Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 17, Issue 2, 2017
PRINT ISSN 2284-7995, E-ISSN 2285-3952

INDICATORS WHICH MEASURE A LEVEL OF SIGNIFICANCE OF AGRICULTURE IN SERBIA

Jonel SUBIĆ[1], Biljana GRUJIĆ[1], Marijana JOKSIMOVIĆ[2]

[1]Institute of Agricultural Economics, 11060 Belgrade, 15Volgina Str., Serbia, Email: jonel_s@iep.bg.ac.rs, biljana_g@iep.bg.ac.rs
[2]John Naisbitt University, 11070 Belgrade, 8 Boulevard Marsala Tolbuhina, Serbia

Corresponding author: jonel_s@iep.bg.ac.rs

Abstract

Although agriculture is a significant activity for every country, many are frightened out of being engaged in this activity, due to insufficient importance given to it. This paper will show three indicators, by which can be measured the significance of agriculture for a certain country, and these are: the share of rural population in total population, the share of employed population in agriculture in total number of employees and the share of agriculture in creating a gross domestic product (GDP). It's also an important indicator of agricultural share in foreign trade exchange. The obtained data will be shown for the period 2012-2015 and commented in accordance with the obtained values. Processed results did provide the following results (the change index 2015/2012): the share of rural population in total population was decreased for 2.5 percentage points (p.p.), the share of population employed in agriculture in total number of employed population was decreased for 2 p.p., while a chain index of GDP share in agriculture is at extremely low level and in the year 2015, in regard to the year 2014, was lower for 7.5 p.p. Declining values of indicators only point out to a low level of significance of agriculture for Serbia, which is characterized by favourable natural factors for farming. An indicator „the share of agriculture, forestry and fishery in total export of Serbia" is the only one which records the increasing values in the period 2013-2015 for 1.2 p.p., but in regard to the initial year 2012, is yet lower for 1.5 p.p. The conclusion is drawn, by using the mathematical-statistical methods and research methods, that agricultural activity for Serbia is not sufficiently important.

Key words**:** *agriculture, GDP, rural population, indicators, export*

INTRODUCTION

Three quantitative indicators were shown in this paper: the share of rural population in total population, the share of employed population in agriculture as an activity in total number of employed population and the contribution of agriculture in the creation of GDP. Equally important for a country is the export structure of agriculture and food industry and the share in total export of a country. These indicators can help to determine how farmers and the state attach importance to this activity, which there are favourable conditions for.

Agriculture is a traditional economic activity that people have been engaged in since olden times, and at the same time the only activity which have implied the performance of production process. Over time, it has become significantly important, the most important economic branch. Nowadays it is a very significant field of production with the fact that it is significantly modernized, and doing business is made easier by the introduction of a modern technical-technological process of production.

Census of Agriculture, which was conducted in Serbia in the year 2012, has only determined a fact on its underdevelopment and neglect. It is obvious that plots are fragmetized, holdings are old people's, 1-2 elderly members live in them, and there prevail family agricultural holdings.

Only 0.5% of a total number of holdings is holdings of legal entities and entrepreneurs. According to a legal form, there are the most of limited liability companies 34%, entrepreneurs 16% and agricultural cooperatives 13% (SORS, 2013) [7].

The author Bogdanović M. (1967) [1] considers that the significance of agriculture decreases with the development of economy. More specifically, underdeveloped economy of a country implicates a high percentage of rural population, population employed in

agriculture and a high percentage of agriculture in the creation of GDP and *vice versa*.

The obtained results show that agriculture for Serbia is not a significant activity, because there constantly decreases a number of rural population, population employed in agriculture, while the share of agriculture in the creation of GDP varies permanently.

MATERIALS AND METHODS

The following indicators were used for the analysis of indicators, for measuring the significance of agriculture for a country: total number of population, total number of agricultural population, total number of employed population, total number of population employed in agriculture, contribution of agriculture in the creation of the GDP, total export and import, the share of agricultural activity in total export and import, as well as the balance of foreign trade exchange of agriculture and food industry. There was also analysed the share of rural population in total population, the share of rural population employed in agrarian sector in total number of employees.

The analysed indicators were collected for the period 2012-2015 by searching the internet, journals and other professional publications Data were collected from the Statistical Office of the Republic of Serbia [5,6,7,8,9,10,11,12,13,,14,15,16], and there were used publications issued by the relevant financial institutions, and some calculations were done by the authors and represented graphically and/or tabulated.

RESULTS AND DISCUSSIONS

Considering that the Republic of Serbia is predominantly an agricultural country, of particular importance is the accession to the European Union (EU) in order to ensure the additional financial support. First of all, it has to adjust its agricultural policy to the EU agricultural policy (*CAP – Common Agricultural Policy*) [2].

