).

Sustainable bio-physical processes management techniques foster resilience to changing vegetative cycle, heat stress and water shortage, and pest and disease risk (compliance of sowing dates and pesticide and fertilizer treatment dates and methods and use of crops and varieties better adapted to the new growing conditions, more heat-tolerant livestock breeds and diet patterns suitable for heat stress conditions).

Technological and infrastructural solutions in adaptation to climate change include: maintenance of flood protection system, investing in new irrigation and drainage systems, improving irrigation practices and reducing water losses; investing in ventilation and cooling systems in animal shelters and equipment for protection of orchards from wind, heal and frost damage; adaptation of crop varieties using existing genetic diversity and biotechnology improvements; climate and pest and diseases risk monitoring and modelling, development of early warning systems of droughts and other extreme weather events, use of integrated pest management, and agricultural advisory and RHMS agrometeorology service capacity building.

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[85] With careful management of potential trade-offs.

Socio-economic and policy responses to climate change imply: diversification of farm activities, development of risk and crisis management, yield insurance instruments and climate, water and other agro-environment payment schemes, land use planning, adoption of sectoral adaptation plan, improved intersectoral cooperation and public awareness.

In the area of climate change **mitigation,** these sets should contain measures as follows.

Sustainable soil management practices **-** prevent erosion and carbon losses from the soils and enhancing soil carbon levels (diversified crop rotations, permanent vegetation cover, catch crops, conservation agriculture practices, organic farming, precision farming, traditional agriculture, grassland improvement, restoration of wetlands and peatland and afforestation of marginal and degraded agricultural land).

Sustainable bio-physical processes management techniques- reduce methane and nitrous oxide emissions (efficient nutrient cycling and manure management, improved diet patterns of animals).

Technological and infrastructural solutions are directed to the use of biomass supply and anaerobic treatment of animal manure for renewable energy purposes.

Socio-economic and policy responses aim to diversify farm activities and develop climate agro-environment payment schemes and capacity building relating to Kyoto Protocol's Clean Development Mechanism (CDM) projects implementing and financing.

Implementation of the measures aiming at adaptation and mitigation of climate changes at the farm level usually results in an initial decrease in revenues, i.e. it requires some investments and time for pay-back of invested funds. If in the interim period there is no any government support, motivation of farmers for participation in the programs of adaptation and mitigation is being reduced. Subsidized loans for the purchase of equipment and inputs, subsidizing of the crop and livestock insurance, support for strengthening of the producers' associations [57], as well as the solving important items in domain of land tenure [37], would greatly help the farmers to take care, in a new and better way, about conservation of natural resources in the conditions of climate changes.

An awareness of farmers that stewardship of natural resources is in their own interest, i.e. in the interest of preserving the conditions for sustainable development of agricultural production in the future, has existed for the centuries. Farmers have always cared about the land, water, plants and animals, on the farm and in close environment, and they have adapted to climate conditions. But, the changes become too complex and transition too exhausting, so it become necessary for the farmers the stronger institutional and financial support of the state, as well as the technical assistance of science and extension advisors.

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TERRITORIAL CAPITAL OF RURAL AREAS: AN EXAMPLE OF ANALYSIS OF THE POTENTIAL FOR RURAL TOURISM DEVELOPMENT IN SERBIA

INTRODUCTION

In order to understand society and its development it is necessary to analyse the relevant factors that may affect the rate, the course and the consequences of social changes in rural areas. Due to specific context and the importance of rural development we need to consider the complexity of different levels of analysis and policies (national, regional and local), as well as the specific features of heterogeneous rural areas that need to be reflected in territorial policies of rural, i.e. regional rural development. From the historical point of view, different policies pertaining to rural areas had different objectives and were based on different grounds: natural resources, technological development and transfer, human resources, economic capital, social capital and social networks, etc. The concept of territorial capital requires adequate usage of territorial policies in order to transform the dimensions (capitals) of territorial development, i.e. to employ them with the purpose of the development of certain areas.

At the beginning of this study, it is important to, at least in general, place the perspectives of rural development policies and practice within the framework of endogenous and exogenous factors of rural area development. Previous development models were evidently exogenous, and their exogenous nature was especially evident in the paradigm of modernisation of agriculture and sectoral policies (primarily agricultural policies). Also, the exogenous approach was reflected in the centralist nature of planned measures and their implementation, control and managing of the processes of economic growth and development of rural areas. In rural areas, this usually refers to the process of modernisation of agriculture or some other sector, industrialisation and urbanisation [19]. These processes, exogenous by themselves in relation to rural areas, have caused the whole range of social changes in rural regions. Some of the main characteristics of the prevailing exogenous approaches is that (exogenous) development is transplanted into particular locales and externally determined; it tends to export the process of development from the region; it tends to trample over local values and disrespects them [31].

Altogether, some of the critics of exogenous approaches in rural development insisted that these approaches often are: "dependent development, reliant on continued subsidies and the policy decisions of distant agencies or boardrooms; distorted development, which boosted single sectors, selected settlements and certain types of business (e.g. progressive farmers) but left others behind and neglected the non-economic aspects of rural life; destructive development, that erased the cultural and environmental differences of rural areas; dictated development devised by external experts and planners" [21].

In contrast to exogenous (external) models of social development, there are, logically, endogenous (internal) models. In this duality of development models, the endogenous development is determined by: internal forces and resources, endogenous initiative, participation of local forces in decision-making and in determination of the directions and dynamics of development. Unlike exogenous development, endogenous development tends to keep the benefits of development within the local (regional) economy, and to respect the local values in the process of development [32]. The key principles, which have promoted the idea of endogenous approach, are reflected in the fact that „the specific resources of an area (natural, human and cultural) hold the key to its sustainable development", while "main dynamic force represent local initiative and enterprise". Since the main problems were related to "(the) limited capacity of areas and social groups to participate in economic and development activity, focus of rural development was on capacity-building (skills, institutions, local networks and infrastructure) and overcoming social exclusion" [21]. The synthesis of the both models in the *neoendogenous* concept can be presented as an attempt to emphasise the necessity of territoriality in rural development, primarily through satisfying the local needs, participation and gradual decentralisation. This means that the local/regional needs are the starting point for development activities; participation encompasses a multitude of (local and external) actors and networks, but also responsibilities, which, in turn, can latently lead to greater cohesion, solidarity, identity development and boosting of all kinds of capacities at the local and regional level. Exogenous activation of local dynamics and potentials (EU LEADER initiative is a typical example), as well as cooperation with exogenous actors, financial and other institutions, in most cases is an inseparable segment of rural development. From the perspective of neoendogenous model, the development based on local resources and participation can be animated in three directions [21]: within the local area, from the intermediate

(secondary) level and from above – from the global level, while the critical point is how to enhance the capacity of local areas to steer these larger processes and actions to their benefit.

In a one of the most important EU document dated as early as late 1980s, *The future of rural society*, it was pointed out that: "*local rural development does not mean merely working along existing lines. It means making the most of all the advantages that the particular rural area has: space and landscape beauty, high-quality agricultural and forestry products specific to the area, gastronomic specialities, cultural and craft traditions, architectural and artistic heritage, innovatory ideas, availability of labour, industries and services already existing, all to be exploited with regional capital and human resources, with what is lacking in the way capital and coordination, consultancy and planning services brought in from outside*" [13].

The aim of this paper is to emphasise an possibility of applying these theoretical frameworks on rural areas in Serbia. For this purpose, the results of empirical research on the possibilities of rural tourism development in Serbia were analysed in four case studies: the region of southern Banat, central Serbia, eastern Serbia and the lower Danube region. The main hypothesis is that successful development of this sector and these regions can be achieved only if the national, regional and local policies adequately reflect the development potentials, needs and constraints. By respecting specific dimensions of different territorial capital, it is possible to create adequate policies for development of local rural economies (as well as adequate environment for development in general), but it is also possible to generate ideas for encouraging social partnerships and integration, following the example of LEADER initiative in the European Union. Rural development policies implemented in Serbia so far have not devoted enough attention to the issues of heterogeneity of its rural territories and to the need to acknowledge and encourage this diversity in an appropriate way. Serbia, in this respect, resembles many transition countries which, due to the lack of their own policies resort to uncritical adoption of solutions from other regions or other countries (so-called *copy-paste* solutions), which are most frequently not optimal for heterogeneous problems of rural areas.

The methodology of this research is based on application of desk research approach and official statistical data processing, as well as analyses of the

available and the authors' own results of empirical research gathered in focus groups, through surveys and semi-structured interviews within the project *Sustainable Tourism for Rural Development*, more in [21].

1. TERRITORIAL APPROACH TO RURAL DEVELOPMENT

The issue of regional rural development is clearly connected with the territory, which is not necessarily defined by its strict administrative demarcations. The territory is characterised by its functions, relatively similar and integrated economies, socio-cultural identity, and so on, which constitute a comparative advantage of that territory over other areas, i.e. regions. In social theory, the concept of *territorial competitiveness* is widely used and, apart from its economic meaning in the sense "the ability to withstand market competition", it also refers to proving ecological, social and cultural sustainability of a certain area. Some approaches to this issue (LEADER) distinguish four dimensions of territorial competitiveness: "*social competitiveness" or the ability of participants to act effectively together on the basis of shared project concepts encouraged by cooperation between the various institutional levels; "environmental competitiveness" or the ability of participants to make the most of their environment by making it a "distinctive" element of their area while ensuring that their natural resources and heritage are preserved and revitalised; "economic competitiveness" or the ability of participants to create and retain the maximum added value in areas by strengthening the links between sectors and turning their combined resources into assets for enhancing the value and distinctiveness of their local products and services; "positioning in the global context" or the ability of participants to find an area's role in relation to other areas and the outside world in general, in such a way as to develop their territorial plan to the fullest and ensure its viability within the global context*" [20].

In addition to social, economic and ecological dimensions, certain authors also include a political-institutional dimension [28]as well as a cultural dimension of rural development [25]. Ray [29] points to the so-called approach of "culture economies", which arises from three sources: "the changing nature of post-industrial consumer capitalism, the trajectory of rural development policy in the EU, and the growth of regionalism as a European and global phenomenon". This approach assumes that culture is the basis of territorial identity, whereas culture

very broadly refers to the whole range of markers such as different languages and dialects, food, folklore, crafts, historical heritage as well as (specific) natural environment. At the same time, in terms of production, a certain territory is focused on preservation and/or developing of territorial identity, which is valorised through a variety of products and services offered to those who use a rural area and to "consumers". The notion of "commodified rural spaces" refers to material and nonmaterial conceptualisations of the rural, and each one has its own constructivist basis and consequences (which is the case with branding in general). However, the question is whether these constructions marginalise the problems existing in rural areas (poverty, deprivation and the like), more in Cloke et al. 1994, in [14]. From the sociological perspective, "territorial competitiveness" should not be understood too narrowly, i.e. strictly in economic terms, as a means leading to increasing competitiveness of a certain area at the global (market) level. Territorial competitiveness should be understood in terms of a region that represent a framework in which actions and decision-making take place based on the willingness and aspirations of the "local" population and on regional proximity. This framework actually represents "an experiential basis serving as a structural basis for developing awareness of responsibility", "competencies for acting and controlling", and possibilities for *intra*-regional and *inter*-regional cooperation and exchange of experience (and not for strengthening autocracy and/or protectionism), as a means for minimising the effects of global markets etc., more in [24]. Rural development is a broader framework than regional development, because rural development includes not only the regional approach, but also the whole range of sectoral approaches, as well as approaches from the local level. The notion of rural development can be understood to include the "interventions" planned by the state, but partly also the positive social changes that more or less spontaneously occur in the historical development of rural areas, usually influenced by the processes of modernisation, industrialisation and urbanisation of society. The need for intervention in rural (development) policies arises from the necessity to reduce poverty and social inequality of rural population, but also from the need to achieve equal development in the entire area of a certain society. Although reduction of rural poverty is often incorporated as the basis that determine rural and regional development [28], similar in [12], certain authors claim that reducing poverty is the main objective of rural development, both in developing and developed countries, de Janvry *et al.* 2002, in [5].

According to certain opinions, regional rural development is essentially oriented to people with the purpose of reducing mass rural poverty [28], which can be achieved by optimal development of the abovementioned dimensions within a smaller or larger territory. Although systematisation of the main conceptual approaches in strategies of rural development can refer to sectoral, territorial and human approach (oriented to rural population) [5], sociological perception of this issue devotes special attention to the fact that the territorial approach, oriented to the potentials i.e. competitiveness of a certain area, is basically an approach focusing on broadly understood *capabilities of the actors/population*. This complements the conclusion that actors in a particular rural area (together with social institutions and organisations in the area) have to recognise and exploit the potentials they have and take collective action to try to overcome the limitations of the area where they live and work. In this sense, reducing mass rural poverty can be seen as a consequence of rural development [16].

The importance of "local" rural development emerged as early as in late 1980s in the aforementioned document of the European Commission *The Future of Rural Society*, which pointed out the need of external support (rural development policy) to endogenous potentials of rural areas. Endogenous potentials and local-territorial approach to rural development in the policies of the European Union were a step forward in understanding that agricultural policies that dominated rural policies (together with other, usually separated and often uncoordinated, sectoral, measures) failed to achieve the equal results in terms of reducing poverty and inequality in different rural areas. This led to the crucial issue of identifying the reasons why some planned social changes and projects fail to contribute to the development of certain areas. It seems that this indicated the complexity of the issues of rural development, primarily at the level of planning and understanding rural development as *a process*. The complexity of this problem was brought to light by raising the issues of social networks, interactions, power relations of actors and institutions, participation, local resources and knowledge/skills, different types of capital that rural areas have and, perhaps even more importantly, that they use in different ways for the purpose of their own development [17].

A region, as a development category, need to provide a position for systematic development of a settlements network, adequate economic and spatial redistribution of economic capacities, subsidiary distribution of power, authority – as support to local and regional initiatives – and

responsibility for certain development activities. Although there are regions of different sizes (as well as local self-governments of different sizes), a region represents an optimal framework for integrated and sustainable management of socio-economic, demographic, cultural and ecological development of a certain territory [15]. Also, regions represent the best compromise between fragmented local initiatives and "distant" global national development plans. A regional framework allows for the possibility of integrated development; in other words, it provides the best framework for potential realisation of the synergy effect of local development initiatives, together with the support provided by the system of global (national) measures of development support. Integrality, as a principle, would involve: constructive connecting at the level of internally perceived common interests, needs and possibilities for development; connecting at the level of mutual initiatives and actions (social actions) and exploitation (or creation) of social capital; sustainable management of socio-economic and ecological development and effective "local" implementation, monitoring and evaluation the of the desired objectives of development.

