PRODUCTION CAPACITY OF FAMILY FARMS IN SERBIA AND EU COUNTRIES

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Abstract

The analysis of the production capacities of family farms holds an important place in an effort to perceive the economic and social factors which are important for their development. The agriculture of the Republic of Serbia and the agricultures of the countries in the region have a similar trait consisted in the participation of a large number of small estate farms. The ownership structure of family farms is one of the key factors of agricultural business efficiency. In the conditions of small-estate ownership structure, small farm area is a limiting factor in the application of contemporary agrotechnical measures. Apart from crop production, livestock fund has also had negative results per hectare of used area in the process of transition in the Republic of Serbia. It is reflected on the low level of agricultural productivity, as well as on the negative financial results of the farms.

The paper provides a comparison between the family farms production capacities and the EU-28 countries, in order to be able to take necessary and timely measures and to reform and structurally adjust the agrarian sector to the demands of the EU.

Key words: Republic of Serbia, EU-28, family farms, production capacities.
шти. То се одражава на низак ниво продуктивности пољопривредне производње, као и негативно на финансијски резултат гасдинства.

У раду је упоређиван производни капацитет породичних гасдинстава са земљама ЕУ-28 како би се на време преузеле неопходне мере и сектор аграра реформисао и структурно прилагодио захтевима ЕУ.

Кључне речи: Република Србија, ЕУ-28, пољопривредна гасдинства, производни капацитети.

INTRODUCTION

Agriculture is undoubtedly the mirror of the overall development of the economic society. It is therefore logical that the agriculture is given, by the state, the widest development support. It is essential that the farmers are provided with a stable and predictable business environment, but also a concrete support through the adequate measures of agricultural policy (more Bogdanov, 2015).

The most important subjects in organizing the agricultural production in Serbia are family farms. The main contingent of workforce that determines the overall development of agriculture is concentrated on family farms. Serbian agriculture is traditionally characterized by an unfavourable ownership structure, which is typical of family farms which, as the largest number of subjects in agriculture, predominantly determine its overall development (more Živković and Dimitrijević, 2006; Munčan and Božić, 2006). The development of these family farms has long been hampered by a variety of measures of agricultural policy, including limiting the size of the estate (identifying the land maximum), which changed (1953), only to be finally abolished in 1992.

The aim of the research was to define the state of the available production capacity of the family farms in the Republic of Serbia and neighbouring countries, as well as the EU 28. The research in this study is based on the results of the Census of Agriculture 2012, as well as official data for 2010 of EUROSTAT for the EU 28.

UTILIZED AGRICULTURAL LAND

Agricultural land covers a dominant part of the total land territory of the Republic of Serbia and represents one of the most important natural resources that determine overall and particular rural development.

Land as the objective condition of agricultural production and operation of any form of family farms is both a means and object of labour. Proper and rational use of natural resources contributes to the preservation of the existing and increase in the future economic well-being of the population, but also is the factor in environmental protection (more Jelić and Jovanović, 2009). In the structure of the total utilized
agricultural land (3,437,423 hectares) over 82% is owned by family farms and the rest belongs to legal entities and entrepreneurs (Graph 1).

Graph 1. Utilized agricultural land, according to the legal status of farms in the Republic of Serbia  
Source: Agricultural Census in Serbia 2012,  
Statistical Office of the Republic of Serbia, RZS

Overall agriculture farms in the Republic of Serbia are relatively small considering the average size of 5.4 ha of land used in 2012, which is significantly below the average in EU-28 of 14.2 ha. The illustration in the Graph 2 shows that the largest number of farms (over 76%) disposes with up to 5 hectares of utilized land. These farms should be a subject of special interest of agricultural policy. These are the farms which are engaged in different activities in the form of family business (tourism, trade services, trade, etc.), in the framework of rural households, and agricultural operation is secondary and not primary. Therefore, in such conditions, we cannot expect intensive production, the lack of which results in a low level of income. Low incomes of agricultural farms reduce the standard of living, not only of farmers, but also rural areas in general (Bright et al., 2000; Davis and Pearce, 2001).

