

Development of Bulgarian agriculture within the CAP in the EU 2007-2020 in the context of the green deal, farms and employed people, relative to location index for rural areas of the South Central Region

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Abstract. Agriculture occupies a basic place in the economy of Bulgaria. A key sector on which a large part of production in the country is based, regardless of the political or socio-economic processes taking place during different time periods. The purpose of the scientific development is to present the development of the Gross value added (GVA) of agriculture in Bulgaria for the period 2007-2020, base prices, subsidies for production and agricultural labor in annual work units (AWU). The research includes the application of methodology and analysis of the Location Index (IL) of agricultural holdings and employed persons in the rural areas of the South Central Region (SCR) for the specified period, as well as the influence of the "green deal" as a socio-economic factor. Makes a comparative analysis of the employed persons, in relation to the region and the country during the research period.

1 Introduction

The strategic plan for the period 2023-2027 will largely support Bulgarian agriculture, improvement of sustainable development in the Agriculture sector and non-agricultural activities in rural areas of the country will lead to an increase in incomes, support the improvement of the competitiveness of the above-mentioned administrative structures. Strengthening the socio-economic role of the RA will largely allow the use and application of the entire range of natural resource potential aimed at activities specific to these areas [1].

In Bulgaria, for the period 2007-2016, the received invoiced income per hour of labor invested in agriculture shows a permanent lag, compared to the average level in the country and with other economic activities. In 2016, in agriculture it was BGN 4.5/hour, while for the economy as a whole it was BGN 5.3/hour. From 2007 to 2016, the results show that the relative share of intermediate consumption in gross output in 2009 was the highest at nearly 67%. After 2013, this share ranges from 59-62%. This relative share of intermediate consumption affects the performance economic indicators (SPDARARB 2023-2027).

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The research and analysis we do is aimed at presenting the economic picture, in the smallest administrative units according to the NUTS classification, which examines the socio-economic situation in the RA of the country in the context of the same in the SCR and is a basis for development and targeting of investments in the sectors of these territories under the Strategic Development Plan 2023-2027 [2].

Table 1. Socio-economic structure for 2020 in RA of SCR

District	Territory		Settlements		Rural areas	
	area km ²	%	number	%	number	%
Bulgaria	111001		5302		232	
SCR	18219,14	81,46%	919	47,36%	51	21,65%
District Kardzhali	2631,26	14,44%	352	38,30%	6	12,00%
District Pazardzhik	3822,28	20,98%	85	9,25%	11	20,00%
District Plovdiv	5204,63	28,57%	155	16,87%	16	32,00%
District Smolyan	4228,60	23,21%	154	16,76%	9	18,00%
District Haskovo	2332,37	12,80%	173	18,82%	9	18,00%

Source: NSI and authors' calculations

In the table 1 shows the rural areas of the districts as a percentage of the total population for the rural areas of the SCR. The largest share in terms of territory is the rural areas of the Plovdiv region (28.57%), and the smallest - RA of the Haskovo region (12.80%). The RA of Kardzhali region has the largest share in terms of number of settlements (38.30%), and the smallest – RA of Pazardzhik region (9.25%). The RA of Plovdiv region has the largest population and the highest density. Research and analysis of RAs are necessary to determine their weaknesses and strengths for the adoption of strategic programs for their future development [3]. The number of the population in these areas is essential for the socio-economic status, which in turn is directly related to the development of agriculture and non-agricultural activities in the RA, employment on the one hand and the creation and functioning of enterprises and farms.

2 Methods

The Index localization (IL) is used to analyze and compare regions, municipalities and smaller settlements (rural areas) according to economic indicators of production and employment in the relevant sectors of the economy [4]. On the basis of IL, specific sectors of the economy can be analyzed. The index in this situation refers to the analysis of holdings and employees in the RA of the SCR according to the NUTS classification for the period 2007-2020. If IL is higher than (unit) 1, the production of the holdings and the employed in the sector - Agriculture, forestry and fisheries, will have a higher concentration, which is an indicator of the localization of the relevant economic or social activity. For a factor less than 1, localization processes are absent or have a low concentration. The results of the analysis of the specialization for RA of the SCR in Bulgaria are directly related to the scale of the study. The lower the rank of scientific research, economic or social activity, for the coefficient of specialization in a given territory, the higher and more accurate the economic values or indicators. It reveals the real socio-economic picture of the state of the investigated and analyzed municipality, farms, production and occupied places.

