




AGRARIAN

POLICY


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DEVELOPMENT TRENDS AND ANALYSIS OF STRUCTURAL SHIFTS OF RA AGRICULTURAL SECTOR¹

The dominance of the agriculture sector is due to its role in the country's food security, the rural population's income generation, and living standards. In recent years, the efficiency of the agricultural sector has noticeably decreased. The evidence of this is

¹ The article was prepared within the framework of grants of ASUE "Amberd" Research Center's research on "Evaluation of the effectiveness of state support programs in the sector of agriculture in 2010-2021".

the low labor productivity per employed person and the low level of provision of modern equipment. The study of development trends and structural shifts in the agricultural sector of the RA in 2010-2021 is especially crucial in this economically and politically particular period. The research aims to study the trend of indicators of RA agrarian sector, especially in the last decade, to reveal the factors determining the structural changes of the sector and the reasons for low economic efficiency. The analysis of the state of the agricultural sector and the given qualitative assessments characterizing the current state presented the relationship of comparable indicators. The analysis allows identifying the main problems in the agricultural sector.

Keywords: *agriculture, gross agricultural output, output plant-growing, the output of animal husbandry, agricultural lands, productivity*

JEL: O13, Q10

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Introduction. Agriculture is a system-creating branch, the development of which contributes to meeting the population's food requirements, the development of rural areas, food, light industry, production, and social infrastructures serving the sector. Along with this importance, agriculture is a high-risk sector. This is because production is organized primarily in the open air, plant growth and development are mainly determined by natural factors, and the behavior of agricultural animals is greatly influenced by the presence of natural and sown forage crops. The sector's dominance is due to its role in the country's food security, income formation, and living standards of the rural population. In particular, the agrarian sector is too important for RA economy, as the country is landlocked, the land routes of external communication are not very stable, and there are severe difficulties in filling the food shortage. In addition, more than 11.3% of GDP (in 2021)² is created in the agricultural sector, and agriculture, forestry, and fishing account for about 26% of the total employment of the republic (in 2020).³

However, our study shows that especially in 2009-2010 and after 2014, the agricultural sector's efficiency decreased significantly. This is evidenced by the low labor productivity per employee and the availability of modern equipment.

The paper aims to study the development trend of RA agrarian sector, especially in the last decade, to consider the main issues of the agricultural sector. The need to increase the efficiency of the agricultural sector is emphasized in the program of RA Government.⁴ It is considered one of the seven strategic priorities of RA agricultural sector.⁵

² RA Statistical Committee Food Security and Poverty, January-June 2022, https://www.armstat.am/file/article/f_sec_2_2022_1.pdf (accessed 05.11.2022)

³ RA Statistical Committee Statistical Yearbook of Armenia 2021, <https://www.armstat.am/file/doc/99528083.pdf> (accessed 05.11.2022)

⁴ Program of activities for 2020-2022 aimed at the implementation of the 2020-2030 strategy of the main directions ensuring the economic development of the agricultural sector of the Republic of Armenia. <https://www.arlis.am/DocumentView.aspx?DocID=137852> (accessed 05.11.2022)

⁵ Defined in the 2020-2030 strategy of the main directions ensuring the economic development of RA agricultural sector

Literature Review. Agriculture has played a crucial role in the world economy and continues to play an essential role in the development of the economy.

It is known that developing countries are much less productive in agriculture than in other sectors of the economy. Studying the statistical data of 113 developing countries, the authors of the study⁶ note that the value added per worker is, on average, four times higher in the non-agricultural sector than in the agricultural. The authors interpret this gap in agricultural productivity as a misallocation of labor, which is more common in developing economies.

The issues of the agricultural sector of the RA were studied by N. Manaseryan,⁷ A. Bayadyan,⁸ S. Avetisyan, H. Tspnetyan,⁹ A. Voskanyan,¹⁰ and other authors. The issues pointed out by them mostly coincide. In particular, S. Avetisyan singles out the issues of inefficient use of arable land and perennial plantations, the reasons for which the author emphasizes in the following order: *the small size of the economy → land fragmentation → imperfect irrigation systems → value chain problems → land degradation → population aging → migration → abandoned land.*¹¹

In essence, the transmission chain, identified by the author, reflects most of the basic issues in agriculture. In particular, the problem of the small size of farms, which, in addition to inefficient use of land, also leads to a decrease in the level of agricultural efficiency. The author sees the formation of agricultural cooperatives and the unification of small farms as one of the solutions to the mentioned issues of the agricultural sector.¹²