2. A CONCEPT OF RURAL TERRITORIAL CAPITAL

Territorial capital was introduced in a context of a regional policy by the OECDs' *Territorial Outlook.* This document identified that "prosperity is increasingly a matter of how well each city or region can achieve its potential. Territorial capital refers to the stock of assets which form the basis for endogenous development in each city and region, as well as to the institutions, modes of decision-making and professional skills to make best use of those assets" [26]. EC confirmed this statement saying: "*Each region has a specific 'territorial capital' that is distinct from that of other areas and generates a higher return for specific kinds of investments than for others, since these are better suited to the area and use its assets and potential more effectively. Territorial development policies (policies with a territorial approach to development) should first and foremost help areas to develop their territorial capital*", European Commission, 2005: 1, cited in [10]. According to Brunori [7], [8] territorial capital can be defined as the interaction among all the material and non material, private and public assets characterising a territory where territorial governance is the process of combining the interactions and the interests of the different actors and their ability to use, combine and transform local assets [22].

From the analytical point of view, territorial capital comprises all factors accessible in the area, both tangible and intangible, which can be observed as the assets as well as development constrains. The territorial capital refers to the things that constitute an area's assets (activities, landscape, heritage, know-how, etc), and are not a part of an accounting inventory exercise, but are intended to identify the distinctive features of an area whose value can be enhanced [20]. In terms of qualitative descriptions, measurements and quantifications of the territorial capital of a certain area, the literature provides different taxonomies of the components of territorial capital, as well as indicators used for its describing and measuring.

	Old approach	*New approach*
General Objective	Production and economic growth	Sustainable management of local resources
Specific Objectives	Farm income, farm competitiveness	Competitiveness of rural areas, valorisation of local assets
Key target sectors	Agriculture	Various sectors of rural economy
Main tools	Subsidies	Investment
Key actors (individual)	Farmers	Rural entrepreneurs
Strategic competencies of individual actors	Farm management and farming methods	Entrepreneurial vision, integration of agriculture with other activities
Key actors (institutional)	National governments	All levels (supra-national; national; regional; local)
Institutional approach	Top down (Government)	Bottom up (Governance)

Table 1: A new paradigm for rural development policies
Source: [22]

Initially, this approach based on the territorial assets was elaborated in a local development framework, and was not directly linked with rural growth. The physical, financial and natural capital, the social and cultural context and political relevance for local development, were considered as

seven core elements of local and regional development. An increased recognition of the importance of this approach in addressing development challenges of rural areas caused new systematisation and elaborations of links between the various components of territorial capital. Therefore, EC [20] proposed eight components of territorial capital that are directly linked to the four types of territorial competitiveness (Table 2).

	Environmental Competitiveness	*Social Competitiveness*	*Economic Competitiveness*	*Positioning in the global context*
Physical resources - **i**n particular natural resources, public facilities and infrastructure, and the historical and architectural heritage;	**X**		**X**	
Human resources - the men and women living in the area, those who take up residence there and those who depart from the area, the population's demographic characteristics and its social structure	**X**	**X**		
Culture/Identity - the shared values of the players in the area, their interests, attitudes, forms of recognition, etc.		**X**		
Know-how/skills as well as technological mastery and research and development capabilities;		**X**	**X**	**X**
Governance and financial resources the political rules of the game, the collective players involved; the "**governance";financial resources** (institutions, businesses, people, etc.) and their management (savings, loans, etc.),		**X**	**X**	**X**
Activities and business firms, their degree of geographical concentration and their structure (size of firms, sectors, etc.);			**X**	
Markets/External relations especially their integration into the different markets, exchange and promotion networks, etc.;	**X**		**X**	**X**
The **image and perception of the area** both internally and externally.	**X**			**X**

Table 2: Four types of territorial competitiveness
Source: authors' elaboration based on [20]

Camagni [10] provided a theoretical categorization and arrangement of 'territorial capital' by an extended version of role of basic capitals in the development process. His concept categorises all potential sources of territorial capital in a three-by-three matrix, built upon the two magnitudes: rivalry and materiality (Figure 1). The most important and innovative aspect of this solution is that it seeks to incorporate hard and soft elements and puts the capacity "to convert potential relationality into effective relationality and linkages among economic agents" into the centre of the regional policy system, labelling the middle classes of the matrix the 'innovative cross' [10].

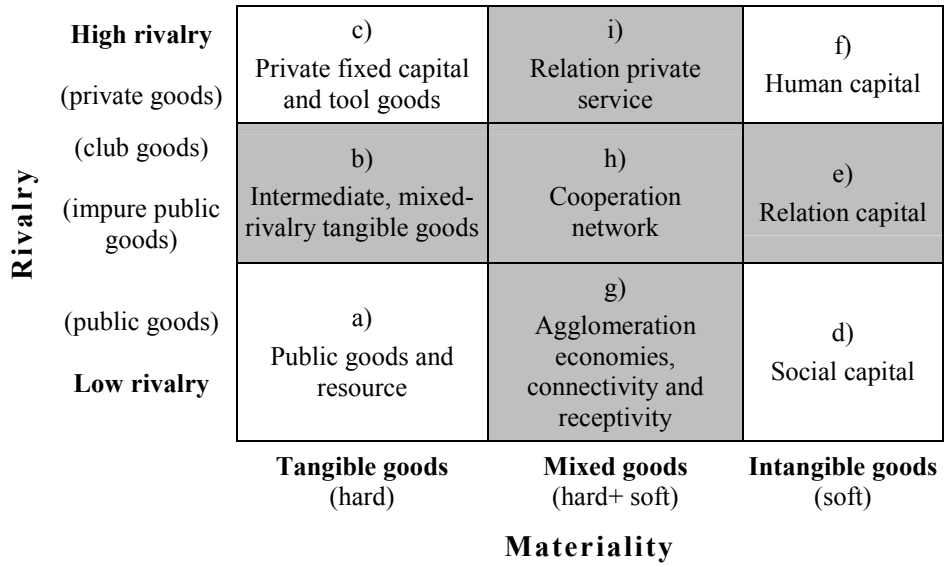

Figure 1: A classification of territorial capital according to materiality and rivalry
Source:[10]

The FP7th project IAREG[86] analysed diverse characteristic of territorial capital with particular attention on the assessment of the "intangible assets" for regional performances. An important conclusion of this research is that intangible assets are essential in determining regional performances. Besides, the authors stressed that there is considerable

[86] IAREG - Intangible Assets and Regional Economic Growth.

tendency to "increase the share of intangibles over tangibles, confirming the growing role of knowledge capital in the competitive behaviour of the firms" [33].

Though this classification of territorial capitals is a clearly structured theoretical taxonomy that is characterised by a two-dimensional structure, there are significant overlaps between the categories and difficulties in allocating policy action to a specific "type" of territorial capital. It thus seems relevant to alert decision makers on the different capital dimensions and raise understanding of "relational" activities, but not a suitable template for developing policy proposals. Paying particular attention to activities that go beyond the 'traditional' ones also links to the need to translate abstract potentials into actual assets. This provides a detailed reference for addressing the inter-relatedness of places, as characterised by the overarching theme of "connexity".

The EDORA project[87] analysis in many respects refers to the activities addressed within the innovative cross, i.e. the linking activities of territorial capital enhancement. This presentation of the inter-linkages of capital resources as the innovative elements can be seen as an option to map the various types and aspects of capitals available/required in development processes. Taking this concept as an analytical tool for analysing, e.g. case studies like the exemplar regions in this project, reveals the difficulty to attach the various elements and action to the specific boxes of this schematic presentation.

The relations between different forms of capital were analysed also by Buordieu, who, realising the characteristics of social capital, considered its relations with other forms of capital – economic and cultural-symbolic capital [9]; [6]. According to Buordieu: "the volume of the social capital possessed by a given agent depends on the size of the network of connections he can effectively mobilize and on the volume of the capital (economic, cultural or symbolic) possessed in his own right by each of those to whom he is connected. This means that, although it is relatively irreducible to the economic and cultural capital..., "social capital is never completely independent of it" [6].

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[87] EDORA: European Development Opportunities for Rural Areas Led by UHI Millennium Institute, Inverness, Scotland; EDORA is the project of ESPON - the European Observation Network for Territorial Development and Cohesion.

In the sense of mobilisation of social capital, A. Portes [27] also claims: „to possess social capital, a person must be related to others, and it is those others, not himself, who are the actual source of his or her advantage“. Therefore, according to Buordieu, it is important that social capital is connected with other forms of capital, while economic capital is essentially the most important and is at the root of all other forms of capital. If we observe the relationship with social structure, it follows that possession (and access to different forms of capital) is unevenly distributed. This indicates that there is a need to analyse the ways in which social capital can be combined and transformed in other forms of capital, see [18]. For these reasons, by having insight into the dimensions of territorial capital in selected Serbian regions we can discover and use the potential connections and potential transformations of different types of capital in order to develop a case study of the regions.

3. TERRITORIAL CAPITAL OF RURAL AREAS AS POTENTIAL FOR DEVELOPMENT OF RURAL TOURISM IN SERBIA

3.1. Serbia – Diversification of Rural Territory

The discussion about future rural development policy of Serbia, particularly in terms of its adaptation to the EU policy framework, raises the interest of policy makers in the diversity of rural areas. Hence, the diversity of rural Serbia is becoming more recognised as one of the key development factors [1]. This diversity comprises at the same time richness and a major challenge for the policies dealing with rural issues [34]. Diversity of rural Serbia is driven by many factors, whereby particular emphasis is on the variety of natural resource endowments, cultural and historical heritage, as well as economic, social and demographic patterns. Hence, both researchers and policy makers seek for new development approaches based on regional diversity in order to achieve better usage of the development opportunities and act in response to challenges of diverse types of rural areas [4]; [30].

Bogdanov, Merediht and Efstratoglou [3] studied the diversity of rural Serbia in order to define the homogenous types of rural regions. Distinguishing factors included geographical characteristics (mountains,

plain areas, valleys), accessibility (areas adjacent to cities, remote areas), population fluctuations and migration, infrastructure, differences in environmental conditions (e.g. protected areas), variations in agricultural systems and productivity, a degree of diversification of local economies (activities such as tourism, processing, manufacturing), etc. Based on the above, a typology of the rural areas in Serbia was constructed using those variables which accounted for the greatest differences between areas. The following thematic or sectoral factors were considered as the most important: demographic structures, geographical characteristics, structure of the economy, and developments of labour market, agricultural systems, touristic potential and infrastructure. On the basis of all the analyses performed, it is concluded that the Serbian rural mosaic consists of four basic types of rural regions:

Highly productive agriculture and integrated economy (I) – The main natural characteristics of this region are flat, high quality land and rich water potentials. Compared to other rural regions, it is characterised by more favourable demographic trends. This is proved by advantageous indicators such as aging ratio, educational structure and positive and high in-migration ratio. Economically, the region is characterised by a well-integrated economic structure dominated by food and chemical industries. The region of highly intensive agricultural production is characterised by remarkably rich soil potential - the arable land per capita is 1.08 ha (10.37 ha per the employed in agriculture). The more favourable land/man ratio enables sound agricultural productivity in this area, which reaches over 30% above Serbia's average. The average yields per head and hectare exceed the national average by 20% (vegetables and some fruits) to 50% (industrial crops). The farm structures in this region are dual, polarised into big farms organised on the principles of modern management and, on the other side, a number of small and semi subsistence farms managed by farmers with some other gainful activity. Physical infrastructure is more developed than in other parts of Serbia, particularly with regard to the supply of electricity, water and gas, as well as the road network. On the other hand, the quality of water, sewerage and waste disposal is still inadequate. Public services (education and health) are adequate to meet the basic needs of rural population, but without innovative solutions and programmes targeting vulnerable categories (the elderly, the disabled, the poor, youth and women).

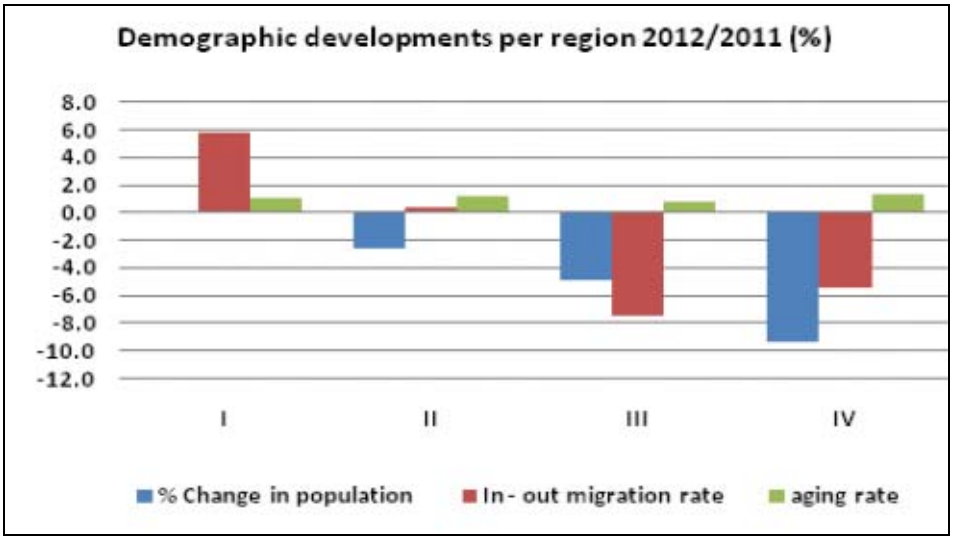

Figure 2: Demographic Development per region (I-IV)
Source: [5]

S*mall urban economies with labour intensive agriculture (II)* – This region covers the territory nearby the biggest urban centres. The regional economy is based on the industry (mechanical and chemical), agriculture, as well as trade and transport sectors. The main transport routes (both road and rail) pass through the territory of the region. The agriculture is dominated by intensive farming (the production of fruit, vegetables and livestock). The farm structure is dominated by small scale farms (average size is less than 3 ha) and a high concentration of the farms sized 3–7 ha (60% of the total number of farms). Hence, pluriactivity has been identified as a survival and/or capital accumulation strategy for the rural households in this region. Such model has resulted in higher activity and employment rates compared with other rural regions. Since the region is located near large urban centres, this rural area has a more favourable infrastructure and easier public service access. Availability of modern roads is at the national average (61%), and the road network is equally present in the entire area of the region.

High tourism capacities and poorly developed agriculture (III) – This region encompasses western parts of Serbia, with considerable tourism potential. The main tourism potential of the region lies in spas (Užice, Pribojska and Ovčarska spas), monasteries Studenica, Sopoćani, and Stari Ras (all of those are UNESCO protected), ethnic villages, ski centres, National Park Kopaonik etc.