$$IL = (S_j / N_j) / (S / N) = (S_j / S) / (N_j / N) \quad (1)$$

Where:

S_j – the number of employed/holdings in the sector in the area

S – the number of employed/holdings in the processing industry in the area

N_j – the number of employees/holdings in the industry in the country

N – the number of employed/holdings in the manufacturing industry in the country

The localization index is a model used for comparison, analysis and inference, and in this case it refers to the RA of the SCR in Bulgaria over a period of thirteen years, examining the holdings and persons employed in the agricultural sector and the area's specialization. The development uses an ethereal approach, statistical information from MAFF, comparative analysis of the base, economic results [5]. Research is applicable, applying a comparative analysis, between the EU when using the NUTS classification and for smaller administrative-territorial units of the same. Microsoft Word and Excel were used in the research and analysis of statistical information.

3 Results

The publication examines and analyzes the activities of agricultural holdings, the employed persons in the RA of the SCR for a period of thirteen years, as well as agricultural labor in annual work units (AWU), income by factors in total per 1 AWU, output from the agricultural sector in million BGN, GVA at base prices in million BGN and other subsidies on production in million BGN. In fig. 1 and 2 visualize agricultural holdings and employed persons in the RA of the SCR for the above-mentioned period.

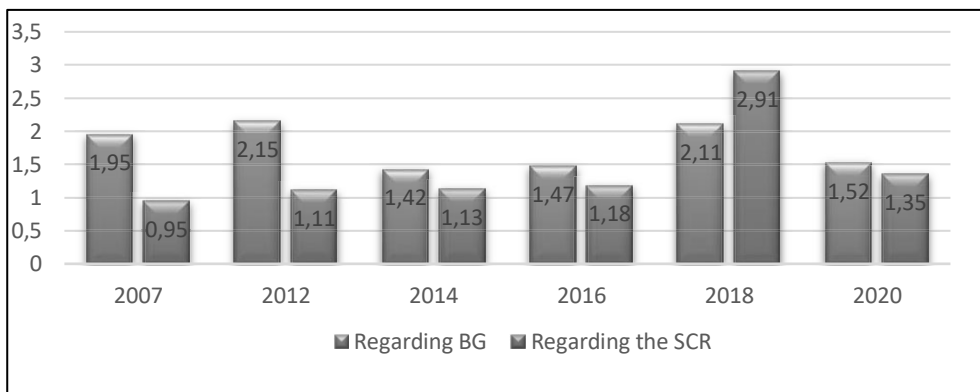


Fig. 1. IL of Agricultural holdings RA of SCR for the period 2007-2020

Source: NSI and authors' calculations

During the original survey period of 2007, the area's agricultural holdings, relative to the country, had a factor of approximately two. This period coincides with the beginning of the global economic crisis [6]. Depending on the region, the coefficient approaches unity, regardless of the change of objective factors, rural areas retain their specialization. The next stage of the research coincides with the exit from the economic crisis (national and global plan), as a result of which the coefficients show growth in both indicators - relative to the country and the region. In 2014, the analysis shows a minimal decline compared to the previous year, compared to the country's coefficient of 0.73 points, the region has a slight increase compared to the previous year by 0.3 points - rural areas retain their specialization. In the 2016 survey period, the analysis shows a stabilization of indicators, with the minimum increase for the country being 0.5 points, for the region being 0.5 points. Throughout the study period 2008-2020, analyzing the localization index takes into account the specialization of rural areas in agricultural holdings. In 2018, there was the largest growth in the number of

farms, both in number and specialization, due to the increase in European subsidies aimed at this type of farms [7]. Compared to the country, the growth from the previous years of research is approximately one hundred percent, and compared to the region, it also approaches this indicator. At the end of the study, the values of the coefficient of specialization are returned to the average values for the country and the region. Agricultural holdings are an internal factor for the development of the rural areas of the South Central Region in Bulgaria. At the initial stage of the survey, agricultural holdings for 2008 were 10 920 and employed 80 260 people. In the period 2008-2018 (for 2014, the number of agricultural holdings in Bulgaria was 176 230, for the SCR they were 36 510 in number, including 22 890 in the rural municipalities in the same territory) there was an increase in holdings by 40.23 % or as of 2018, their number is 27 140. At the end of the research period for 2020, there is a decline in agricultural holdings in the region and rural municipalities of the SCR compared to those of the country. In relation to Bulgaria for the same year of the study, compared to the initial period of 2007, there is a drop of 0.43 points, and in relation to the region there is a minimal increase of 40 points, that is, I specialize in the rural municipalities of the region.