G.A. Melkonyan, in the article with title "Agricultural development issues in the crisis period of 2020-2021," analyzes the existing problems of the agricultural sector in the mentioned years, at the same time, highlights the positive impact of the interest rate of the loan of the subsidy program.¹³

⁶ Gollin D., Lagakos D., Waugh M.E., The Agricultural Productivity Gap in Developing Countries, Working paper International Growth Centre, 2011, p. 35, <https://assets.publishing.service.gov.uk/media/57a08ac2ed915d3cfd000912/Gollin-Et-Al-2011-Working-Paper.pdf> (accessed 05.11.2022)

⁷ Manaseryan N., The agrarian issue yesterday and today, Yerevan. "Economist" pub. house, 2005, p. 266.

⁸ Bayadyan A. H., RA agricultural production development issues and ways to solve them, Yerevan, "Science" ed. of RA National Academy of Sciences, 2013.- p. 144.

⁹ Avetisyan S., Tspnetyan, Daghunc A., Vardanyan A., Ways of Introducing the Agricultural Risk Insurance System in the Republic Of Armenia, Yerevan, "Economist" publishing house, 2017, pp. 113, https://asue.am/upload/files/amberd-economic-policy/S_Avetisyan_34.pdf (accessed 05.11.2022)

¹⁰ Voskanyan A.E., Voskanyan G.V.; The Current State of Agricultural Insurance in Armenia and Ways of Solving the Urgent Problems; AGRISCIENCE AND TECHNOLOGY, National Agrarian University of Armenia N 3 (75)/2021, p. 254-258, <https://library.anau.am/images/stories/grqer/agro-tex/2021-3/voskanyan.pdf> (accessed 05.11.2022)

¹¹ Avetisyan S., Analysis of RA agricultural land use, February, 2019. <https://asue.am/amberd/publications/analysis-of-agricultural-land-use-in-the-ra> (accessed 05.11.2022)

¹² Avetisyan S., Agricultural Cooperatives As A Rescue Circle, Amberd bulletin, Yerevan, "Economist" publishing house of ASUE, 2020/2(3), pp. 70-76, <https://asue.am/upload/files/amberd/2020.2.pdf> (accessed 05.11.2022)

¹³ Melkonyan G.A., "Agricultural development issues in the crisis period of 2020-2021. AGRISCIENCE AND TECHNOLOGY National Agrarian University of Armenia N 1 (77)/2022; pages 47-51. https://anau.am/wp-content/uploads/2022/04/journal_1-2022-2.pdf (accessed 05.11.2022)

Some agricultural sector issues are also indicated in the 2020-2030 strategy of the main directions ensuring the economic development of the agricultural sector of the RA.¹⁴ In the mentioned document, the prevalence of uncultivated land (more than a third of arable land), small plots, low levels of investment, and technical barriers are considered important agricultural sector challenges.

Based on the study of the literature related to the agricultural sector of the RA, we can state the following existing problems:

- Low efficiency of the agricultural sector,
- Low level of labor productivity in the agricultural sector,
- The fragmentation of land and the predominance of small farms, which are considered the main factor of low agricultural efficiency,
- The need to increase the country's food and food safety level,
- The problems of effective operation of the insurance system.

Research Methodology. The scientific publications of Armenian and foreign authors, statistical bulletins published by the Statistical Committee of the Republic of Armenia, informative monthly reports, yearbooks, databases, as well as the databases of the World Bank, 2020-2030 Strategy for the main directions of the economic development of the agricultural sector of the RA, the program of activities for 2020-2022, aimed at the implementation of the mentioned strategy, served as a theoretical and informative basis for the research, as well as the studies, which, in particular, included examination and analysis of policy documents, strategies, the study of relevant research, analytical materials and literature, comparison of results.

Based on the research purpose, systematic, comparative, structural analysis, combination, and dynamic research methods were used. An analysis of the situation in the agricultural sector was conducted, and qualitative assessments were given, characterizing the situation, and presenting the relationship of comparable indicators.

Using the method of descriptive statistical analysis, the evaluation, and analysis of some average and relative indicators, as well as the study of the structure of the group of indicators and structural shifts were carried out. In particular, the analyses were conducted according to agricultural lands, sown area of main agricultural crops, gross agricultural products, and yield capacity, and production indicators of main livestock products.