Agriculture and rural development (as a particular section) is the most demanding section for Serbia, since regulations that regulate this field represent almost one third of all EU regulations. These regulations imply all issues related to subsidies for farmers, marketing and sale of agricultural products. The regulations also refer to legislation in the field of protection of geographic origin and the production of traditional products[2].

During the screening, several very important problems were identified. Probably the most important adjustment to the EU practice concerns the issues of farmers' subsidies, which in EU implements at regional level and is very complicated regarding its structure, while it identified different categories of aid recipients, as well as the conditions under which they can get an aid. During the screening, a special attention was paid to the explanation of innovation introduced with a reform, which was very important for Serbian delegation, since Serbia will have to transfer them completely into Serbian legislation and include them in its practice before it accesses the EU. As an especially prominent issue within the screening imposes the issue of environmental protection standards in the sector of agricultural production, which has become a strict condition in order to receive subsidies.

First indicator for measuring the significance of agriculture for a certain country is a ratio between total and rural population. These indicators trend will be shown by a chain index. These indicators record an inter-annual decline in both categories (Table 1).

Table 1. Chain index changes of total and rural population in Serbia (2012-2015)

Description	2012	2013	2014	2015
Total population	-0.5	-3.4	-0.3	-0.3
Rural population	-1.8	-7.2	-1.6	-1.2

In the year 2012, an inter-annual rate of changes in the total population was decreased for 0.5%, then in the year 2013 an additional decline was 3.4% in regard to 2012, while in 2014 and 2015 this indicator was stagnated (constant decline of 0.3%).

[2]http://europeanpolicy.org/cinjenice-o-eu/institucije/180-dokumentacioni-centar/cep-pogled/418-poljoprivreda-u-srbiji-sta-mozemo-ocekivati-u-procesu-pristupanja-eu.html

In 2012, the inter-annual rate of changes in the total population was decreased for 1.8%, in the year 2013 was recorded the highest decline of 7.2% in regard to 2012, and in 2014 was decreased for 1.6%, i.e. for 1.2% in 2015. After the described inter-annual rate of changes in the total population also the share of agrarian population in the total population will be described (Fig. 1).

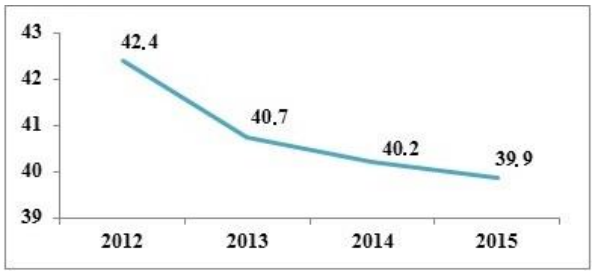

Fig 1. Share of rural population in total population in Serbia (2012-2015, in %)

The description indicates that the share of agrarian population in total population has decreased for 2.5 p.p. (percentage points), and more drastic decline was recorded in 2013 in regard to the year 2012 (value of 1.7 p.p.).
The second indicator implies the relation of totally employed population and the population employed in an agrarian sector. Variation of these indicators will be shown tabulated at the inter-annual level (Table 2).

Table 2. Chain index changes of employed population and total employed in agriculture in Serbia (2012-2015)

Description	2012	2013	2014	2015
Total number of employees	-0.5	-3.4	-0.3	-0.3
Employed population in agriculture	-1.8	-7.2	-1.6	-1.2

The inter-annual rates of changes in the total population record fewer declines in regard to the population employed in agriculture.
In the year 2013, the biggest decline of totally employed population was obvious (3.4%) in regard to 2012, while the decline in other years was ranged from 0.3% to 0.5%.
The highest decline of population employed in agriculture was recorded in 2013, and was amounted 7,2%. In other years, the decrease has ranged from 1.2% to 1.8%.
The next description (Fig.2) will show changes in the structure of population employed in agriculture in the total employed population.

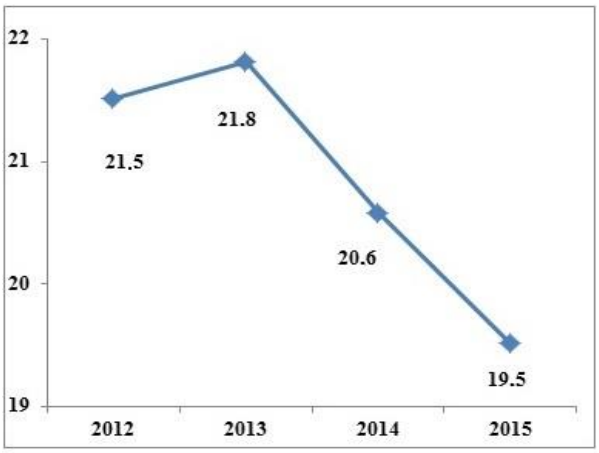

Fig. 2. Share of population employed in agriculture in total number of employees in Serbia (2012-2015, in %)

The description shows that the share of population employed in agriculture in the total employed population was decreased for 2 p.p. in the year 2015 in regard to the year 2012, and more drastic decline was recorded in 2014 in regard to 2013 in a value of 1.2 p.p.
The third indicator for the interpretation of agricultural significance is the contribution of agriculture in the creation of GDP value in agriculture.