Examining and analyzing the state of farms in a country and in particular, the same ones in the SCR, attention should also be paid to the people employed in those in them. Those employed in the subsectors and sectors of agriculture, forestry and fisheries are changing, in terms of numbers to the greater extent. Over 90% of farms are private, some of them are family owned, and employee reporting is quite difficult and inaccurate due to a number of socio-economic reasons. In fig. 2 visualizes the Index of location of employed persons in the rural areas of the SCR for the period of 2007-2020, compared with that of the country and the region.

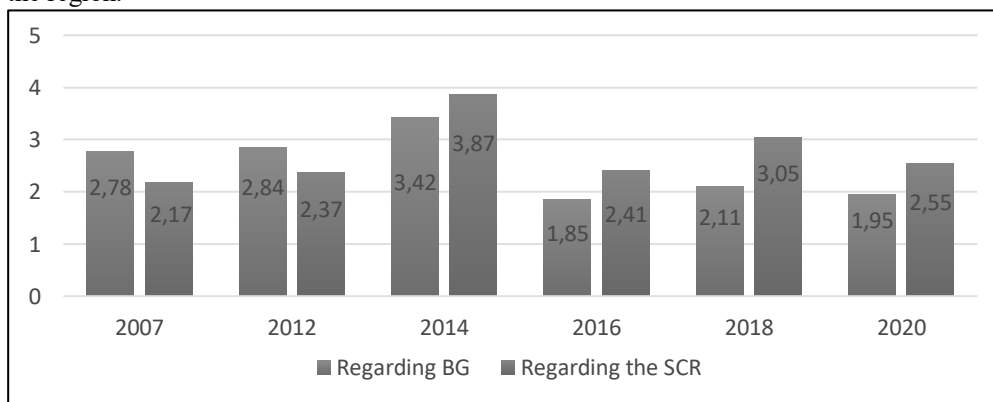


Fig. 2. IL of Employed persons in RA of SCR for the period 2007-2020

Source: NSI and authors' calculations

In fig. 2 is a visualization of the IL of employed persons during the period 2008-2020, in the rural municipalities of the SCR, compared with those of Bulgaria and the region. During the initial survey period in 2007, the employed persons in rural areas compared to the country report an indicator above two points, for the region there is an increase of minimum values above two coefficients, there is specialization. The first year of the survey, both farms and employed persons, coincided with the beginning of the last global economic crisis (2008-2010). However, the external factors worsened during this period, in the rural areas of the SCR and the IL country there are positive values. During the next stage of the research, the number of employed in rural areas compared to the previous year of the country has a minimum growth of 0.06 points, the region has a growth of 0.17, that is, there is specialization. In 2014, the analysis shows the highest employment growth in the entire country for the study period, specialization is maintained, and employment growth is also

reported in the region itself. For 2016, there is a high concentration of employed persons compared to the country and the region. In 2018, there was an increase in the localization coefficient compared to the previous period by 0.25 points for the country and 0.65 for the region – this increase coincides with an increase in the number of farms for the same year. At the end of the 2020 period, employed persons in the RA of the SCR and those in the country reported IL values above one. There is a specialization of persons employed in agriculture, throughout the period of research, which shows the maintenance of the population's tradition of maintaining interest in agricultural activities.

The structure of agriculture in the EU member states develops on the basis of specific socio-economic, natural conditions (climatic characteristics) and regional features of the ethnic structure for certain spaces [8]. The invoices of the natural geographical and economic environment determine the development of the use of annual work units (AWU), based on the employment for a whole year, indicated in fig. 3 for Bulgaria within a thirteen-year period.