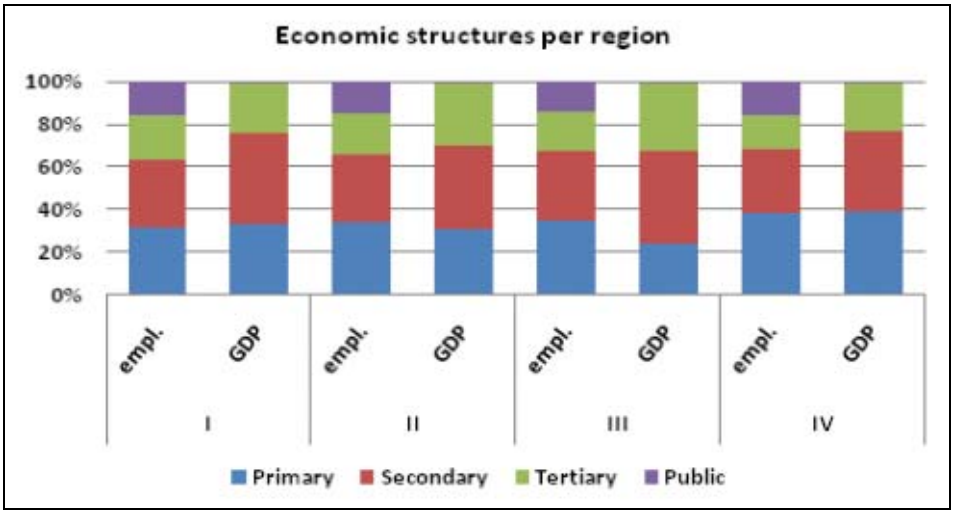

Figure 3: Economic structures per region (I-IV)
Source: [5]

The advantage of this region is that it spreads along the main roads toward Montenegro and Sarajevo, which gives rural areas some tourism advantages. A part of the region's GDP comes from mining as it contains energy and mineral resources. The industrial sector in this region is partially connected with its natural potentials (water supplies, wood production and processing, meat, vegetable and fruit processing). The tertiary sector contribution to the regional GDP is over 32%, out of which rural tourism makes up about 11%. The industry of this region has characteristics of mountainous economy: the hydropower plants, tourism and cattle breeding (particularly dairy products) are the traits of this region. The road network is well developed, but the quality of roads and other infrastructure capital is relatively low.

Natural resources oriented economies mostly mountainous (IV) – this region is highly heterogeneous in terms of its natural resources and geographical characteristics. The diversity of the landscape in these areas and the heterogeneous structure of natural resources have resulted in a fairly diversified industrial and agricultural structure. The economic structure is based on exploitation of natural resources, through mining and agriculture. Compared to the other rural areas, this region has the lowest population density (43 people per km^2). Unfavourable demographic trends are prominent, with the highest rates of rural poverty and unemployment in Serbia. The activity and employment rates in this region are the most unfavourable compared to the other rural areas, due

to the lack of the employment opportunities and inefficient labour market. Facilities for processing the produced raw materials are lacking, but their development offers a way to improve the local labour market.

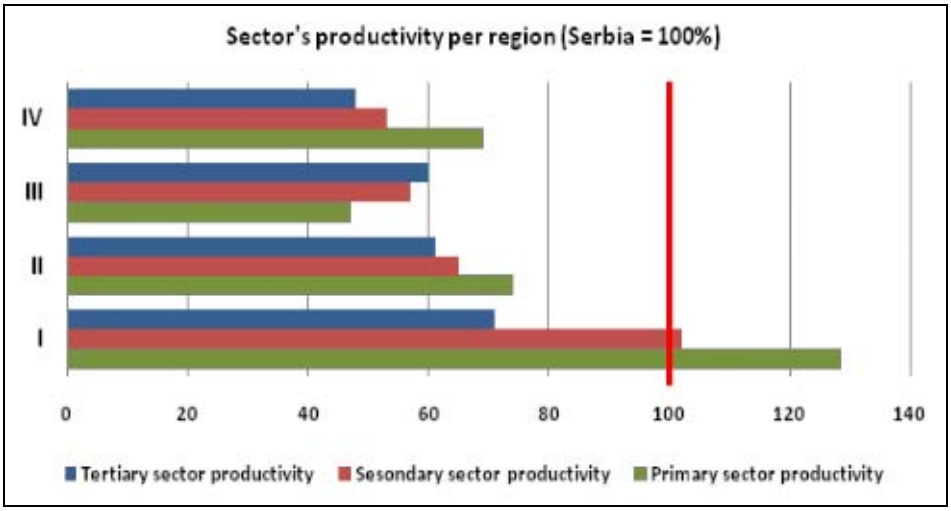

Figure 4: Sector's productivity per region (I-IV)
Source: [5]

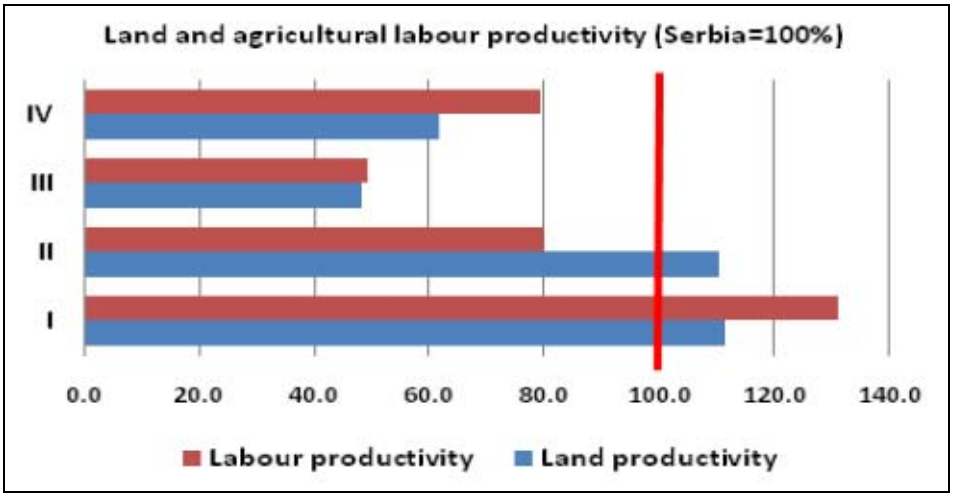

Figure 5: Land and agricultural labour productivity (I-IV)
Source: [5]

Such considerable differentiations in the basic development performance of rural regions require specific development strategies, which would be more oriented towards regional features.

3.2. Methodology of Estimating the Territorial Capital of Rural Regions

This part of the paper presents the results of case studies which evaluated different dimensions of territorial capital in four selected regions. The goal of this study was to determine whether the development of the existing dimensions of territorial capital in the selected areas is in line with the intended directions of rural tourism development in these areas.

A list of the selected indicators which served as an analytical framework for estimating the territorial capital is presented in Table 3. The values of the indicators were determined by interpreting the following data: results of surveys conducted with members of rural households engaged in rural tourism, interviews with local entrepreneurs who provide tourist services or are in other way associated with this activity, and interviews with focus groups formed by representatives of local authorities. On the basis of the interpreted results, every observed indicator was assigned a score within the range from 1 to 5 (1 being the least favourable, and 5 the most favourable value compared with the neutral response or the average value in case of quantifications).

Dimension	*Concept*	*Indicators*
Human capital	Personal abilities/skills, entrepreneurial potential	Age structure and educational structure Participation in educational programs and trainings related to standards of food safety and tourism Possession of specific knowledge and skills important for improving the economic position of households and / or an individual Being informed about the types of support for agriculture and entrepreneurship Recognising deficits in workforce quality and the need for further trainings
Social capital	Ability of working collectively; Mutual trust and connections/ties between groups; Networking between institutions and individuals / households	Recognisability/visibility of local actors in the tourist sector Strength, institutionalisation of cooperation between local actors Confidence and motivation of entrepreneurs for co-operation with local actors Involvement of women as decision-makers Relevance of social networks resulting from previous work experience
Economic capital	The extent and quality of resources, sources of household income;	The extent of physical resources (agricultural and tourist), compared with an average The quality of physical resources (accommodation facilities) Stability of income and their sources (income sustainability) Placement of local products through tourism Diversification of tourist services and facilities

Cultural capital	Forms of knowledge specifically linked to the area. Local heritage.	Typicality / recognisability of cultural and historical heritage and local architecture Typicality / recognisability of local products (local know-how) Participation of households in activities related to using local heritage Relevance of local brands for the tourist offer Assessment of the market potential for local products
Natural capital	Natural resources (water; air; soil; biodiversity; human pressure on natural resources)	Recognisability of specific local resources by local population; Attractiveness of local natural resources, and the possibilities of their use for tourist purposes; Diversification of natural resources Satisfaction with the state of the environment, waste management Current state of utility systems

Table 3: Territorial capital analytical framework for four case studies of Serbian region
Source: authors' elaboration

3.3. Results and Discussion

CASE STUDY OF SOUTHERN BANAT
HUMAN CAPITAL • The average age structure and educational structure of the household members engaged in tourism are more favourable compared with the regional average; • About 25% of households have members who have been educated in the fields of various quality standards, health and safety standards, etc. Also, 30% of the respondents reported that their household members have been involved in trainings and education in these fields; • Participation in educational programs is much broader and more diverse, which can be attributed to a more organised system of knowledge transfer in Vojvodina, more active extension service and a larger number of actors in the system of knowledge and technology dissemination; • As many as one third of the respondents have regular contacts with experts from the tourism industry or contact them when needed; • According to the respondents' assessments, there is a need for enhancing human capacities and the fields of knowledge and skills that should be improved are the fields of market, marketing and quality standards. • A high percentage of the respondents (73%) estimated that they were familiar with the support for agriculture and rural development, and each of the respondents knew at least something about the support measures of the Ministry of Agriculture, Forestry and Water Managements of the Republic of Serbia; • Importance of the workforce they have is not highly valued as a development potential by the respondents, unlike the inventiveness of their members which they value highly. Nevertheless, it is interesting that it was the activities that are highly dependent on the quality of human potential that the respondents identified as the activities that may lead to diversification of their income.

SOCIAL CAPITAL

- The majority of the respondents recognise the local government as the key actor in promotion of local products and tourist potential! In contrast to other regions, the respondents recognise the contribution of all local people in promoting local tourism, and not only those directly involved in this activity (preserving the tradition, environment, etc.).
- NGOs, the state and rural networks were the least recognised as promoters of local values and potentials.
- Only a quarter of the entrepreneurs state that the reason why they opt for local suppliers is the need to create local partnerships. Buying food and agricultural products on the local market is primarily motivated by practical reasons (proximity of the market – 38%). All the entrepreneurs believe that the products bought on the local market can be found elsewhere.
- The heads of the household who used to be employed indicate, more often than in other regions, that their prior work engagement was useful for starting a new business in terms of enhanced social capital.
- The key partner for the entrepreneurs is the municipality (much more than in other regions), followed by NGOs and other actors. The municipality is more focused on the problems in agriculture, and less in the area of tourism.

ECONOMIC CAPITAL

- The households engaged in tourism have smaller average size of households in comparison with the regional average; in comparison with other areas, the households in this region more often also have other types of physical capital, equipment, which can be used for diversification of tourist services: recreation spaces, boats, vehicles (bicycles, motorcycles), shops and wine cellars; a significantly higher percentage of the respondents, compared with other regions, evaluate the state of their facilities and equipment as excellent or very good. Nearly half of the households are categorised tourist facilities, the quality of which is at the average level.
- The number of farms with mixed income is higher, while the income from agriculture is less important than in other areas; the households engaged in agriculture are mostly specialized – the percentage of the households engaged in unspecialised production is much lower than in other regions (about 20%).
- The percentage of guests' needs which are met by own households' production is very low – providers of tourist service are not engaged in agriculture or, alternatively, agriculture is their secondary activity, which does not provide surpluses that would satisfy tourists' demands.
- There is no problem of hidden unemployment and physical resources of the households are used to a large extent. The strategy of the households is focused on increasing utilisation of available resources, rather than on expanding into other areas of business.

CULTURAL CAPITAL

- When evaluating local resources and wealth, the respondents reported a great number of local events and cultural attractions.
- The products of the utmost significance are agricultural products produced in a traditional manner and organising local events, which are of great importance for about 80% of the households.
- The main products of the region are identified to be wine, honey, fish and agricultural products such as corn, sunflower, etc. The most important traditional products are not determined, due to high dispersion of responses indicating different groups of product.
- A relatively small percentage of the households (less than in other parts of Serbia) use local heritage and enjoy the benefits of local brands.
- Compared to other regions, there is a noticeable difference in that the respondents in this area attach less importance to local products as a factor of preserving the rural tradition, while a larger percent of responses indicate that the respondents believe that their products are similar to others.
- Only a small percentage of the respondents report that the reason why they obtain supplies on the local market is because their customers insist on these products. This suggests that the region does not have typical local products and / or tourist offer is not based on them.

NATURAL CAPITAL

- When evaluating local resources and wealth, the respondents named a great number of natural resources (the sandy desert, rivers, canals, forests), which the respondents consider as their local brands. The respondents claim that the "natural beauties" are the most important capital in their region.
- The emphasis on the quality of food is not as strong as in other regions, but the respondents from this region more often mention water resources and specific plant and animal species.
- In terms of environmental protection, the respondents expressed by far the deepest dissatisfaction with waste management, sewage system and environmental protection, which is the case also in other regions and household samples.
- Regarding the state of utilities and infrastructure, the respondents expressed by far the greatest dissatisfaction with the state of the sewage and sanitation system. According to the opinion of more than a third of the respondents, waste and sewage are the largest problems of the public utility system.

CASE STUDY OF CENTRAL SERBIA

HUMAN CAPITAL

- The average age of the members of the surveyed households engaged in tourism is relatively favourable, indicating that the workforce is vital and there is great working potential.
- A small percentage of the households (less than 20%) have members who have been educated in the field of food safety standards, or who have attended courses of similar content; on the other hand, there is a high participation of the household members in training programs related to improving quality standards in tourism.
- The respondents who are interested in the state support for agriculture and rural development are generally well informed about it.
- According to the respondents' estimates, the knowledge and skills that they lack the most are about the market, marketing and finances.
- Over half of the respondents use the services of consultants / experts; however, this cooperation is not based on a regular programme of cooperation, but the respondents contact them only when they need them.
- The possibilities of diversification of their income are perceived without much respect for the available human potential.

SOCIAL CAPITAL

- The majority of the respondents recognise the *Rural Network* as a crucial actor in promoting local products and tourist potential of their region; the municipality (ranked high, but slightly lower than in Vojvodina) is identified as a key partner in affirmation and promotion of tourist potential, while other actors were not recognised.
- The heads of the households who used to be employed also often report that the previous experience and business connections were useful for starting a new business.
- The connectivity between local stakeholders is extremely low and there are no partnership business relationships based on business agreements and joint initiatives.
- Half of the stakeholders have confidence in the quality of the products obtained from local suppliers (farms), but this relationship/confidence is neither very strong nor crucial in their business relations.