Analysis. As one of the essential branches of RA economy, agriculture, fishing, and forestry in 2010-2021 had an average share of 15.7% in the GDP.¹⁵ However, especially after 2016, the downward trend of this indicator was evident. In 2019 and 2020, it was also characterized by an absolute decrease (Figure 1). Before the

¹⁴ 2020-2030 strategy of the main directions ensuring the economic development of the agricultural sector of the Republic of Armenia, 2019 of the Government of the Republic of Armenia. Decision N 1886-L of December 19. <https://www.arlis.am/DocumentView.aspx?DocID=137852> (accessed 05.11.2022)

¹⁵ RA Statistical Committee, Statistical databases, GDP production, <https://www.armstat.am/am/?nid=202> (accessed 05.11.2022)

crisis years of 2009-2010, the share of agriculture in the GDP was relatively high, especially in 2000-2007, making an average of 21.6%.

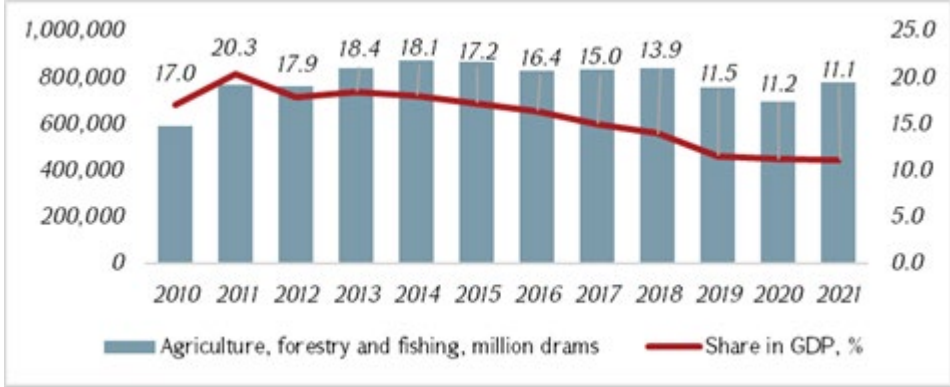


Figure 1. The dynamics in the value added of the agriculture, fishing and forestry sector¹⁶

Until 2009, agriculture, albeit with fluctuations, determined RA's economic growth to a certain extent. After the crisis, the contribution of agriculture, fishing, and forestry to economic growth began to decrease, and this trend continues to this day. In particular, from 2011-2015, the positive contribution to economic growth was 1.8 percentage points on average, while in 2016, it had a negative contribution by making 0.7 percentage points on average from 2016-2021 (Figure 2).

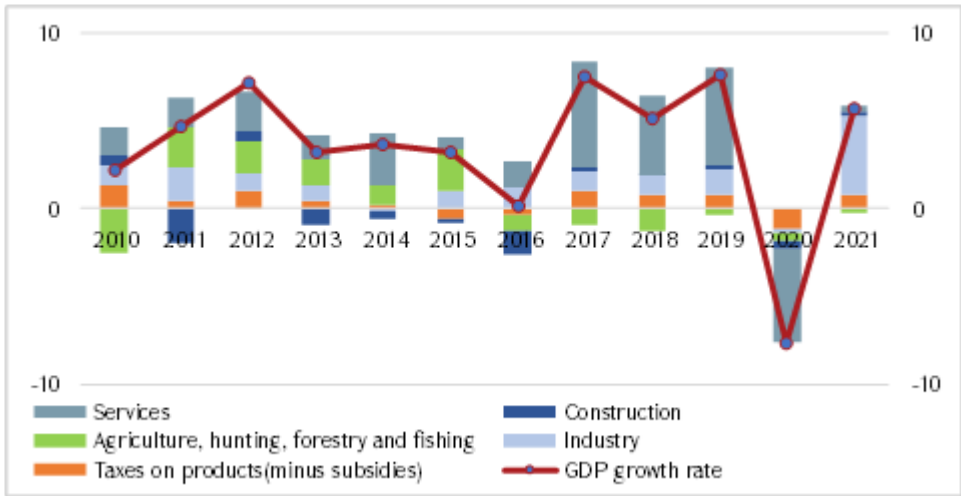


Figure 2. Contribution of sectors to GDP growth, %¹⁷

The statistical data of the World Bank document show that the weight of the RA agriculture, fishing, and forestry sector in the GDP during the considered