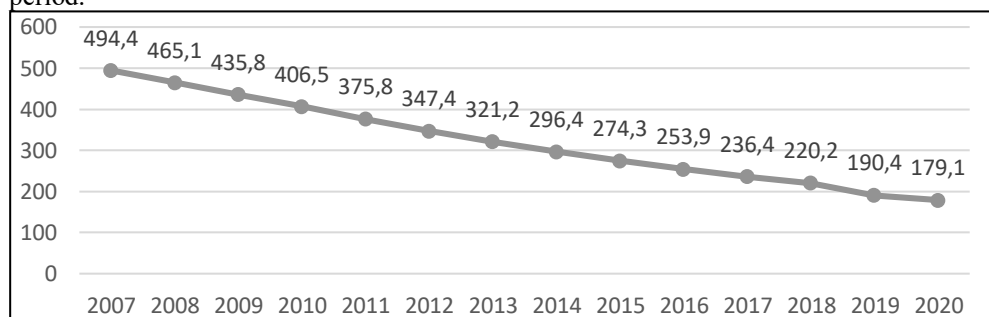


Fig. 3. Agricultural labor in annual work units in thousands for Bulgaria

Source: MAFF

During the entire period from 2007 to 2020, the amount of labor invested in agriculture is decreasing from 494.4 thousand, AWU to 179.0 thousand. The decline of the AWU for the study period has a smooth downward trend, due to socio-economic conditions and events taking place on the territory of the country within the framework of the study. In the thirteen years since 2007, labor has declined by 63.8%.

The research income by factors in total of 1 AWU, indicated in fig. 4 is based on an analysis to assess the impact of economic size on the efficiency of agricultural holdings. The analysis of the economic efficiency of farms includes the period of thirteen years from 2007 to 2020 [9].

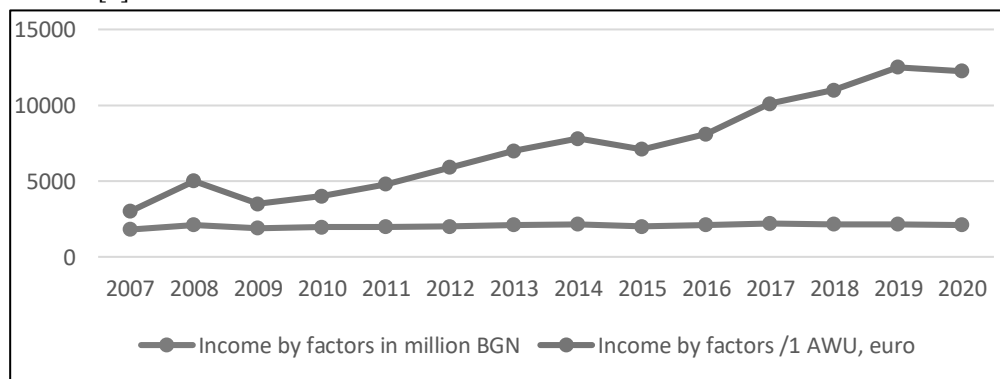


Fig. 4. Income by factors in total per 1 AWU for Bulgaria

Source: MAFF

Incomes by factors in total for 1 AWU for 2007-2020 in millions of BGN during the research period, the trend moves in an almost horizontal line, without significant changes in the studied indicator for the country. The same indicator mentioned above for the same period, measured in euros, shows significant changes over time. The trend is upward, with a minimal drop recorded in 2009, which coincides with the last World Economic Crisis. In the following years until 2015, there is an increase in the trend, with the same year marking a minimal decline, due to internal social, political and economic changes. By the end of the studied period, there was an increase in AWU.

The Gross value added (GVA) of the agricultural sector follows the trends of changes in production. For the period 2000 - 2009, the agrarian sector creates GAV in the range of BGN 2.8 - 3.5 billion per year [10]. The year with exceptionally good agro-climatic conditions was 2008, when the GVA from the agricultural sector reached its highest value - BGN 3 990.2 million (MAFF 2007-2020). In fig. 5 visualizes GVA and Intermediate consumption for the Agriculture sector within thirteen years on the territory of the country.