ECONOMIC CAPITAL

- The average household size is at the average level, while the percentage of those who deal with unspecialised agricultural production is high (61% respondents).
- According to 95% of the respondents, accommodation capacities are in excellent condition and a large number of the households use them fully. Very few households own bicycles, motorcycles, boats, fenced and arranged areas for camping, caravans and the like.
- For about half of the households, agriculture is a significant source of income; the placement of their products is almost entirely through tourism, meeting even 50% of the guests' demands for food.
- Tourist services provided by the households are not diversified and are mainly reduced to accommodation, preparation of food and winter stores, etc. Recreational activities and similar activities are not offered to tourists.

CULTURAL CAPITAL

- Cultural heritage as a resource is valued much less than in other regions, and it is often not even recognised as a factor in tourism development.
- The traditional products of the region are identified to be rakija (Serbian brandy), cheese and kajmak (Serbian cream cheese). In addition to these products, raspberry, plum (or fruit in general) and honey are mentioned, but by a significantly smaller percentage of the respondents. On the other hand, the households engaged in tourism in this region more often identify handicrafts and traditional local events as a part of their cultural identity.
- The majority of households (64%) use the local knowledge, resources and heritage, by producing brandy, wine and food prepared in a traditional way. These products are highly valued, but their production is considered to be insufficient, there is no continual supply, and they are also considered to be uneconomical and with no prospects on the market.
- The majority of the stakeholders (58%) believe that the local products are better than similar products from other parts of Serbia, while 14% think that they are the same, and another 14% of the stakeholders believe that they are more expensive than other similar products.

NATURAL CAPITAL

- Natural resources are highly valued: there is a large consensus that the beautiful nature (in a broader sense, including clean air, conditions for producing high quality agricultural products) is the most valuable natural resource of the region.
- Apart from spas, other attractive destinations were not identified.
- The respondents refer to the beautiful scenery, pleasant climate, spas, clean water as the main natural resources, but not stressing that they have special values or specific features compared to other places in the region; the only feature that was identified as a special benefit is that they are more easily accessible for tourists and proximity to large cities.
- Utility infrastructure is underdeveloped (excluding roads); the main problems are inadequate waste management (illegal dumping) and lack of sewage systems.

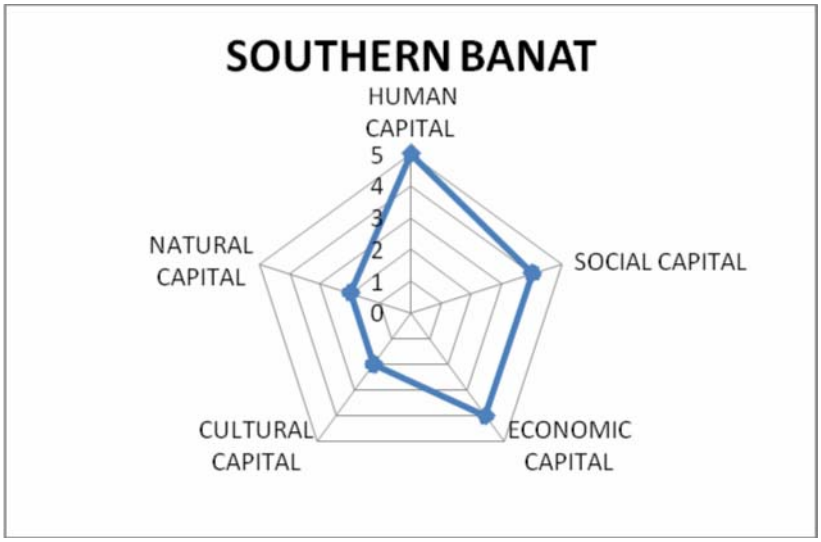

Figure 6: Estimation of the territorial capital of southern Banat
Source: authors' elaboration

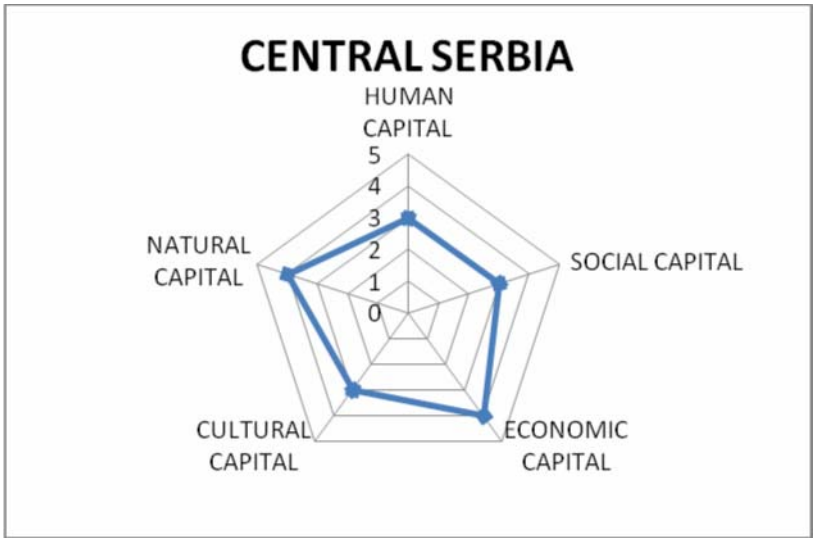

Figure 7: Estimation of the territorial capital of central Serbia
Source: authors' elaboration

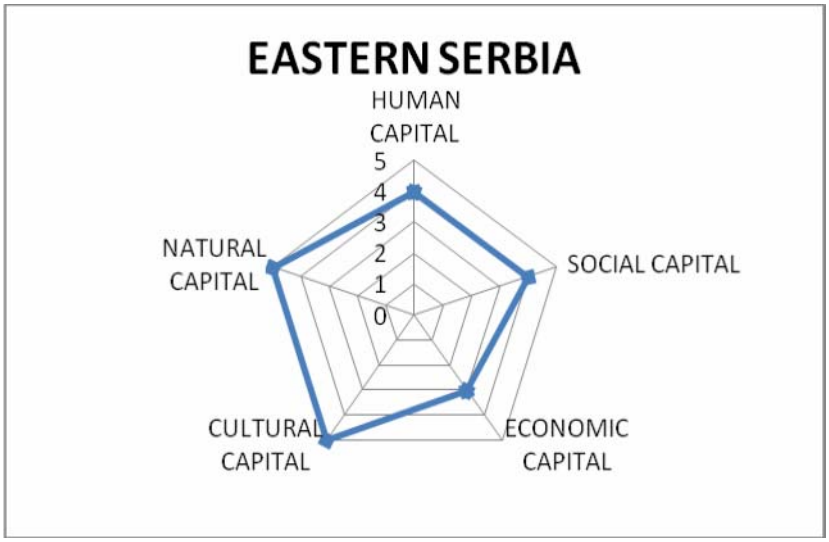

Figure 8: Estimation of the territorial capital of eastern Serbia
Source: authors' elaboration

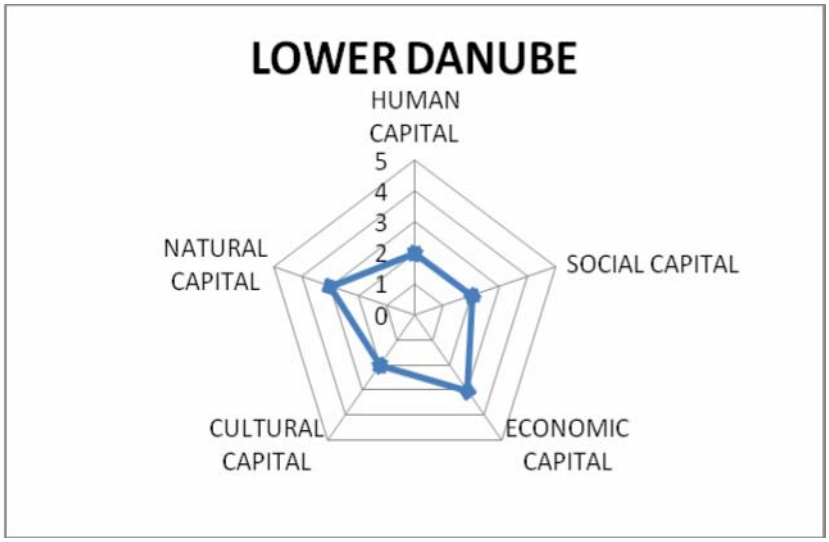

Figure 9: Estimation of the territorial capital of lower Danube
Source: authors' elaboration

CASE STUDY OF EASTERN SERBIA

HUMAN CAPITAL

- The average age of household members is very high (as high as 46 years), resulting in less favourable educational structure of household members compared to other regions.
- The respondents are informed about food safety standards, environmental protection and other aspects of natural resources exploitation more than respondents in other regions. This can be primarily attributed to numerous support programs for improvement of tourist services which have been implemented in the region in recent years, and which typically started with training programs.
- A large number of the respondents are generally informed about the state support for agriculture and rural development, but a high percentage of the respondents say they do not know enough details (53%).
- According to the respondents' estimates, the knowledge and skills that they lack the most are in the fields of marketing and the market, new trends and finances.

SOCIAL CAPITAL

- The majority of the respondents recognise the local self-government as the key actor in promoting tourism potentials. It is notable that NGOs are highly valued, and that the attitude that "nobody does anything" is much less common.
- The relationship with the local community is described by the stakeholders mostly (41%) as very close. Contractual business relationships with small producers for supplies are not common, but the entrepreneurs in this region, more than in other regions, opt for a permanent, regular suppliers and associates. Compared to other regions, the motives of the local entrepreneurs to collaborate with local residents are notably different – a high percentage of the stakeholders (32%) said that the motive for cooperation with local people is their wish to provide income for the locals, which was not the case in other regions.
- Social ties that the household heads gained during previous jobs were of great importance for starting business in tourism.

ECONOMIC CAPITAL

- The households engaged in tourism have small average size of estates;
- 80% of the households have categorised tourist facilities, but with no facilities in the first category; the accommodation is of lower quality compared to other areas, and the special equipment and other facilities / resources are less common;
- Household incomes are highly diversified – more than 50% of the households do not have a stable income, receiving over 50% of their income through temporary employments, rents and other sources: what is specific to the region is a high percentage of households with incomes from pensions (in 22% of the households pensions account for 50% of income).
- All of the food surpluses are placed through tourism and the households do not sell their products on the local market. The lacking amounts of food are provided by other local suppliers, making a closed supply chain within the local market.
- Tourist facilities are more diverse than in other areas, so the households that are not directly involved in the sector also enjoy the benefits from tourism.

CULTURAL CAPITAL

- The respondents identified a large number of local events and cultural and historical sites as their local brands. The respondents in this region attach notably more importance to their cultural and historical monuments.

- The traditional products of the region, as reported by the highest percentage of the respondents, are considered to be lamb, various dairy products (cheese, kashkaval cheese, belmuz – a traditional dish made of *cheese* and *corn flour*), wooden and woollen souvenirs, rakija (Serbian brandy), wine and honey. These responses overlap among the respondents to a great extent, which supports the finding that *there are strong ties between the local population and their local identity. The respondents from this region value the local products more than respondents in any other area. It is certain* that these products require very specific local knowledge and that the respondents are aware of the distinctive characteristics and uniqueness of their brands.
- A high percentage of the households use local heritage and enjoy the benefits of the local brands.
- The majority of the respondents (73%) believe that local products are important for tourism and preservation of rural traditions (68%), but despite the attitude of 55% of the respondents that the production is small, the same percentage of them believe that these products may be profitable.
- The products of this region have great market potential – they are well known to tourists, because these products to a greater extent reflect the original and specific local knowledge.

NATURAL CAPITAL

- The respondents in this region reported a number of natural resources, attaching remarkably more significance to them than it is the case in other regions; according to their opinion, the greatest capital of this region is its natural beauties; the respondents are much more specific in evaluation of their natural resources, mentioning a wide range of natural resources such as: "hydroenergetic potential, a waterfall and rivers", "springs", "mines", "caves", "forests", "breweries / and other facilities of traditional architecture".
- The natural resources of the region are very attractive, providing opportunities for diversification of tourism. These potentials are largely unexploited due to: lack of money, lack of entrepreneurial potential and knowledge due to institutional constraints (unresolved property rights and regulatory frameworks).
- There is a very high consensus on the poor state of the rural environment in the region; the respondents consider this issue as more important than some essential issues, such as the condition of local roads. This attitude also supports the finding that the population of this region attaches great importance to the natural resources and local heritage.
- The physical infrastructure is extremely undeveloped (among others, due to low population density and negative demographic trend). The region is not easily accessible, and the quality of electricity, water supply system and other utility services is low.

CASE STUDY OF LOWER DANUBE

HUMAN CAPITAL

- The average age of household members engaged in tourism is high and the educational structure of household members who can potentially engage in tourism is less favourable compared with other household types and regions.
- Gender balance is noticeably less favourable, which represents a threat to tourism development.
- Compared with other regions, the respondents are *considerably less* informed about food safety standards, environmental protection and other aspects of natural resources exploitation. There is a very low level of participation in educational and training activities related to enhancement of quality standards in tourism. The feeling of the respondents that they need to be educated is weaker than in other regions, and they would not be as willing to pay for such services to professionals;
- The majority of the respondents are generally informed about the state support for agriculture and rural development.

SOCIAL CAPITAL

- By far the largest percentage of the respondents (61%) recognised actually themselves as the key actors in promotion of local values and the region, and this answer was immediately followed the answer that "nobody does anything" (22%)!
- The contribution of the local self-government and other village residents, as their closest partners, is valued much lower, while the NGO sector, tourism organization, the state, etc. are not even mentioned.
- With regard to the importance of cooperation with the local environment, more than half of the stakeholders stated that such cooperation is only ad-hoc and non-binding, having no the regular forms of partnership.

ECONOMIC CAPITAL

- The average size of the utilised agricultural land per household with a farm is 3.4ha, which is among the lowest values compared to other household samples. The majority of the respondents (76%) defined their farms as unspecialised.
- Most of the respondents have categorised facilities, the majority of which belong to lower categories; in principle, apart from their accommodation capacities, the households have little and insufficiently diversified other resources for tourism.
- Tourist offer provided by the households in this region consists of a small number of services, focusing particularly on accommodation of guests;
- What is specific about this region compared with other areas is the percentage of the households with incomes from abroad - more than 15% of the households have more than 50% of income from household members from abroad or they have foreign pensions.
- The percentage of guests' needs met by the own production of the households is low.

CULTURAL CAPITAL

- In comparison with other regions, the respondents insist much less on traditional cuisine and alcoholic beverages.
- Only a small percentage of the respondents use the local knowledge, potential and heritage of the region, since only 39% of them produce traditional food, while a significantly smaller number of the respondents is involved in other activities.
- The respondents in the region value the local products as highly as the respondents from other regions, considering them as important for tourism and rural tradition; however, *it is noticeable that a smaller percentage of the respondents consider the local products significantly better than other similar products;*
- Cultural and historical heritage is recognised as the greatest capital of the region.
- The agreement of the responses about traditional products is relatively small and the households use the local heritage and enjoy the benefits of the local brands only to a small extent; like in other regions, a high percentage of the respondents (over 38%) consider their local products to be of the same quality as other similar products, claiming that their products have no particular value in this regard.