Table 3. Chain index changes of GDP in agriculture of Serbia (2012-2015)

Indicator	2012	2013	2014	2015
GDP	-0.8	3.3	-2.0	0.9
GDP excluding agriculture	1.1	1.6	-2.5	1.9
Agriculture	-0.8	3.3	-2.0	0.9

There can be noticed, by analysing only one economic activity (Table 3), that this indicator has recorded also positive values (unlike the previous two, which has recorded only negative values).
After the decrease in agricultural activity contribution in the creation of GDP in 2012 in regard to the year 2011 (for 17.3%), the year 2013 was concluded with the sudden increase of 20.9% in regard to 2012. Slightly lower increase was recorded in 2014 in regard to 2013 for 2.0%, and in the year 2015 the decrease was for 7.5% in regard to 2014. Such large fluctuations point out to the significant share of agriculture in the creation of GDP value. Causes of these changes can be following factors[3]:

[3] Petrović, P., Brčerević, D., Minić, S. (2016): *Ekonomski oporavak, zaposlenost i fiskalna konsolidacija: pouke iz 2015. godine i izgledi za 2016 i 2017. godinu*, str. 8. [4]

-Drought in 2012 and 2015 have affected occassionally large decline of agriculture,
-Floods in 2014, which have led to the temporary decline in energy due to immersed coal mines.

For the year 2016 is planned that the contribution of agriculture to the GDP growth is going to be 0.8 p.p. Regarding that in 2015 the contribution of agriculture to the GDP growth was recorded the decline of 7.5%, there can be concluded that the planned shift in 2016 was satisfying. This positive trends can be assessed as a revival of agricultural production after drought in 2015. The decline of agricultural production in the GDP structure in 2015 in regard to 2014 has appeared due to the impact of drought on autumn crops, while the other sectors of GDP has left at the same level in regard to the year 2014[4].

Besides three mentioned indicators for the determination of level of agricultural significance in a specific country, there can also be helpful the share of agriculture in total foreign trade exchange and the structure of agriculture and food industry of a country (Tables 4 and 5).

The share of export within the agriculture-forestry-fishery (AFF) activity in total export has ranged from 5.9% in 2013 to 8.6% in 2012. It means that the export of AFF has decreased in the period 2012-2013, while since the year 2014 has recorded a constant growth. The share of AFF activity export in total export has ranged from 2.9% in 2013 to 3.2% in 2015. More accurately, in the period 2012-2013 this share has decreased, so it has recorded a minimum growth since 2014.

Table 4. Participation of agriculture, forestry and fisheries (AFF) in total exports and imports of Serbia (2012-2015, in %)

Year	Share of exports of AFF in total	Share of imports of AFF in total
2012	8.6	3.1
2013	5.9	2.9
2014	6.7	3.1
2015	7.1	3.2

[4] Foundation for the Advancement of Economics (2015): *Economic activity*, Quarterly monitor no. 43, October-December, 2015, p. 13. [3]

In regard that the share of export is higher than the share of import, there can be concluded that this activity records a surplus in foreign trade exchange, and thereby also contributes to equilibrium of balance of payments. In table 5 was given a description of trends of foreign trade exchange of agriculture and food industry of Serbia in the period 2012-2015.

Table 5. Chain index changes of foreign trade of agriculture and food industry in Serbia (2012-2015)

Indicator	2012	2013	2014	2015
Export of agriculture and food industry	21.0	-0.1	14.1	14.4
Total export of country	15.2	25.6	5.1	11.0
Import of agriculture and food industry	28.9	1.7	15.4	5.8
Balance of foreign trade in agriculture and food industry	12.6	-2.2	12.6	25.5
The share of exports of agriculture and food industry in total exports (in%)	5.0	-20.5	8.6	3.0

In the table we can see:

-Export of agriculture and food industry records a positive inter-annual rate of growth from 14.1% to 21.0%. The exception is the year 2013, when was recorded a minimum decline of export for 0.1% in regard to the year 2012,

-Total export of a country records the positive values that range from 11.0% in 2015 to 25.6% in 2013, or the increase of 14.2% on average annually,

-Import of agriculture and food industry records a positive inter-annual growth that records higher values than export, and it was approximately 13.0% annually. Surely, it is evident that it is about five times lower in 2015 than in 2012 (decreased from 28.9% to 5.8%),

-Due to significantly higher import than export of agriculture and food industry in 2013 in regard to other years, there was recorded the decrease of foreign trade exchange balance of agriculture and food industry for 2.2% in regard to 2012. The highest inter-annual growth was realised in 2015 and is higher for 25.5% in regard to the year 2014,

-Chain index of trends of agriculture and food industry export in the total export was achieved a significant decrease of 20.5% in 2013, in regard to the year 2012, while other years had the positive growth rates. For example, the growth of 8.6% was realised in 2014 in regard to 2013.