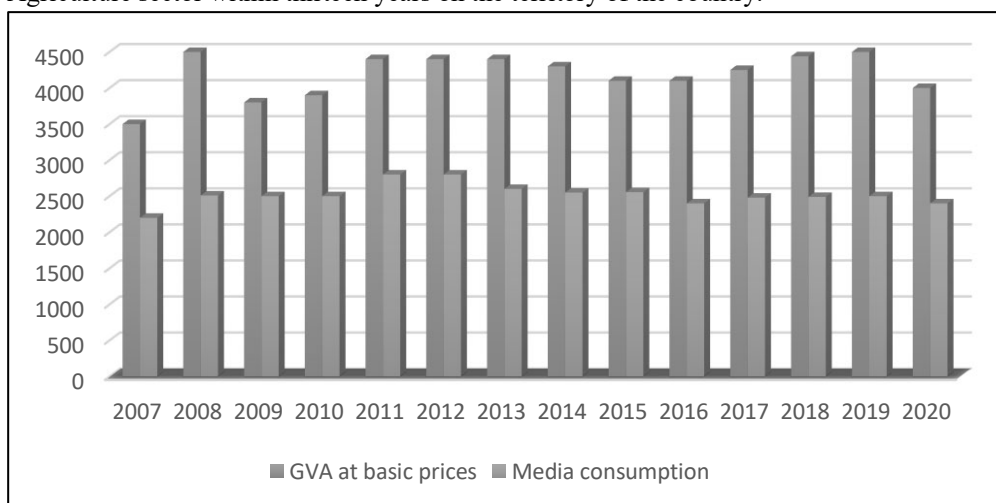


Fig. 5. Production from the agricultural sector in million BGN for Bulgaria

Source: MAFF

The trend of GVA in the Agriculture sector during the research period ranges between BGN 3 500 and 4 500 million, with the highest growth recorded in 2008 and 2019. In the period from 2011 to 2014, the trend values are relatively even and move above 4200 million BGN, and the same indicators are reported at the end of the researched period. Data show that in the first quarter of 2017, the GVA generated by the sector remained at the same level as in the period of 2016, and in the second quarter of 2017 there was a growth of 0.9% compared to the previous year.

For the 2016 campaign next year in June, the European Agricultural Guarantee Fund and the national budget have ordered BGN 1.68 billion. In 2016, the actual disbursement of RDP funds for the 2014-2020 program period [11] began. The intermediate consumption within the study, as values do not take into account significant fluctuations of the trend. In the period from 2011 to 2015, consumption reported the highest growth, the reason being the exit from the global economic crisis, the strengthening of demand and supply of agricultural products in various varieties.

The GVA at base prices appears as a balancing item, as part of the production account for the relevant activity. In this case in fig. 6 the authors for the study use the value of the basis - consumption of fixed capital (CFC) and net value added at basic prices (NVABP) for a period of thirteen years for the Agriculture sector for the country.

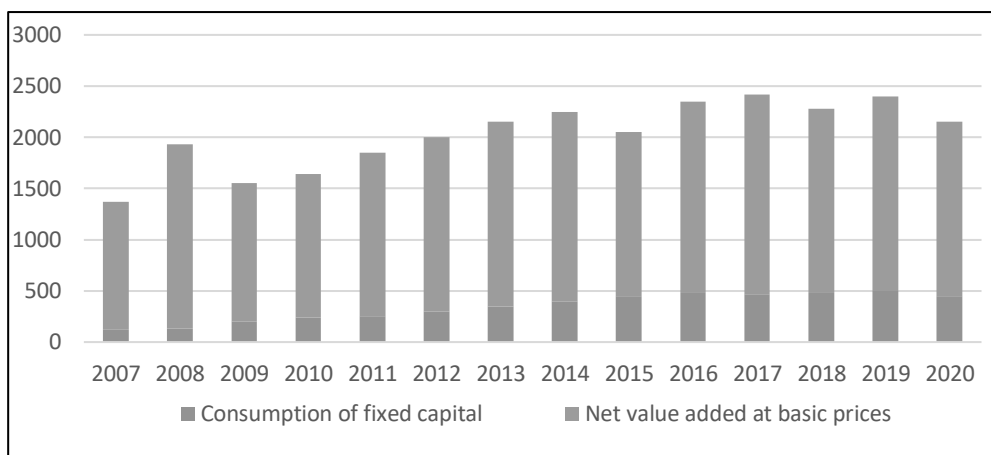


Fig. 6. GVA at base prices in million BGN for Bulgaria

Source: MAFF

The study of CFC in the publication covers the initial period of the country's accession to the EU. The values indicated in fig. 6 visualize the trend, in which there is an increase from the initial period to the end, and in the last five years the CFC reports a constant value, but not exceeding the numerical expression indicated in the figure [12]. Constant trend shows resistance in CFC, but no increase is reported, which is a logical quantity. The NVABP study is again based on the period from 2007-2020, and for this indicator presented in fig. 6 reports an upward trend from the beginning to the end period. For 2008, the values are high, due to favorable natural climatic conditions and the start of EU membership. In the following years, there is a minimal decline in the trend until 2012, due to the World Economic Crisis [13]. High values of NVABP are reported in the years from 2017 to 2019 on the basis of good agro-climatic conditions, high production yields and maximum use of European subsidies as intended.