NATURAL CAPITAL

- With regard to evaluating local resources and wealth, a great majority of the respondents agreed that the river Danube and the river resources are the main brands of the region, and this response was given an overwhelming advantage over all the other sites they mentioned.
- Such homogeneous responses, which are at the same time very different from the descriptions provided by respondents from other areas, indicate that the region heavily relies on this resource.
- The utility systems are not sufficiently developed and are neglected. The local residents claim that the problem of inadequate waste management is the major constraint on the development of tourism.

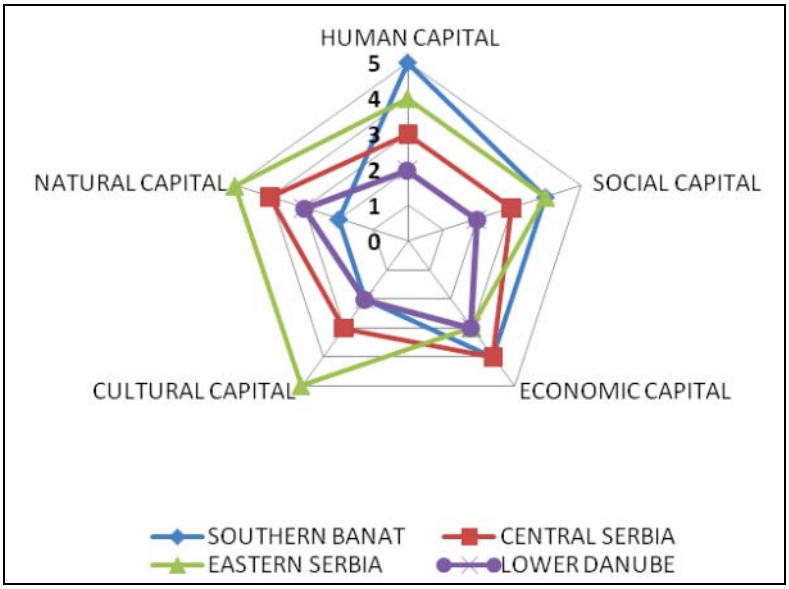

Figure 10: Comparative estimation of the territorial capital of the analysed regions
Source: authors' elaboration

CONCLUSIONS

The aim of this study was to determine whether the development of the existing dimensions of territorial capital in the selected areas is in line with the intended directions of rural tourism development in these areas. The structure of different dimensions of territorial capital in the studied areas showed different levels of development of these dimensions and different connections between them. In other words, on the basis of the selected indicators, it is possible to identify different potentials and obstacles for development of rural tourism in the studied regions. The selected indicators denoting different types of capital were derived from available data obtained from an empirical study, and they show that it is necessary to create different territorial policies of regional rural development (i.e. development of rural tourism in the regions) in order to use the advantages of the existing capital and work on removing the obstacles related to deficiencies in certain types of capital.

The presented analysis indicates that the region of the eastern Serbia abounds in cultural, natural, as well as human and social capital, although the estimation of the economic capital is that it is relatively smaller compared with other regions. This relatively favourable situation of the

territorial capital of the region of eastern Serbia, especially with regard to the natural and cultural capital, is very logical considering the fact that the region is qualified as the *Natural resources oriented economies, mostly mountainous*. High values of the estimated quality of human and social capital in this region can be attributed primarily to numerous projects for tourism enhancement which have been implemented in the region in recent years. On the other hand, the region has been faced with high rates of depopulation, low population density, high rates of population aging, etc., which clearly do not contribute to high quality of workforce and social relations. However, with regard to the prospects of tourism development, there are evident results achieved on improving human capital, entrepreneurial and other relations among the local actors.

The average age, education and skills of the members of the surveyed households/farms in southern Banat, as well as received trainings and their contacts with experts, indicate a high level of human capital compared with other regions. This fact should be taken advantage of in rural tourism, although the estimations of the natural and cultural capital are relatively low. This region is characterised as the region of *Highly productive agriculture and integrated economy*. This means that the performances of the natural capital are more oriented towards exploitation of this high-quality land for agricultural purposes. Other elements of natural capital, even at the level of micro-location which evidently has the potential for tourism development, are less significant. The obtained results thus suggest that tourist offer of this region can be based on specific types of services which, rather than "relying" on natural beauties and cultural heritage, are based on attractive facilities, for example, recreation. Developed economic capital, infrastructural facilities, easy accessibility and proximity to large shopping centres seem to be the key advantages of this region.

Apart from the values of the natural and economic capital (which are comparatively among the lowest), the region of the lower Danube does not have remarkable values for other types of capital. This indicates the need to employ different policies to possibly stimulate the development of the lacking resources, provided that the creators of rural development policies consider rural tourism as a significant aspect of regional development, primarily because of the natural potentials of the region.

High values of the economic capital in the region of central Serbia arise from significant accommodation capacities and other conditions

favourable for development of rural tourism, as well as placement of a significant share of products through tourism. Natural capital is also highly valued, but there are lower values of cultural, social and human capital due to relatively lowly valued cultural heritage, weaker ties between the local stakeholders and poorer education and evaluation of the available human potential. The conception of tourism as a development option for this region is (too) traditional, relying on the natural beauties – landscapes, spas and cultural monuments. On the other hand, it is this long tradition in providing rural tourism services that has led to the situation that the local actors are not united, that there is no sufficient networking among them and no innovation in their offer. Therefore, this region might lose the pace with the regions which are just starting such innovations and which systematically enhance their territorial capital in that direction. The region belongs to the area described as *Small urban economies with labour intensive agriculture*, which implies that it is threatened to lose its identity by reallocation of resources to other sectors of urban economy.

These advantages and disadvantages should be analysed and used by creators of local/regional development policies in order to strengthen the natural, social and economic competitiveness of the region. They should enable better usage of the specific natural and cultural resources of the regions, the actors' abilities to successfully cooperate, and create and maintain added values within the very region. In addition, apart from the aforementioned dimensions of territorial competitiveness, positioning in the global context is of special importance for rural tourism development in general, thus in the studied region, as well. The question is just to which extent the local decision-makers and creators of development policies and strategies are going to rely on the sector of rural tourism and invest in it with the purpose of improving the living standards of rural population and economic performances of the regions. What is very important to be concluded from these analyses is what are the aspects of development and what kind of adjustments and investments in resources need to be made in which region if the goal is sustainable development of rural tourism. The most significant thing here is which sector, i.e. activity has the highest rate of return on investments and what are the manifest, as well as lateral effects of investments in development of certain potentials. This is important to note because rural tourism is often unjustifiably considered as a "magic wand" for solving problems of rural areas, with no prior analysis of territorial capital and adequacy of territorial capital for development of rural tourism.

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POLICY OF SUPPORT TO AGRICULTURE AND RURAL DEVELOPMENT

INTRODUCTION

If we accept the usual systematization of agrarian policy measures on:

- measures of price policy regarding (prices in narrow sense, reserves, crediting of production and stocks, regulation of exchange with foreign countries);
- measures of development policy (policy of investment – including the basic agricultural infrastructure, development and application of research, stimulating the use of fundamental inputs),
- measures of adapting the agrarian structure (property relationships – including inheritance and property size, re-grouping of holdings, land redistribution, norms for some forms of production),
- measures of social and fiscal policy (taxes and contribution, health and pension insurance, public welfare, make easier transfer of the agricultural population, etc.),

it means that this part of the work will deals with the basic questions of the agricultural policy in Serbia in the recent past and the present, without prejudicing the physiognomy of the agricultural policy in the future. In addition, the physiognomy of the future agricultural policy is more or less known and, doubtlessly, that it will be structures based on satisfying all requirements to join the World Trade Organization and adapting to the Common Agricultural Policy of EU. It simultaneously means that this part of the work will not deal with the problems of criteria based of which some measures and instruments of the agricultural policy were determined. It is enough to note that criteria have often been mutually conflicting, primarily when relating to price policy in the narrow sense, supply policy, policy of agricultural subvention and crediting production and supply of agricultural products and foodstuffs. Especially inexplicable are the turns in the policy of developing extension services.

The primary goal is to approximate efficiency and consequences of measures and instruments, at the level that satisfy the volume and quality of statistical material, without getting into the evaluation of completeness

and inter-conditionality of the governmental set of measures in some segments of the policy. In addition, the history is not of great importance; therefore, the work will be primarily concentrated on the first decade of the 21th century, i.e. the changed political and macroeconomic conditions. The task is not very simple for two reasons. First, authors are not informed about works in the domestic literature, which, except the descriptive approach, quantitatively and analytically deal with the efficiency of measures and instruments of the Serbian agrarian policy in the recent past, in spite of the developed econometrical and statistical instruments. Therefore, authors had to rely on different statistical materials being mutually incomparable for information quality. Some notes will be always given in the text about this so the results of calculation should be taken as an orientation giving to this due reserve judgment. In fact, available evidences have determined the structure of the work.

The evaluation of dynamic coordination of supply and demand of agricultural and food products and the economic position of agriculture in income creation and distribution are the starting point and the framework of conditions where some measures of the agrarian policy are composed, on the one side, and the ambient for the evaluation of efficiency, on the other side.

Efficiency evaluations of the agrarian policy always amount to the attempt of synthesis of the bulk of analytical data. It is understandable; this work cannot pretend to give sufficient analytical support. Analytical support is created in the period of systematic researches lasting many years. Trying to synthesize, this shortage can be only partly moderated by using the experiences of countries with similar resource structure. Therefore, synthesis must be done more relying on foreign experiences than on reliable support. Awareness of these facts has exerted influence on the conception of this work.

1. AGGREGATE SUPPLY AND DEMAND FOR AGRICULTURAL PRODUCTS AND FOODSTUFFS

Based on statistical evidence, the coordination of agricultural supply and demand of agricultural and food products can be evaluated only approximately. In spite of the lack of evidence in statistical materials, by comparison of the growth rate of expenses of the population for food and

agricultural production, it is more than obvious that aggregate supply has exceeded demand to a certain extent in the last 12 years.[88] There are numerous indications that the supply of agricultural and food products exceeded demand in average in the period from 2000 to 2011. The first indication comes from interdependence of food expenses in relation to the total expenses of the population for personal spending and relative prices of agricultural and food products in retail trade. Having in mind the reliability of statistical evidences, interdependence is high, evaluated parameters are statistically significant, and autocorrelation of the residuals is considerably over the allowed limit (Fig. 1 and 2).

It results from the cited interdependence that relative prices of agricultural and food products showed slow drop in prices, meaning that aggregate supply exceeded aggregate demand. Food expenses increase yearly per the rate of 0.72 % in average.[89] Such a slow imbalance of supply and demand with relative low income elasticity of demand relating to the level of economic development (0.3% in average)[90] and the low price elasticity of demand (-0.23%)[91] unavoidably meant that some surplus of supply had a disproportional price effect. It finally meant parity aggravation of the economic position of agriculture. Really, relative prices of agricultural and food products in the market of personal consumption decreased per annum average rate of -0.65%.

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[88] Determination to analyze the period from 2000 to 2011 was based on changed political and macroeconomic circumstances in relation to the previous decade. First, the conclusion relates to the "opening" of the economy since 2000 relating to the completely closed economy until then. Changes of circumstances unavoidably meant the necessity of adaptation of agriculture, about which we will talk later.

[89] All growth rates in this part of the text are calculated from the linear trend. High year variations of analyzed aggregates do not allow the calculation from original data.

[90] It is important to note again that imperfectness of statistical files. From the series of data of the total expenses for personal spending and food expenses, the size of income elasticity of demand for agricultural and food products is calculated. However, part of food expenses in the total expense for personal consumption, according to the questionnaires of the population amounts to 41%. Having in mind the level of economic development, it is certainly a more real value. Based on registered values, share for food in the total expenses for personal consumption has stagnated since 2008, while the same on the questionnaire based value has increased.

[91] The estimate of basic elasticity for food demand is done from interdependency of food expenses (constant prices in 2002) and the prices of retail agricultural and food products settled by general price index taking deflation into consideration: $\ln Y = 13.50745 - 0.22826 \ln X$; $R = -0{,}519$ (Y – food expenses, X – relative prices of agricultural and food products).

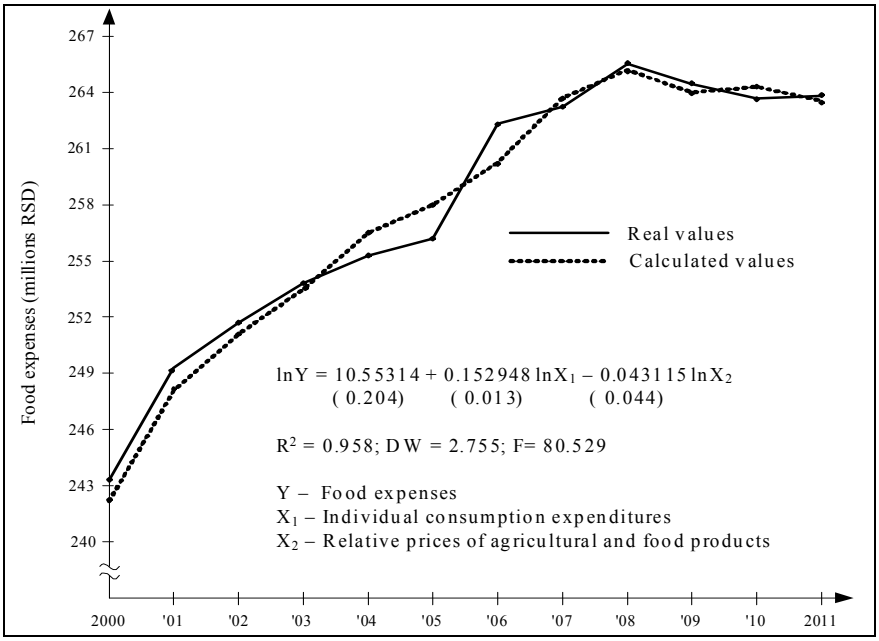

Figure 1: Actual and calculated values of food expenses (constant prices, 2002)
Source: Own calculations on the basis [6].