This practice in the EU countries has long since been abandoned. Since the 70s of the last century in the European Union the amalgamation of land estates occurred in a planned, systematic and long-term manner (Mansholt Plan). The experience of the developed countries shows that the size of the estate is closely related to the level of development and technology needs and commodity production. It is the general opinion that, in order for the maximum profitability to be exhibited, the use of modern technology requires from the farms a minimum of 40 hectares of arable land or at least 40 cows per farm. Thanks to this approach adopted in the developed countries, in addition to small and medium-sized family farms, the number of medium and large commercial farms is constantly
increasing, which gradually develop into multinational companies (in addition to agriculture, other activities such as processing of agri-food products, but also transport thereof, are included).

The majority of farms have up to 1 ha (27.64%) and 2-5 ha (28.9%) land used. With the increase in the size of the land surface used, the number of farms rapidly decreases and the share of agricultural farms with over 10 hectares is only 8%, while in EU countries it is about 20%. In the structure of the total number of agricultural farms, the number of farms that have more than 100 ha of used land surface is almost negligible (Graph 2). In the EU-28, the share of farms per analysed intervals of used land with the surface of 20 hectares and above is uniform and ranges slightly over 3% for each interval (Graph 3).

Of the total number of agricultural farms, 47.23% use up to two hectares of agricultural land, similar to their share in the EU-28 (Graph 3). The share of the agricultural farms in Serbia, which have 2-10 hectares of used agricultural surface, is higher compared to the share of those in the EU-28 (43% in Serbia and 31% in the EU). With the increase in ownership structure, the position of the farms in Serbia is much worse than of the farms in the EU-28 (Graph 3).
Comparing the results of the Graphs 2 and 3, it can be concluded that in the EU countries, about 3% of the agricultural farms has over 50% of used land (Graph 4), which should be the aim and aspiration of the agricultural farms in Serbia.

In Serbia, the results of the Census of Agriculture from 2012 indicate that over 50% of the land used is concentrated on the farms of 2-20 ha. This is directly reflected in the low level of production results, which are far below those recorded in developed countries.

Negative ownership structure has impact on the size of the average farm. Therefore, the average land used per farm in the Republic of Serbia is to 5.4 ha, and 14.2 ha average in the EU 28. Serbia lags significantly behind this average, and compared to some EU countries such as the
Czech Republic (152.4 ha), Ukraine (90.4 ha), Slovakia (77.5 ha) the average of the Republic of Serbia is negligibly low (Graph 5). Serbia also lags behind the former Yugoslav countries, so the average in Montenegro is 6.3 hectares, Croatia 5.6 and Slovenia 6.5 hectares per holding. The consequences of this ratio are lower yields, and thus reduced production of major field crops. This explains the lower productivity in agribusiness.

Graph 5. Average utilized agriculture land per farm, (ha)

Source: EU-28: EUROSTAT (online data code: ef_kvaareg)
Agricultural Census in Serbia 2012, Statistical Office of the Republic of Serbia, RZS

Two-thirds of the land used (73.1%) in Serbia is classified as arable land and vegetable gardens, 20% meadows and pastures, orchards 4.8%, and very little areas under vineyards, gardens and other crops (Graph 6). On average, in the EU, the share of arable land is slightly below 60%, which indicates that in Serbia this share is much higher. In contrast, the share of the agricultural land used as permanent pastures and meadows in Serbia (20%) is significantly lower than the average of the EU-28 (about 34% in 2010).
Graph 6. Structure of the utilized agricultural land in the Republic of Serbia
Source: Agricultural Census in Serbia 2012, RZS

According to the scope and structure of the available farmland, Serbia is among the European countries with favourable land resources, since it has 0.7 ha of agricultural or 0.45 ha of arable land per capita. At the same time, the ratio of the surface area of arable land and permanent crops to areas of meadows and pastures (80%: 20%) is among the more favourable compared to other European countries.