The Agriculture sector is key for the EU and Bulgaria, as one part of the subsidies is aimed at direct payments for agricultural holdings, and another part is intended for the management of the RA and the natural resource potential. In 2019, 38.2 billion euros were spent on direct payments, and another 13.8 billion euros were spent on supporting rural municipalities, another part of the subsidies was aimed at supporting the agricultural produce market. In fig. 7, the authors visualized the subsidies for the country. aimed at non-agricultural activities over a period of thirteen years.

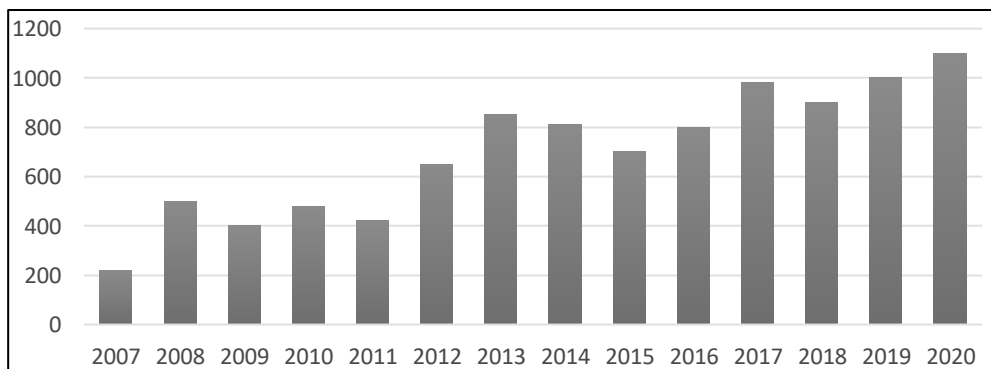


Fig. 7. Other subsidies on production in million BGN for Bulgaria 2007-2020

Source: MAFF

In fig. 7 trend of the subsidies from the initial period until 2020, increases upwards, with the highest values being reported at the end of the period. The lowest values as subsidies are reported in 2007, when the country was accepted into the EU. After this period, there was an increase in subsidies with the influx of European funds and the inclusion of Bulgaria in a number of European programs. A significant increase in subsidies is reported during the period of the last European program (ended 2014-2021) for the development of rural areas. Until the first year of the country's membership in the EU, production subsidies were at a low level, after which they increased sharply. In 2007, they were worth 250.5 million euros, which represents 7.76% of the total output of the sector. In 2020, subsidies for production are already worth 1 025.0 million euros, which is 25.85% of the value of agricultural production.

4 Conclusion

The natural and climatic features of the region are of fundamental importance for the development of agricultural holdings, which leads to an increase in the number of holdings in the rural areas of the SCR during the study period [14]. Based on IL analysis, the number of farms located in the territory of the region retain their specialization. There are objective factors influencing the economic development in the rural municipalities of the region. They should be considered separately as indicators of sustainable development. They have no exact formula or definition. Throughout the study period, the index accounts for rural specialization in farms. The increase in the number of agricultural holdings and those employed in agriculture in the rural areas of the SCR is due to the natural-climatic conditions and socio-economic activities (European programs) aimed at stimulating this sector. The region maintains its specialization and is a leader in these two activities [15]. The development of rural municipalities in the agricultural and non-agricultural sectors is based on the ongoing state policy, synchronized with European programs for the stimulation and development of smaller administrative territories through various programs based on socio-economic growth. In the coming decades, the impact of protectionist policies aimed at rural areas must be strengthened to retain young people and raise living standards. Factors of production income is largely dependent on the volume of production. The number of agricultural workers in AWU decreased by 60% from 444.4 thousand in 2007 to 179.0 thousand in 2020. Incomes by factors /1 AWU increased more than three times from BGN 2,755.7 to BGN 12,666.6 at the end of the researched period. This development is mainly due to the consolidation of farms, among producers of grain and technical crops. The development of RA on the territory of the country is directly related to the CAP of the EU, as well as the accompanying programs for the development of the same administrative structures [16].

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