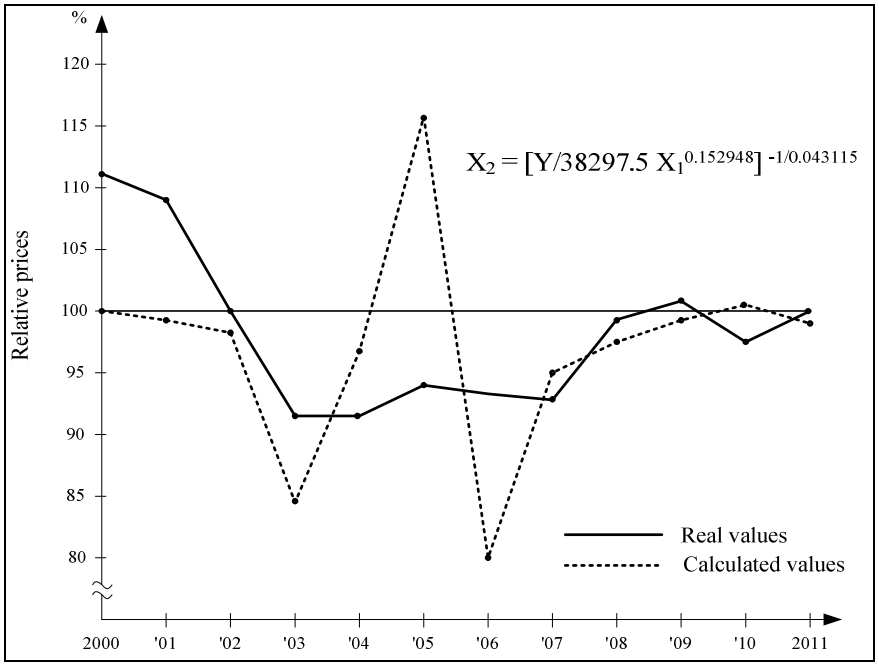

Figure 2: Actual and calculated relative prices of agricultural and food products in retail trade (Consumption price index = 100)
Source: Own calculations on the basis [6].

Second, a more reliable indication for the same conclusion comes from the estimate of combined growth rate of agriculture and food industry (food production).[92] To make reliable the combined supply growth rate of agriculture and food production in the market of personal consumption fairly well, it would be correct to rely on input-output relationships between agriculture and industry of food production. However, data unavailability on weighted agriculture and food industry leaves only one possibility of estimating the approximating combined supply rate based on share of these sectors in the social product. It can be expected that share of agriculture in the total supply of agricultural and food products will decrease on "behalf" of food production, being the logic of development process on what almost the double growth of physical volume of food production refers in relation to the growth of the physical volume of agricultural production (1.81:0.93%). However, share of agriculture in the Gross Domestic Product stagnates, while share of food industry was reduced in the cited period. This moment we should have in mind when approximating the total food supply.[93]

The estimate of combined supply gives the average rate for the cited period of about 1.15%.[94] Demand growth for agricultural and food products amounted to 0.72%; it is an additional indication to draw conclusion about imbalance of aggregate supply and demand of agricultural and food products in the period from 2000 to 2011 (Figure 3).

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[92] The estimate excludes drink and tobacco industries, although it would be methodologically more correct to include these industries into the estimate. However, the change of data registration system in the statistical service has caused the only possible estimate.

[93] The second essential methodical problem, which in the estimate of combined rate of agriculture and food policy could not be surmounted relates to the indices of the physical production volume. The indices of agricultural production growth are shown based on net final production, while the indices of physical volume of food industry are reported the "gross" basis. It means that in case of food production, the total production is reduced neither for internal reproduction nor for reproduction input from agriculture. Therefore, the combined change rate of food supply should be taken with due dose of reserve, especially during establishing connection with final consumption.

[94] From the estimate of the combined growth rate of food supply appears that the contribution of agriculture to the growth of supply is 69.8%, and the food industry of 30.2%. (The estimate was done based on the formulae: $r_p x + r_{pi}(1-x) = r_k$; r_p – growth rate of agricultural production; r_{pi} – the growth rate of food production; r_k – the combined growth rate of supply of agricultural and food products).

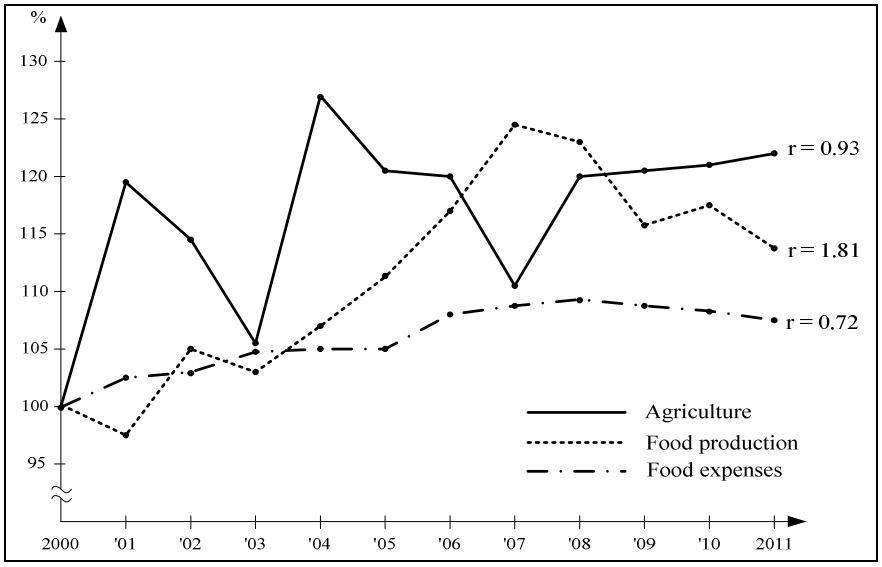

Figure 3: Growth indices: Agricultural production, food production and food expenses

Source: Own calculations on the basis [6].

Of course, the relationships of average values are only the starting point in the dynamic analysis of relations of agrarian supply and demand of agricultural and food products. The fact that characterizes the time we talk about and what specially worry us are the slowdown of agricultural production growth and the absolute fall of food production since 2007. The slowdown is obvious from the trend of production volume and more obvious from six-year movable trends (Figure 4). In addition, illogicality of contrary directions in the growth of agriculture and food industry has been visible after 2004, where the instability of agricultural production surpasses the instability of food production, with relatively stable growth of food expenses, and it is an additional indication of above average of price effects. According to the logic of interdependence, the relationship of year indices of agriculture growth and food industry could be approximate to the growth of food expenses. Really, interdependence is, overall, high[95] with expressive deviations to the lower one in 2001 and

[95] The estimate in the text derives from the relationship of production volume index: agriculture and food production, food on the one side, and the growth index of food expenses, on the other side. Interdependence is expressively emphasized: Y= 27.339 + 0.613X; R = 0.915; Y – relationship of the index of production volume of food production and agriculture; X – index of food expenses in constant prices), therefore, the estimate is enough reliable.

2004, and the upper in 2007. It means that in these years, there were underestimating, i.e. overestimating the growth of agriculture or food production, or both. Judging by these facts, it is about overestimation, i.e. underestimation of food industry growth because of "wavy" introduction and unsystematic registration of "new" products in the index account.

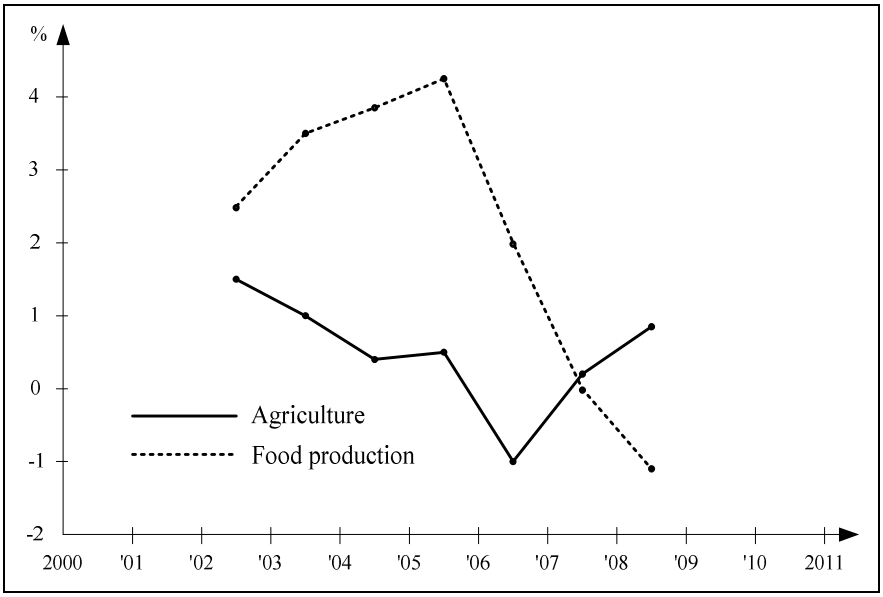

Figure 4: Calculated growth indices from six-year movable trends
Source: Own calculations on the basis [6].

The estimate shows an unexpected high growth of food production in average in relation to the growth of agriculture of almost 2:1.[96] Such a result can be explained by two moments. First, in this period, the growth of agricultural products processing was essentially conditioned by repression of processing and finishing in households and handicrafts. It means that the index of food production growth was appreciably over the real supply growth of this industry in the market of personal consumption. Regarding to the fact that the growth of food production could not be possibly reduced for the growth that was caused by

[96] The relationship of interdependence is $\ln Y = 2.754 + 0.411 \ln X$; $R = 0.350$ (Y – index of food production growth; X – index of agricultural production growth). The low level of interdependence additionally confirms the illogicality of statistical registering of production volume.

repression of processing in households and handicrafts, it was not possible to estimate net supply of this branch. Second, growth indices of food industry, contrary to agriculture, were not registered on net basis, but they include reproduction consumption of the branch, which, as a rule, appreciably grows faster than net final supply. These both moments are not essential for the text that follows, but only as an indication on the approximate estimate of aggregate supply and demand of agricultural and food products. This relationship predominantly determines the parity of economic position of agriculture, on the one side, and exerts influence on the physiognomy and structure of measures and instruments of agricultural policy.

2. THE ECONOMIC POSITION OF AGRICULTURE

In the work of this character, it does not make sense to emphasize what measure the parity of economic position of some economic sectors and branches exerts influence on not only the tempo of growth but it has direct regional and social reflections, whose "specific weight" unavoidably rises together with the level of development. With this, the parity of economic position is the basic point both current and development policy.

"Agriculture is a unique example of economic sector which legally develops in the conditions of the decline of human and material resources. Relative decline of resources implies, of course, the disparity of economic position of agriculture. Looking at that in a development-historical way, the disparity of economic position of agriculture is both the "trigger" and the generator of economic development, but the generating influence falls during development" [3].

The disparity of economic position of agriculture is an empirical fact, at least. This is the same with the tendency of narrowing initial disparity in the position of agriculture in the development period. However, although the functional connection between the level of development and disparity of the position of agriculture is not disputable, this relationship is not direct. The significant deviations appear under the influence of the whole range of influences, among which the prevailing are: proportion of initial disparity, composition of resource – in agriculture and in general, speed of economic growth, etc.

Development in the conditions of relative fall of resources supposes the degree of adaptation far above average. The process of adaptation is extremely complex; it substantially limits the preciseness of measuring proportions and tendency of economic disparity. However, the comparative analysis of disparity of economic position can be used as a reliable indicator of physiognomy and implication of agricultural policy.

Parity of the position has two basic forms. First, parity in creation and the other, more important, parity in distribution of Gross Domestic Product or Gross National Product. However, these are the "final" relationships because the influence of relationships in reproduction consumption on the income level is omitted.[97] Namely, it is not difficult to suppose how much the statistical service is unable to register an endless abundance of processes characterizing adaptation or transformation of agriculture. Problems are huge and they begin with the definition of the "agricultural population" category, even more with registering the degree of activities of the agricultural population.[98] However, main difficulties are in registering the income of agriculture from "non agricultural activities". Further difficulties appear in registering the position of agriculture in redistribution. Some essential features cannot be quantified, while the other, as a rule, cannot be registered with satisfying preciseness (for instance, net subventions in agriculture according to different bases). At last, the exceptional dual character of our agriculture makes the analysis difficult. In coexistence of the two sectors within agriculture differing not only in the degree of development but, more important, in economic behaviour, comprehension of agriculture overall, has a very limited relevance. This is the reason for the relationships in this part of the analysis will be done roughly for the sector of agriculture overall.

Taking into consideration that the quality of records requires a necessary gradual procedure in measuring parity or relative economic position of agriculture, first there will be carried out the parity of the gross value added of agriculture. The parity of economic position is based on gross value added per active inhabitant in non-agricultural sector of agriculture in relation to the net value added per active inhabitant in the sector of

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[97] To "lessen" somewhat the problems cited in the text, authors determined to the estimates of the parity of economic position and labour productivity based on the Gross Value Added. Finally, systematic problems in registering do not influence essentially on tendencies that is important in such analyses.

[98] To illustrate, it is enough to refer to the definitions and comprehensiveness of agricultural population in our censuses.

agriculture – all at the current price. For the reasons already mentioned, the analysis is "located" in the period from 2000 to 2011, and the base relationship, for the same reasons, is "bound" for 2002.

The results of the estimates in Table 1 and also illustrated in Figure 5 definitely confirm the statements done based on the analysis of relationships of aggregate supply and demands of agricultural and food products. The imbalance of supply and demand had unavoidably the price effects reflected in tendentious aggravation of economic position of agriculture at the annual rate of -2.35% in average; therefore, the position of agriculture, in time average, was under the average level of non-agricultural sector. The exception is the starting years of the analysis; it is the period when the economy of Serbia "functioned" according to the model of closed economy. The graphic representation convincingly demonstrates the gradual aggravation of the position of agriculture with the degree of "opening" the economy. It proves that "closing" the economy unusually influences non-agriculture; primarily the industrial sector of the economy, i.e. agriculture is a more vital sector in irregular conditions of business.

Year	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Economic position parity	97.87	102.56	77.68	70.95	77.86	70.10	68.06	65.24	70.80	66.42	74.59	84.14
Labour productivity parity	70.60	78.97	77.68	67.42	87.10	81.66	80.28	72.77	79.10	86.80	88.73	95.98
Parity of prices	138.63	129.87	100.00	105.25	89.39	85.84	84.77	89.66	89.51	76.52	84.07	87.66

Table 1: Parity of economic position, labour productivity, and prices in creation Gross Value Added
Source: Own calculations on the basis [6].

Year	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Economic position parity	97.06	101.98	77.34	70.61	77.54	69.83	68.13	65.30	70.76	66.43	74.53	84.15
Labour productivity parity	70.02	78.53	77.34	67.09	86.75	81.35	80.37	72.83	79.06	86.81	88.65	96.00
Parity of prices	138.63	129.87	100.00	105.25	89.39	85.84	84.77	89.66	89.51	76.52	84.07	87.66

Table 2: Parity of economic position, labour productivity, and prices in distribution Gross Value Added
Source: Own calculations on the basis [6].