The average area of arable land per capita in Serbia compared to the neighbouring countries, some of which are for many years now members of the EU, has a significant competitive advantage given that it is a much larger surface compared with those of other countries (Table 1).

Table 1. The average area of arable land in Serbia and neighbouring countries per capita

<table>
<thead>
<tr>
<th>Country</th>
<th>The average area of arable land per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serbia</td>
<td>0.56</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0.46</td>
</tr>
<tr>
<td>Romania</td>
<td>0.43</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>0.40</td>
</tr>
<tr>
<td>Croatia</td>
<td>0.33</td>
</tr>
<tr>
<td>Montenegro</td>
<td>0.30</td>
</tr>
<tr>
<td>Macedonia</td>
<td>0.26</td>
</tr>
</tbody>
</table>

Source: Calculation based on data of RZS (2012) and FAOSTAT (2010)

The Republic of Serbia has favourable soil and climatic conditions for the production of different types of fruit and grapes. The importance of this production lies in the fact that it enables a better use of the land at various locations and areas with less favourable soil and climatic conditions, including the land of poor physical, chemical and other characteristics, as well as areas with bigger slopes. The general assessment is that the existing crops are mostly extensive, because a large part of the orchards and vineyards are older than 20 years or in the peak of the exploitation period.
LIVESTOCK FUND

It is generally known that the livestock production is the most intensive branch of agricultural production and that it is of great significance, both for producers and consumers. Regardless of the fact that plant production represents the basis for the development of livestock production, livestock production has a retroactive impact on intensifying the plant production, and represents the momentum in regard to the development of agriculture as a whole. This production is the basis for the increase of intensity of agricultural production and its development provides the basis for building a wide range of processing capacities. Without a stable and developed livestock production there cannot be a developed agriculture as a whole. In the Republic of Serbia, due to a bad agricultural policy, crop production is favoured in relation to livestock, and on one side there is a surplus of some agricultural products (e.g., corn) that is directed towards export, and on the other side, animal production is constantly decreasing. Presently, it is at the level of only a quarter of the total agricultural production (28.6%). Otherwise, the share of 50% of livestock production in relation to the total agricultural production is the lower limit of sustainability. The rate of the decline in livestock production is two to three percents per year, and for the restoration of the livestock fund present in Serbia during the eighties, a minimum period of 10 years is necessary. An extremely difficult situation is present in the cattle, pig and sheep production.

Livestock production in Serbia is traditionally based on family farms. This type of farms participates with 91.1% of the total number of livestock, measured by the conditional heads of cattle. The total population of cattle, pigs and poultry has decreased during the last few decades. Today, Serbia cannot be a serious exporter in meat industry, if there is a decrease in the number of animals in relation to the eighties: in cattle breeding by a million heads, in pig production by 2 million animals and in sheep production by nearly one million heads. The total number of cattle in relation to the available arable land in Serbia is more than satisfactory and amounts to 30 livestock units per 100 ha of arable land, 33 livestock units per 100 hectares in Central Serbia and 24 livestock units per 100 ha in Vojvodina, while in the EU countries, this number goes up to 98 livestock units per 100 ha. The existing livestock fund, despite such a small number of livestock, still represents a significant development resource that can be improved.

Cattle production is the most important branch of livestock production in the world, also in Serbia. The total number of cattle in the world is growing continuously. The main initiators of the development of the cattle production are: income growth in the developing countries, population growth and urbanization (FAO, 2010). The number of cattle in our country has fallen below a million and is approximately 908,000 animals, which can be considered as an "extremely critical situation". One cannot expect the development of the overall agricultural activity if there is no development of
livestock production, and no development of livestock production without developed cattle breeding. Family farms, provided that there are 10 or more heads of cattle, can provide the primary production, i.e. cattle fattening and milk production. More than 60% of production in the EU includes such small family farms.