¹⁶ RA Statistical Committee, Statistical databases, GDP production, <https://www.armstat.am/am/?nid=202> (accessed 05.11.2022)

¹⁷ RA Statistical Committee, Statistical databases, GDP production, <https://www.armstat.am/am/?nid=202> (accessed 05.11.2022)

period was twice or three times greater than the corresponding index of the countries with a higher average income. According to this indicator, Armenia was closer to the indicator of EAEU member Kyrgyzstan - 14.3%. Meanwhile, it was 3.5% in Russia, 7.3% - in Belarus, 4.6% - in Kazakhstan, 7.6% - in Georgia, 5.6% - in Azerbaijan, and 7.0% - in Turkey (Figure 3).

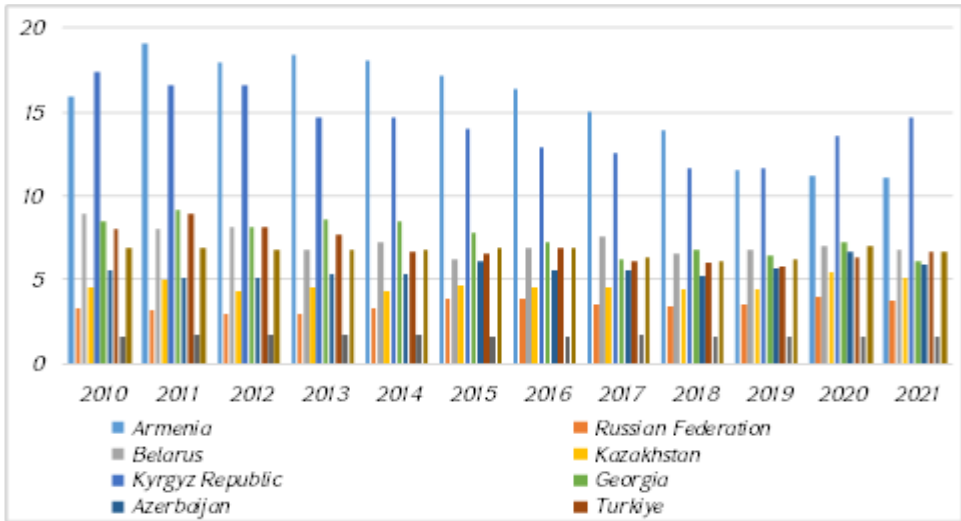


Figure 3. The share of value added of agriculture, forestry and fishing in GDP, %¹⁸

Now, let us present in more detail the development trends of RA agricultural branch in 2010-2021. From the data in Figure 4, it can be seen that the gross agricultural output of the RA in 2010-2014 steadily increased, then until 2020 mainly showed a downward trend.

The gross product of agriculture in 2021 amounted to 933 billion AMD, 50.3% of which (469.4 billion AMD) was formed from crop production and 49.7% (463.6 billion AMD) from livestock production.

The gross product of the agricultural sector in 2017-2020 had a significant decline. In 2020, the decline compared to 2017 was almost 8.3%, and in 2021 compared to the previous year, it increased by almost 12%.

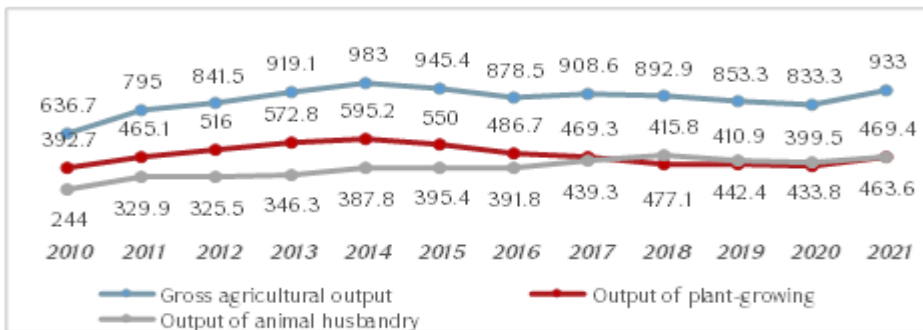


Figure 4. Gross agricultural, plant growing and animal husbandry output, bln. drams¹⁹

¹⁸ The World Bank, Data, <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS> (accessed 05.11.2022)

In the structure of the gross agricultural product of the RA, plant-growing dominates, except in 2018-2020. In the structure of agriculture in 2010-2020, the weight of plant-growing was on average 55.7%, and animal husbandry - 44.3%. The branch structure of agriculture is currently (2021) as follows: Plant-growing - 50.3%, animal husbandry -49.7%, in 2010 against 61.7 and 38.3%, respectively.