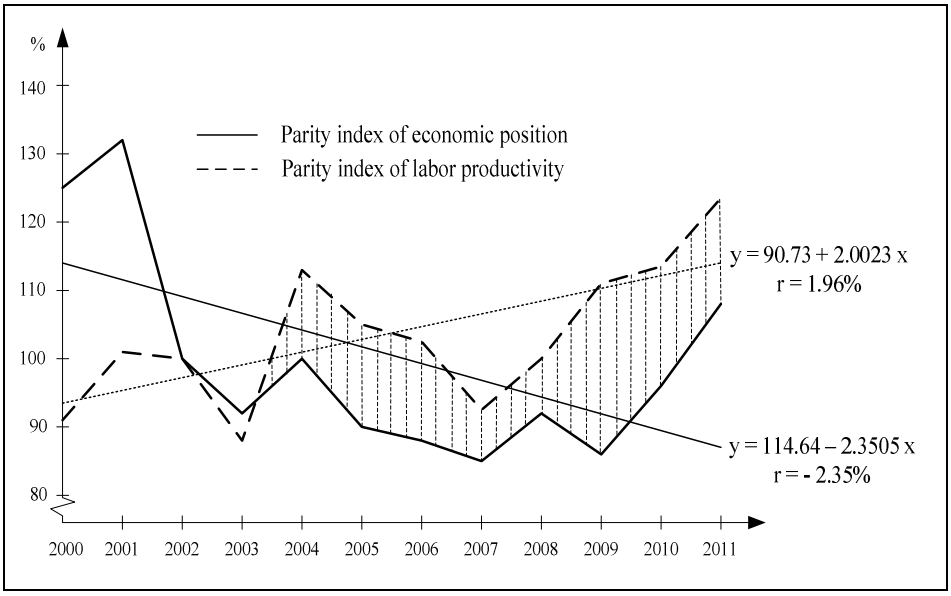

Figure 5: Economic position and labour productivity parity in creation of gross value added
Source: Own calculations on the basis [6].

Here, it is very important to 'isolate" two basic influences on the parity of economic position. First, it is the influence of the parity of labour productivity, and second, it is about the influence of price parity. The parity of labour productivity derives from the same relationship as the economic position parity, but it is based on constant prices. The influence of prices derives, of course, from the relationships of economic position parity and the parity of labour productivity.

In the observed period, labour productivity in agriculture increased faster than in non-agricultural part of economic activities. The growth of labour productivity of agriculture was convincingly surpassed the same value in non-agricultural part of the economy – the growth rate of relative productivity of agriculture amounts to 1.96%. Therefore, it results that the influence of relative relationship of prices significantly reduces the influence of growth of relative labour productivity on the parity of the economic position of agriculture.[99]

[99] Shaded parts in Figure 4 illustrate the changes of price influences from year to year, as well as the basic tendency.

Such an expressively negative influence on the economic position of agriculture is not logic; neither can it be considered regular relationship with production activities in the given frameworks of economic development. According to the logic of development processes, we should expect that the growth productivity rate in non-agricultural part of the economy increases faster than in agriculture and it would cause the converse influence of price relationships. The shown relationships are characteristic in a significant upper phase of development, when for reduction of share of the agricultural population, the rate of transfer of the population in agriculture rapidly grows.[100]

Parity of the position in distribution is far more important in the agriculture sector (Table 2, Figure 6).[101]

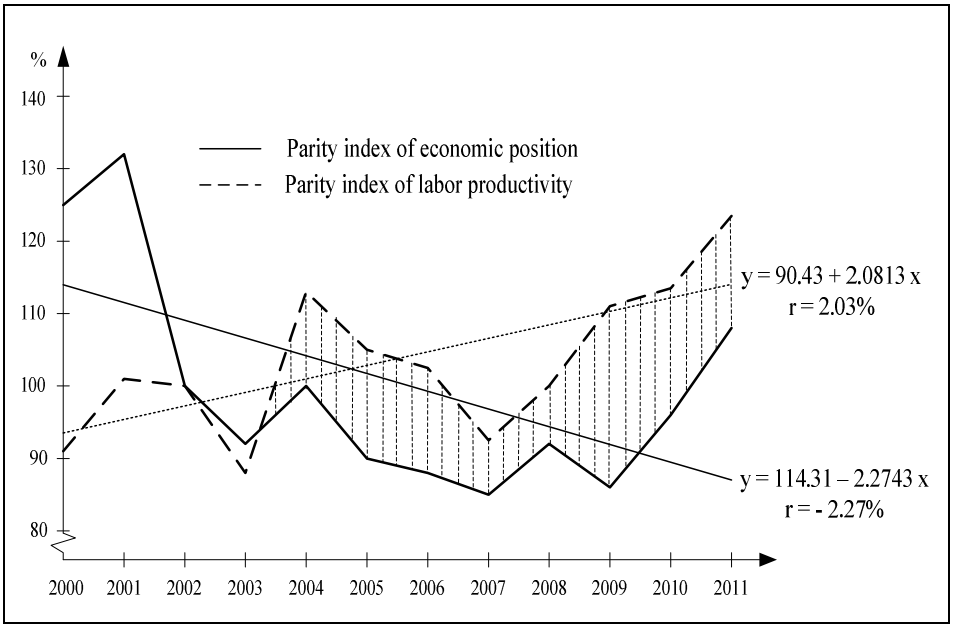

Figure 6: Economic position and labour productivity parity in distribution of gross value added

Source: Own calculations on the basis [6].

[100] Experience says that a sudden disparity of agriculture comes after reduction of the share of agriculture population under approximately 12% mostly primarily due to the high population transfer rate.

[101] It would be interesting to analyze the position of agriculture in the secondary and tertiary distribution, as well as the analysis of internal parity determining the structure of agricultural production, but these themes are not within this work.

The economic position parity of agriculture is estimated by the identical methodology as the parity in creation, so the estimate is based on the overall agricultural, i.e. non-agricultural populations. According to the logic of mutual relationships, the position of agriculture in distribution ”follows” the position in creation, therefore, there is still the statement that the disparity of agriculture overall noticeably under the proportion that would correspond to the level of general development. Finally, the influence of relative labour productivity and relative prices remains more or less unchanged in relation to that illustrated in the analysis of the position parity in creating the gross value added.

3. EVALUATION OF THE AGRARIAN POLICY IN SERBIA

The previous analysis has convincingly shown that the agriculture in Serbia, after „opening“ the economy, has developed in the conditions of three mutually conditioned tendencies: 1) growth of relative labour productivity; 2) decrease of relative prices of agricultural and food products; and 3) decrease of income elasticity of demand for agricultural and food products. As for the importance of agricultural development, it is interesting to emphasize the reflection of decreasing income elasticity of demand on the volume of commercial disposal of agricultural and food products. Namely, the lower demand elasticity means that the volume of potential disposal of goods represents the basic limiting factor of growth of agricultural production, where the reflection is the final low rate of the physical production growth.[102]

The composition of influences of relative productivity, relative prices and income demand elasticity has caused the decrease of agricultural income per capita in relation to the same size in the non-agricultural sector. With much emphasized income and social dispersion within the agricultural sector and the extreme unfavourable property structure, the combinations of all the cited factors, unavoidably “compel” the wide spectre of

[102] An additional factor of limiting the disposal of agricultural products represents also the reduction of the total population number. Between the last two censuses, the average annual rate of population decrease amounted to 0.47%. The population decrease and the low-income elasticity of demand are the basic factors which determined the supply of agricultural and food products.

interventional- regulative measures. We should take into consideration that Serbia, on the average, used to be the net exporter of agricultural and food products. Namely, the position of the net exporter country requires an essential different structure of intervention measures relating to the position of the net importer, simply because price policy hardly offers the possibility of efficient intervention. Therefore, the net exporter country is forced to support relatively high budget subventions, which is always and everywhere the measure of arbitrary income drain.

Therefore, that may turn out to be useful, before a detailed quantitative analysis, to give a short review of consistency of changes in the interventional-regulative mechanism during relatively short period. This review is necessary to present the "turns" and inconsistency in the agricultural policy of Serbia (Table 3, Figure 7).

2000-2003	2004-2006	2007-2008	2009-2011
• Price support for basic agricultural products; • Material interventions on the market; • Subventions for buying agricultural land.	• Reduction of price support; • Input subventions; • Credit subventions • Introduction of the registry of agricultural producers; • Support to adapting to international standards.	• Elimination of support to rural development; • Elimination of measures of credit support; • Support reduction to structural adaptation; • Subventions to agriculture according to the principle of „area and herd payment".	• Support restrictions by paying pension insurance; • Break with subventions to non-commercial farms; • Intensifying conditions for „area payment"; • Support reduction to structural adaptation; • Reduction of investment support; • Attempt to leave „area payment", and repeated introduction of price support.

Table 3: Periodization in the composition of measures of the agricultural policy in Serbia

The general characteristic of the overall of the time period after 2000 relates to the process of political decision-making that has brought unstable agricultural policies and created uncertainty for agricultural

producers and other participants in the production chain and food distribution. The process of policy formulation is not based the on ex-ante estimation of effects of new measures and instruments, or even rigid estimation of the former policy. Too big discretion right of the Ministry, with marginal role of the Parliament, distribution and purpose of budget resources, together with political instability, have created the framework where the producers' interests is tried to be presented, and not interest of the state on the whole. In such a situation, changes in price policy and agricultural subventions have usually had the lack of stable effects on business conditions. An extreme uncertainty has been manifested in unfavourable conditions to invest in agriculture, although the measures of agricultural policy have solved some of the short-term problems.

The declarative attempt to increase supply and the production efficiency of agricultural products has not been materialized in measures of the agricultural policy, well illustrated by the "turn" and inconsistency of the structure of agricultural policy measures (Table 3).[103] It is indisputable that liberalization of market agricultural and food products has been literally changed, with extremely negative effects on the size of supply. Namely, in the conditions of supply surplus without the system of guaranteed or minimum prices, which would guarantee the "parity" income to producers, is not possible to exert significant influence on production size. In addition, today, the usual practice to regulate supply in the most developed countries is carrying out the policy of guaranteed prices, disregarding if they want to limit or increase supply. In essence, the guarantee mechanism for is carried out by means of two methods: 1) method of paying price differences, and 2) method of determining market price by the level of guaranty or protection.[104] Without the guaranty system, the efficient work of the mechanism of material intervention on market is not possible (creation and release of reserves on

[103] Classification structure of the budget support to agriculture somewhat differs from the classification carried out by the group of authors [2]. No doubt, this work is a pioneer attempt to systematize the budget support to agriculture based on correct methodology, and according to the methodology accepted in the Organization for Economic Co-operation and Development (OECD).

[104] Today EU issues intervention prices for the majority of agricultural and food products, as the measure of super protection of producers. Intervention measures react in case if the basic protection system, usually very efficient, is endangered even for short.

the market) and, in essence, it was the subject of arbitrary estimation of market conditions, and therefore, not enough efficient. It is necessary to say that the system of guarantee is, although requires a lot of paper work during its carrying out, very efficient in the conditions of non-elastic supply and extremely low income elasticity of demand because it primarily prevents serious disturbances on market. Serbia has determined, of course, according to the model of EU, to subsidize agriculture by paying per hectare for registered agricultural holdings up 100 ha and head of livestock (direct paying). In principle, this mechanism is not in doubt, but the desired efficiency is attained in the combination with price guarantee. Namely, if subsidizing is carried out without any combination with price policy (paying differences in price), distributive effects, which normally depends on the relationship of price elasticity of supply and demand, are less favourable for agricultural producers.

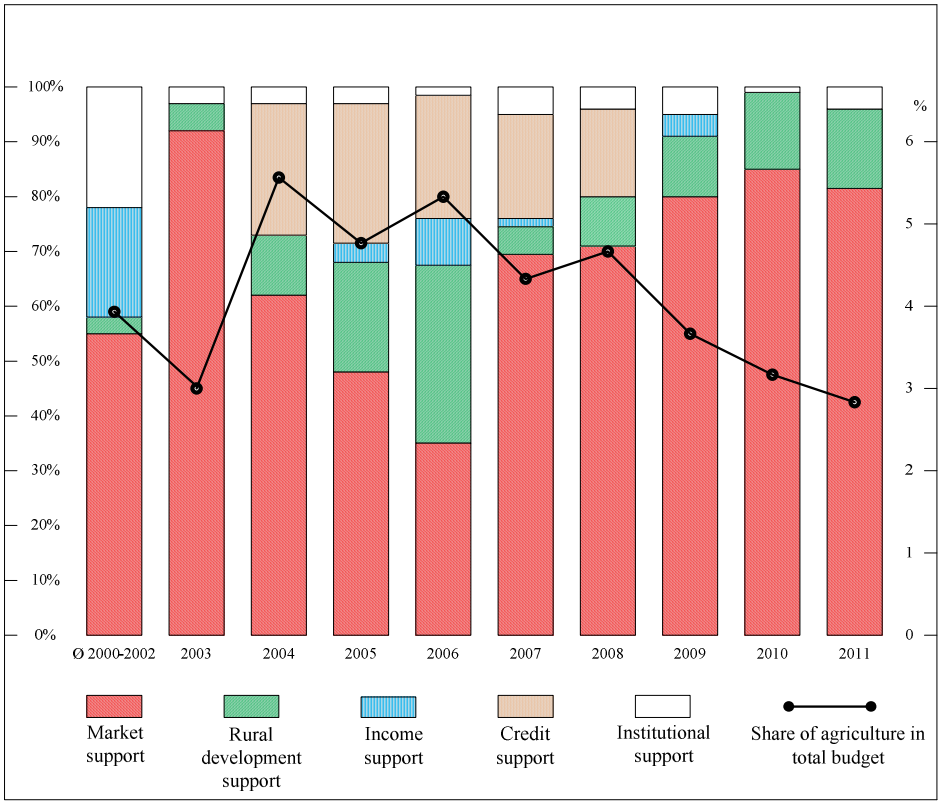

Figure 7: The structure of budgetary support for agriculture in Serbia
Source: Own calculations on the basis [13].

To estimate instrument efficiency of direct paying per hectare and head of livestock, it is necessary to estimate price elasticity of agriculture supply.[105] Logically, because of the former cited deficiencies, the estimate of price elasticity of agricultural supply had to be based on the minimum of data. The estimate results in a very low short-term price elasticity of supply: 0.0999. No doubt, the estimated coefficients of elasticity of supply and demand definitely point to the earlier statement on the encounter of low elasticity of supply and demand and the need to "set up" combine the system of price guarantee into the mechanism of direct payment. Even more, in the conditions of surplus of supply the combination of direct paying and price guarantee, or much better target price, the paying as differences in price, fewer amounts of resources for subventions would be required in our conditions.

It has been already noted that the distribution effect primarily depends on the estimated values of elasticity of supply and demand. Taking into consideration that elasticity has a correct indication, it means that subventions reduce product price "on the threshold" of agriculture. Price reduction of agricultural products automatically means that the whole

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[105] The estimate price elasticity of supply has already been done. See footnote 4. The method of the estimate applied in this work is adopted by Food and Agricultural Organization (FAO). The estimate is based on the functional relationship:

$Y_t = \alpha_1\beta \cdot P_{t-1}^{\alpha_2\beta} \cdot Y_{t-1}^{(1-\beta)} \cdot T^{\alpha_3\beta} \cdot U_t$

Where the symbols represent:

Y_t - index of physical volume of agricultural production;

P_t - price index of producers of agricultural products deflationary arranged by price index of producers of industrial products;

T - time;

U - residual value.