The number of pigs in the world is growing continuously. Pig production in Serbia had an uptrend until mid-eighties of the last century, when the total number of pigs reached 5.5 million. After that, the number of pigs decreased, especially in the region of Vojvodina. The number of pigs is characterized by a higher degree of variability than is in the case of cattle or poultry. The total number of family farms engaged in pig production is slightly higher than 350,000, which is more than double the number of family farms involved in cattle production. Over 93% of farms engaged in pig production have up to nine livestock units, which implies that this production is also largely developed on small family farms. Graph 8 follows the structure of livestock units per categories of livestock in the Republic of Serbia and Croatia, as the last country that joined the EU.

In the last few years, there has been a practice of a large import of pork. There are numerous reasons for that: very high price of corn as a basic nutrient in the diet of pigs, frequent price changes of fattening pigs causing less interest of agricultural producers for this type of livestock production. One of the problems is still present in the production on non-commercial farms, which do not have an adequate level of production of a number of cheap fattening pigs of uniform quality, which would cover the high relative share of the fixed costs (an inefficient utilization of the facility, equipment and animals).
Observed globally, poultry production recorded the fastest growth rate among all branches of livestock production. The total number of animals per year, on average, has increased by 3%. The poultry production in Serbia had a positive growth trend until the 80s when it recorded 30 million birds. Today, this number is just over 26 million birds. The relatively stable number of poultry in recent years is the result of neutralizing the decline in the number of poultry on the farms in central Serbia with an increase in the number of poultry on the farms in Vojvodina. The trend of this period indicates that the production of poultry is moving from the south to the north of Serbia. Today, in the structure of the total number of livestock units of the Republic of Serbia, poultry production accounts for nearly 15%, while in Croatia this share is much lower, only 5.84%. It is clear that a large share of the production takes place on small agricultural farms that are unorganized, uncompetitive and are manufacturers who can quickly close but also establish a new production cycle. However, none of these small producers can be considered a promising partner for a large and organized production, market stability and potential export business.

A quite large price variability, as well as a steady growth in the production costs contributed to the instability in the production of pork, poultry and beef, which led to an increased interest in the commercial sheep and goat breeding. The interest of farmers increased for the introduction of modern technological measures in order to achieve cost-effective production, but also to improve genetically the herd by introducing breeding of more productive, allochthonous sheep breeds primarily intended for meat production. However, the structure and the size of the sheep herds in Serbia are extremely diverse. A large number of sheep are reared only for the purpose of self-sustenance or sheep farming as a supplementary activity, while only in several herds more important economic benefits are realized and sheep farming is the main activity of the farm. Today in the Republic of Serbia, the total number of sheep is over 1.7 million head, and over 90% of
households have up to nine livestock units of sheep. Sheep production in Serbia has a long tradition and an intense regional component. In the total number of livestock units in Serbia, sheep production accounts for about 8%, which is almost the same as in Croatia (Figure 8).

**WORK FORCE IN AGRICULTURAL FAMILY FARMS**

Serbia is considered a country in transition with a relatively high share of agriculture in the total population, and it could be concluded that there is no deficit of agricultural work force. On the other hand, it is certain that the self-reproduction of the work force on the farms in certain areas of Serbia is not only questioned, but impossible.

Bearing in mind the unbreakable link between improving employment and rural development policy, it can be concluded that the problem of rural development so far in our practice is not given due attention. So Bogdanov and Stojanović (2006) have stated that it is only since 2005 that significant efforts in this field are invested into establishment of adequate state policy.

The villages of Serbia are inhabited by about 44% of the total population, and according to this criterion, Serbia is one of the most rural countries in Europe (Anufijev and Dašić, 2012). In Serbia today, a relatively large part of the population derives income from agricultural activities. In regard to the share of agriculture in the creation of wealth, Serbia is one of the most agrarian countries in Europe, next to Albania, Moldova and Bosnia and Herzegovina.