Taking into consideration all previously stated, there can be concluded that agriculture is an immensely important branch, which should be developed and modernized, because that is the only way to provide appropriate results.

CONCLUSIONS

Number of indicators for measuring the significance of agriculture is multiple for a country, but these have singled out as the most significant. Surely, each of them gives results that can be comparable and contribute in solving problems that can occur in agriculture.

The analysed indicators point out that agriculture is not sufficiently important for our country, although has all natural characteristics necessary for its performance.

An indicator „the share of rural population in total population“ shows a constant decline of the total rural population, which migrates to towns or leaves the country, because they can't see purpose in staying in the countryside and their engagement in agricultural production.

An indicator „the share of rural population employed in agriculture in the total number of employed population“ shows a decreasing trend, which means that decreasing number of rural population employs in this activity.

An indicator „the contribution of agriculture in the creation the GDP“ is the only indicator that was shown the significance of agriculture, the state realizes the contribution in the creation of the total GDP.

An indicator on the share of export and/or import in the total foreign trade exchange is equally significant. It is commendable that this activity makes a surplus, which was the lowest in the year 2013, due to import which was higher than expected.

Generally, it is necessary to make an effort and invest work in order to inform farmers on the significance of agriculture for every country.

Serbia awaits a very difficult process of adjustment, to which should be paid great attention first of all due to the economic significance of this sector. During this period of time, Serbia will have a chance to realize better its status in this sector and get specific advices in order to prepare for reforms as better as it is possible.

ACKNOWLEDGEMENTS

The work is part of research project no. 46006: "Sustainable agriculture and rural development in terms of achieving the goals of the Republic of Serbia within the Danube region", funded by the Ministry of Education, Science and Technological Development of Republic of Serbia.

REFERENCES

[1] Bogdanović, M., 1967, Ekonomika poljoprivrede Jugoslavije, Savremena administracija, Beograd.

[2]European Policy Centre, http://europeanpolicy.org/cinjenice-o-u/institucije/180-dokumentacioni-centar/cep-pogled/418-poljoprivreda-u-srbiji-sta-mozemo-ocekivati-u-procesu-pristupanja-eu.html

[3]Foundation for the Advancement of Economics, 2015, Economic activity, Quarterly monitor no. 43, October-December, 2015.

[4]Petrović, P., Brčerević, D., Minić, S., 2016, Ekonomski oporavak, zaposlenost i fiskalna konsolidacija: pouke iz 2015. godine i izgledi za 2016 i 2017. godinu, Fiskalni savet Republike Srbije, mart 2016, Beograd.

[5] SORS, 2012, Labour Force Survey, October 2012, Statistical release no. 349 from 28.12.2012., Belgrade.

[6] SORS, 2012a, External trade of Serbia - December 2011, Statistical release no. 24 from 31.01.2012., Belgrade.

[7] SORS, 2013, Census of agriculture 2012, Book I, Belgrade,http://pod2.stat.gov.rs/ObjavljenePublikacije/Popis2012/PP-knjiga1.pdf

[8]SORS, 2013a, Labour Force Survey – October 2013, Statistical release no. 359 from 30.12.2013., Belgrade.

[9] SORS, 2014, External trade of Serbia – December 2013, Statistical release no. 23 from 31.01.2014., Belgrade.

[10]SORS, 2015, Estimates of population for the Republic of Serbia 2014, Press release from 15.07.2015., Belgrade.

[11] SORS, 2015a, Labour Force Survey – IV quarter

2014, Statistical release no. 282 from 23.10.2015., Belgrade.
[12]SORS, 2015b, Statistical Yearbook of the Republic of Serbia 2014, Belgrade.
[13]SORS, 2016, Estimates of population for the Republic of Serbia 2015, Press release from 30.06.2016., Belgrade.
[14] SORS, 2016a, Labour Force Survey – IV quarter 2015, Statistical release no. 046 from 29.02.2016., Belgrade
[15]SORS, 2016b, Statistical Yearbook of the Republic of Serbia 2015, Belgrade.
[16]SORS, 2016c, External trade of Serbia - December 2015, Statistical release no. 23 from 29.01.2016., Belgrade.