The estimated coefficients: $\alpha_2\beta$, $(1-\beta)$ and $\alpha_3\beta$ represents elasticities in the short run. If we want estimate elasticity in the long-run, then the short-run elasticity are divided with β. The results of the estimate:

$Y_t = 6.042674 \cdot P_{t-1}^{0.099904} \cdot Y_{t-1}^{-0.441812} \cdot T^{0.097827}$;

$R^2 = 0.557$; $DW = 1.9345$.

(0.052840) (0.288262) (0.272251) (0.072601) ; - standard errors of the estimation.

Although the estimated parameter of price elasticity of supply has a logic indication, it is not statistically significant, but still it can be used as an orientation estimate of distributive effects of direct paying.

amount of subventions does not belong to agricultural producers, but processors and/or end users usurp part of it. Really, it appears from the estimate[106] that 30.4% of the amount of subvention is "usurped" by consumers and/or processors of agricultural products, while 69.6 % of subvention amount belongs to agricultural producers.

With the measures for agricultural subventions, it is instructive to analyze the case of milk subsidy. Bonus payment for milk production is a positive, but, in our conditions, simply extorted measure. It is positive because it represents the break with the extensive production increase, with the attempt to surpass lasting the causes of supply deficit. It is forced because, in the conditions of obviously lower supply than demand, milk production subsidy is done with a view of creating additional supply. However, the real causes of supply deficit were not eliminated even with massive production subsidy. The subsidy volume ranged from 15% to 33% of the average purchase price of milk and it was enough to realize supply and demand balance. Even, real milk purchase price[107] increased per rate of 3.48%. Productivity of raw milk also increased per rate of 2.74%, but the physical production volume decreased per rate of 0.79%, annually. In spite of productivity rise, the volume of production was reduced primarily due to the fall of the number of milk cows (drop rate was 3.48% per year on the average). Logically, supply increase could be expected because of the growth of price and productivity, but it did not happen. Production subsidy to 2005, with the rise of milk price (14.4%, per year) in purchase caused the growth of production per annual rate of 0.46%, and, no doubt, the effect of subvention on production volume was positive. Since 2005, the physical volume of production has started to decline continually, due to the drop of relative milk price. In this period, prices decreased 3.8% per annum and production volume per rate of 2.0% so even the growth of productivity of 1.61% could not compensate the fall of the number of milk cows of 3.60%, per year. According to the trends, with low price elasticity of supply (about 0.2)

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[106] The estimate is derived based on the pattern $\frac{dP}{dS} = \frac{-1}{1-\eta/\varepsilon}$, that P denote price, S subventions, η price elasticity of demand and ε price elasticity of supply. For mathematical proof see [4].

[107] Milk purchase price that is deflated by the average purchase price of corn, as the most important component of fodder. It would be better to deflate milk price by the index of fodder price. However, our statistics does not record fodder price, not the physical production volume in fodder industry.

and more elasticity of demand, supply deficit could cause bigger disturbances than real ones on the market of milk and dairy products if there were not "buffer" factors as demand fall[108] (number of inhabitants), import and periodical material intervention.

It is not disputable that the "break" of tendencies in dairy production happened with the end of privatization of manufacturing capacities. Inefficient anti monopoly legislation enabled the high concentration of dairy industry[109] and the monopoly position to one manufacturer. Of course, in the conditions of monopoly, the effect of milk subsidy on production volume was marginalized. In addition, we should add liberalization of the foreign trade and foreign exchange system that enabled open possibilities to milk import and dairy products at dumping prices, and this import did not have an intervention character.

The sector of milk is certainly the best example of contradiction of measures of the intervention-regulatory policy. On the one side, there is subsidy production with the effort to coordinate scare production with demand at the given price level. While, on the other side, milk import and dairy products is enable at dumping prices and monopoly purchase so the growth of production volume is disabled. This is the reason that real milk prices are decreasing.

Although this work does not claim to work out the recommendations of regulatory-intervention policy, the necessity of looking for both short-term and long-term solutions in production and on the market of milk and dairy products impose as an urgent need because market reflections of the cited structure of measures and factors are extremely complex.

As for supporting basic inputs, Serbia has decided for periodical subsidies of chemical fertilizers and diesel fuel. Price subsidy of mineral fertilizers is a usual practice of many countries trying to increase agricultural production. The level of subsidy primarily varies depending on domicile fertilizer prices and the degree of efforts to stimulate production of basic farm crops. No doubt, this measure is one of the most efficient measures that essentially contribute to the growth of production volume. The subvention effects of mineral fertilizers can be evaluated

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[108] Share of expenses of the population for milk and dairy products in the total expenses for personal consumption is decreased from 4.6% to 4.1% from 2005 to 2011.
[109] Only one manufacturer participates in the total milk purchase with 36%.

through the relationship of increased fertilizer demand to the potential decrease of production costs and increased yields. Finally, efficiency of fertilizer subsidy amounts to subventions costs in relation to the effects reached by subventions. Unfortunately, there is no minimum of recording to evaluate the efficiency of fertilizers subsidy. We can talk about efficiency only indirectly drawing conclusions based on the growth of fertilizer consumption per area unit (from 120 to 230 kg/ha), although fertilizer price has been in constant increase in the last 12 years. The price growth of mineral fertilizers is a normal consequence of the growth of oil price and oil derivatives on the world market.

Regarding the fact that the domestic production of mineral fertilizers is stagnant and unstable since the privatization of production capacities, subsidy of fertilizer consumption in proportional relation represented, in fact, indirect import subventions.[110]

Finally, it is important to note that diesel fuel subsidy has no effect on production volume so it is surprising the persistence on this measure, especially if we have in mind the spread appearance of misuse right to subsidy. The basic effects of subsidizing fuel consumption are manifested in reducing production costs. However, having in mind the low share of fuel in the total costs which agriculture buy, it should stop the practice of subsidizing fuel for agriculture, and these resources redirect to subventions, which have expressive production effects.

Purchase subsidy of high quality breeding livestock and seed material is without doubt a justified measure, especially in the efforts to intensify livestock breeding.

Since 2004 the target program of bank subsidized crediting of farmers has been developed. The goal of this measure was a bigger commercialization of farms and their directing to bank resources of capital. However, as with most measures, because of the turn in the agrarian policy and support inconsistency, resources have not been multiplied, therefore, the efficient rural financial market has not been formed. The absence of rural financial markets causes that numerous institutions and funds at the local, provincial and republican levels are not efficient and do not realize aims they were established for.

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[110] In the total consumption, import of mineral fertilizers was 56%.

At the end, but important, we have to consider the question of the efficiency of foreign-trade system and policy. The foreign-trade policy in the field of agricultural and food products of every country are determined with two moments: a) trade, i.e. balance of payment, and b) efforts to protect its domestic production. Of course, it is not necessary to emphasize how much the policy of stimulating export and the policy of import protection should represent the consistent set of measures. Namely, as the volume and favourable structure of agricultural production are an essential factor, with direct effect on export increase, i.e. import reduction, so without appropriate conditions of disposal of goods for export and the absence of rational elements in the policy of import there is not adequate results in international exchange.

Simply said, in determining the way and volume of export subsidy, everything starts from the balance of payment situation, restrictive measures of importing countries, compensation for lower productivity of agriculture in relation to the countries competitors and the degree of supporting export of competitive products on the world market. In determining the height of subvention, it starts from the real evaluation of effects reached by subvention. Of course, we should always have in mind that import demand is relatively inelastic; therefore, the level of subventions should be defined according to these conditions. Without considering the reasons of real possibilities of subventions, Serbia defined five differentiated rates of export subventions, where the criterion is defined based on the level of processing. It is logical that products of higher phases of processing have the higher rates of subventions because the level of protection in export markets is higher for these products.

Subsidy rates are:

- Beef meat – 15%
- Pork – 10%
- Concentrated milk, butter and cheese – 15%
- Non-concentrated milk and cream – 20%
- Cereals and products – 5%
- Frozen fruits and vegetables –5%
- Tinned products from fruits and vegetables and juice – 10%
- Sugar –7%
- Honey – 10%
- Fodder – 5%
- Alcoholic drinks – 5%.

Except export stimuli, additional stimuli are allowed for vine and alcoholic drinks – 5.2%, cereals and products – 6.4%, fruits, vegetables and products –1.0% meat – 5.7%.

Unfortunately, there are no data for paid subventions according to individual products and groups of products, therefore, it was not possible to evaluate efficiency of export stimuli based on analytical elements already mentioned. However, it is not disputable that Serbia, from the net importer, has become the net exporter of agricultural and food products, since 2005 primarily due to the faster growth of production than demand and export subventions. In addition, it is not disputable that in the procedure of negotiations on joining WTO and EU, Serbia will be forced to change radically the system of direct export subventions so Serbia will have to introduce only the indirect support by means of the system of determining some forms of pricing.

After "opening" Serbia to the world since 2000 and the general market liberalization, its foreign-trade policy and system has been established based on the principle instrument of support to production prices. Import quotas for agricultural and food products has been revoked, while export quotas have been kept for about thirty most important products (wheat, corn, sugar, soybean, baby beef, etc.) in quantities surpassing domestic demand.[111]

With the general market liberalization, Serbia has reduced maximal customs tariffs from 40% to 30% in 2002, and six customs level makes the ad valorem customs structure (1%, 5%, 10%, 15%, 20% and 30%). Except these instruments, seasonal tariffs for some products, which are limited on maximal amount of 20%, are also applied.

It is logical that tariff positions with the highest tariffs (20% and 30%) are the basic agricultural and food products; therefore, the average customs rate for these products is higher than the customs rates for non-agricultural products. (In 2011, unweighted duty rate for agricultural and food products amounted to about 16%, and for the total import it was under 8%).

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[111] Some efficient alternative to import quotas tariff quotas has not been passed for unknown reasons. Tariff and non-tariff quotas can protect efficiently domestic production from excess import.

Serbia has kept variable levies for the most important agricultural and food products as a very efficient and sufficient flexible instrument to regulate import.

Method efficiency is seen in the possibility of continual harmonization of the protection level of domestic production, i.e. consumption, depending on import prices. The level of variable levy is determined according to the importance of products for the domestic market and they are paid for livestock and meat, milk and dairy products, eggs, wheat, oil crops and edible oils, fruits, vegetables and juices. We should remember that Serbia is on the threshold of the inevitable repeal of variable levies (WTO regulations) and that it is necessary to find out an efficient protection system. Judging by these facts, the only efficient alternative is the introduction of non-tariff quotas combined with prescription some forms of pricing.

EU reacted promptly on the "opening" of Serbia and, in 2000, approved unilaterally Autonomous Trade Preferences, exempting import from Serbia of some adding duties except for trout, wine, sugar and baby beef for which the quota is issued. However, in spite of trade reliefs, producers and exporters of agricultural and food products to EU are faced with rigorous procedures and standards for consumer protection and product quality.[112]

The unilateral EU concessions are practically transformed in the bilateral agreement by signing the Stabilization and Association Agreement obligating Serbia to reduce gradually customs duties in the next six years. Rough calculations show that customs load on import of agricultural products from EU is now (in 2013) amounts to 1.7%, on the average, of course, tariff load equivalent is some over and amounts to about 2.5%.[113]

No doubt, signing and implementation of the Stabilization and Association Agreement with EU has exposed agricultural producers to the increasing import competition. In addition, it is certain that the gradual harmonization of the volume of production, quality and phytosanitary standards has opened possibilities for a bigger volume of

[112] We should remember the EU warning on the origin of products from Serbia (sugar) and import meat ban because it did not satisfy health standards.

[113] Calculations are extremely rough with unclear methodology, but they are a good indication of liberalization of the foreign-trade exchange of agricultural and food products. More details in the study of USAID [7].

exchange of agricultural and food products, the witness of which is the continual growth of export and import of these products.

Besides EU, Serbia has the signed agreements on free trade with the CEFTA countries.[114] The custom concessions, preferential rates custom duties and quotas for agricultural and food products are harmonized with preferential custom duties. Except with the CEFTA countries, Serbia has signed agreements on free trade with Russia, Turkey and Belarus. The agreements with Russia and Belarus are completely applied, therefore custom protection is practically eliminated (about 1%). As for Turkey, the complete liberalization of foreign-trade exchange is not stipulated.

CONCLUSIONS

Without any intention of working out details, in the technical sense, the regulatory-intervention policy, the intention is to point out the most striking foundations on which a more efficient agricultural policy of Serbia would be based.

Starting from the realized volume and the tempo of agricultural production growth, tendencies in demand for agricultural and food products and the experience of developed countries, it is necessary to define and develop in the long run the principles of market interventions in the conditions of sufficiency of production for every of the basic product. Thus, interventions should include minimal quantities – those, which in the given conditions, do not have the provided disposal of goods. The development of regulatory and intervention policy must be based on the principle that protection be offer to those to whom it was intended.

In close connection with protection of agricultural production is the question of defining the target price as the landmark for direct payments. In determining the target prices, we should always have in mind the character of some products and uncertainty in production, low elasticity of demand and expressed elasticity of supply. These products do exert direct influence on market stability and the stability of livestock breeding. There is the need for these products to introduce the principle of interventions when market price falls or surpass the target price for some

[114] Albania, Bosnia and Herzegovina, Bulgaria, FYR of Macedonia, Croatia, Romania, Montenegro and Moldova.

percent. Namely, the character of these products enables to exert influence decisively, by material interventions, on the range where market prices move.

The situation essentially differs with other products (industrial crops and livestock breeding products). In essence, production is more stable, demand more elastic, but supply is not elastic, therefore, the function of interventions is essentially different. Interventions should be so outlined to have protection-stabilization character, indirect export subsidy and only exceptional and short-time subsidy of domestic demand. Intervention stated in this way can be very efficient if there is no big span between domicile and export prices. If the price span is significant, intervention can be applied if it is possible to limit efficiently production at the level of domestic demand.

At both first and the second group of products, urgency of outlining instruments and principles for interventions is more than obvious. Non-existence of adequate instruments will have above average market (price) reflections in the conditions of supply surplus and deficit.

Accepted EU and WTO obligations do not give a wide space to protect domestic market from import, on the one side, and barriers on the national border and unavoidable reduction of export stimuli limit sales on the foreign market, on the other side. We can draw the conclusion from this that Serbia is right before of creating instruments, which; on the one side, will protect domestic production, on the other side, it will exert influence on the increased competitiveness on the international market of agricultural and food products.

As for the policy of rural development, it is necessary to coordinate many institutions at the regional and local level so the unified vertical system could function. Generally, programs of rural development are well outlined, relying on development funds and stimulating investments in rural and undeveloped areas. No doubt, investments of these funds contribute to the creation and development of the financial market where agricultural and rural potentials can activate.

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