**Table 2. The work force on the farms in the regions of Serbia**

<table>
<thead>
<tr>
<th>Region</th>
<th>Members of the farm and permanently employed</th>
<th>The average age of the farm owner</th>
<th>Annual work/labour units per farm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Family farms</td>
<td>Legal entities and entrepreneurs</td>
</tr>
<tr>
<td>Serbia</td>
<td>1,442,628</td>
<td>1,416,349</td>
<td>26,279</td>
</tr>
<tr>
<td>Belgrade region</td>
<td>76,838</td>
<td>73,558</td>
<td>3,280</td>
</tr>
<tr>
<td>Vojvodina region</td>
<td>296,111</td>
<td>278,680</td>
<td>17,431</td>
</tr>
<tr>
<td>Region of Šumadija and West Serbia</td>
<td>628,585</td>
<td>625,267</td>
<td>3,318</td>
</tr>
<tr>
<td>Region of South and East Serbia</td>
<td>441,094</td>
<td>438,844</td>
<td>2,250</td>
</tr>
</tbody>
</table>

Source: Agricultural Census in Serbia 2012, Statistical Office of the Republic of Serbia, RZS

Although the absolute expressed employment in agriculture recorded high rates of decline (in 2012, compared to 2004, it was lower by 56%), the
share of agriculture in the total employment in Serbia is still very high, among the highest in Europe, at around 21%.

The information from the latest Census of Agriculture shows that the majority of agricultural farms (69%) have up to two members of staff on the farm who are engaged in agricultural activity. Also, during the year 2011/12, 646,283 annual work units have been invested in agricultural production, of which almost 96% by family farms (618,054). The share of different categories of the engaged workforce on farms in the total number of annual work units in agriculture is 44% by the owners of family farms, 47% by the family members and relatives of the holder, 4% by permanent employees on family farms and 5% of the seasonal workforce and persons engaged on contract.

Production in agriculture of Serbia is extensive: indicator thereof is a high input of work units at the farm level (1 AWU). Compared with the neighbouring countries, the consumption is much higher, so in relation to Romania twice as high (0.5 AWU), compared to the average of the EU-28 (0.8 AWU) is also significantly higher. It can be said that only in Montenegro, a slightly higher number of annual work units per farm in respect to Serbia (Graph 9) is recorded. This points to the need to intensify agricultural production in all its aspects.

Graph 9. The average number of annual work units (AWU) per farm in Serbia compared with the neighbouring countries
Source: www.popispoljoprivrede.stat.rs

CONCLUSION

Based on the results of the Census of Agriculture in 2012, it can be stated that the family farm as a socio-production-economic unit of agriculture in Serbia has the following properties:
- The structure of farms by size of land in the Republic of Serbia indicates to the dominance of small farms with little land use, which is reflected in the efficiency of their business operations;
- In the total utilized agricultural area over 80% is owned by family farms, and the rest belongs to legal entities and entrepreneurs;
- The majority of farms (over 76 %) has a 5 ha land used;
- The average size of land used per farm is 5.4 hectares, which is considerably less than the average in the EU-28 (14.2 ha);
- According to the scope and structure of available farmland, Serbia is among the European countries with favourable land resources, since it has 0.7 ha of agricultural or 0.45 ha of arable land per capita. At the same time, the ratio of the surface area of arable land and permanent crops to the areas of meadows and pastures (71% : 29%) is among the more favourable compared to other European countries;
- The share of the production value of livestock production in total agricultural production value was significantly lower than in most EU-28 countries. This conclusion is indicated by the ratio of the total number of domestic farm animals, as measured by livestock units and the total agricultural area;
- Family farms, in the period between the last two censuses, are characterized by a significant reduction in the livestock fund, and of all types of livestock. The issue of increasing livestock and improving the breed structure has become topic in the process of accession of the Republic of Serbia to the EU, and this issue must be given much greater attention;
- The highest number of agricultural farms (69%) has up to two members of staff who are engaged in agricultural activity.

It can be stated, taking into consideration the above mentioned, that for the further development of family farms and improvement of their overall structure a strategy is needed with a clearly defined policy for each type of family farm. Unfavourable agrarian structure is one of the most difficult problems of Serbian agriculture because agriculture production carried out on dispersed small family farms is irrational and non-profitable. Therefore, the enlarging of the land owned or used by family farms is one of the priority tasks of the new agrarian policy.

In addition, an important direction for future development of agriculture and food industry is the optimal use and conservation of available resources and capacity, building new, increasing the volume of agricultural production, changes of production structure in favour of intensive agriculture for export, and production of high-quality and above all healthy products.

Acting in accordance with economic principles, using positive experiences of the developed countries, taking into account the science and practice – this is the way without alternative.
REFERENCES


ПРОИЗВОДНИ КАПАЦИТЕТИ ПОРОДИЧНИХ ПОЉОПРИВРЕДНИХ ГАЗДИНСТАВА СРБИЈЕ И ЗЕМАЉА ЕУ

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Резиме
Аграрна политика једне земље је без сумње део опште економске политике и представља свесну, смислену и на чињеницама засновану групу мера и активности намењених на постигање одређених циљева у области пољопривреде. У том смислу је пожељно направити паралелу у активностима које је Србија предузела или их треба покренути како би се по многим индикаторима приближила нивоу развијености пољопривреде земаља ЕУ (виђи опширније Богданов, 2015, стр. 3).

У периоду транзиције многе земаље из нашег окружења су се определиле за европски концепт пољопривреде, који се заснива на породичним газдинствима, са снажном оријентацијом на развој руралних подручја и превазилажење њихових структурних ограничења (Малетић, Церанић & Поповић, 2011). Тај циљ и правац мора да има и Србија. Сходно томе, свака држава мора да дефинише оквир политичких и институционалних промена које доприносе ефикаснијем развоју пољопривредног сектора и благостању становника из руралних подручја. Пољопривредни Републике Србије је потребно да у што краћем року повећа конкурентност усвајањем нових знања и технологија, као и инвестирањем у постепено модернизацију опреме за рад (Anufijev & Dašić, 2012). Почетак рада на проналаску нових тржишта, прилагодити се правилима и стандардима Европске уније и Светске трговинске организације. Зато је потребно да се кроз подршку државе убрзају и прилагоде процеси преструктурања у пољопривреди.

Да би се стекао увид у производне потенцијале и компаративне предности појединих територија, као један од предуслова рационалног коришћења распосложеног ресурса у раду је илустровано стање производних капацитета пољопривреде у Републици Србији, на основу последњег пописа (2012), у односу на исте у земаљама ЕУ.

Сходно томе, мора се најпре констатовати да најзначајнији субјекти у организовању пољопривредне производње у многим земаљама у окружењу, те и у Србији, јесу породична газдинства. На њих је економски концентрисан основни контингент радне снаге који опредељује укупни развој пољопривреде. Међутим, највећи број пољопривредних газдинстава (69%) у Србији има једног до два члана газдинства или запосленог који обављају пољопривредну активност, што није доволjan предуслов за обављање интензивних производња. У Републици Србији има 631.552 пољопривредних газдинстава која располажу са 3.437.423 ха коришћеног пољопривредног земљишта или 5,4 ха по газдинству. Док Европска унија, са својих 28 чланица, укупно има 12,2 милиона пољопривредних газдинстава која располажу са 174,1 милионом хектара коришћеног пољопривредног земљишта или 14,2 ха по газдинству. И у другим основним пољопривредним индикаторима Србија оставиће знатно лошију позицију, због чега се мора озбиљно приступити процесу преструктурања пољопривреде.