The 2010-2014 gross output of the horticulture sub-sector has shown a constant growth trend but has decreased since 2015. Moreover, the sub-branch of animal husbandry has generally had a growth trend.

In the first quarter of 2022, the gross output of agriculture amounted to 79.1 billion drams, decreasing by 5.4% compared to the corresponding period of the previous year and increasing by 22.9% compared to the fourth quarter of the previous year. In the second quarter, the gross product increased by 300.6% compared to the first quarter, making 212.8 billion drams. In general, in the months of January-June 2022, the gross output of crop and animal husbandry decreased by 8.8% and 3%, respectively, compared to the corresponding period of the previous year.²⁰

Along with the decline in the gross output of agriculture, there is also a decrease in the number of harvested crops. The reduction of their sown areas also accompanies the fall in the gross yield of agricultural crops.

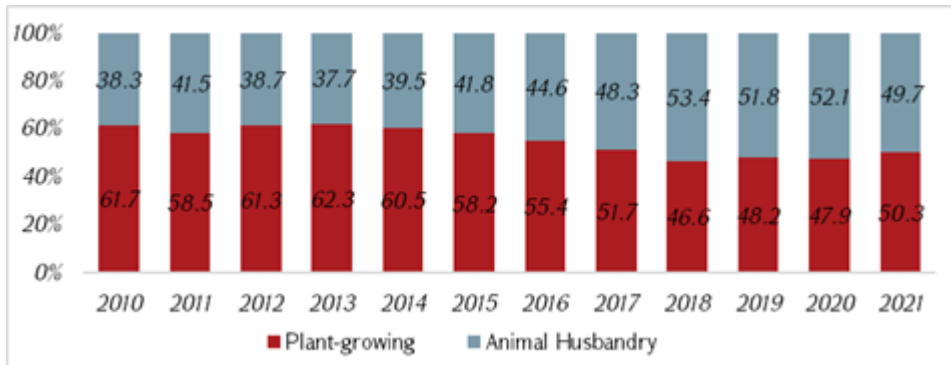


Figure 5. The structure of gross agricultural output in 2010-2021, %²¹

¹⁹ RA Statistical Committee, Statistical Yearbook of Armenia 2015, p. 290, <https://armstat.am/file/doc/99493653.pdf> (accessed: 05.11.2022)

RA Statistical Committee, Statistical Yearbook of Armenia 2019, p. 318, <https://armstat.am/file/doc/99516793.pdf> (accessed: 05.11.2022)

RA Statistical Committee, Statistical Yearbook of Armenia 2021, p. 351, <https://www.armstat.am/file/doc/99526883.pdf> (accessed: 05.11.2022)

RA Statistical Committee, Socio-economic situation of the RA in January-December 2021, p. 23, https://armstat.am/file/article/sv_12_21a_122.pdf (accessed: 05.11.2022)

²⁰ RA Statistical Committee, Socio-economic situation of the RA, January-June 2022, p. 21

²¹ RA Statistical Committee, Statistical Yearbook of Armenia 2015, p. 290, <https://armstat.am/file/doc/99493653.pdf> (accessed: 05.11.2022)

RA Statistical Committee, Statistical Yearbook of Armenia 2019, p. 318, <https://armstat.am/file/doc/99516793.pdf> (accessed: 05.11.2022)

RA Statistical Committee, Statistical Yearbook of Armenia 2021, p. 351, <https://www.armstat.am/file/doc/99526883.pdf> (accessed: 05.11.2022)

RA Statistical Committee, Socio-economic situation of the RA in January-December 2021, p. 23, https://armstat.am/file/article/sv_12_21a_122.pdf (accessed: 05.11.2022)

Let us mention that from 2010-2016 the area of sown areas in the RA increased, after which it sharply decreased. At the same time, the main agricultural crops showed the same trend: along with the increase in the sown areas, the total harvest of grain and leguminous plants also increased and then decreased accordingly.²²

The usage of arable land is an important indicator characterizing the level of agricultural development. In this case, we mean only the intended use of arable land, that is the cultivation of agricultural crops (Table 1). Moreover, in general, the economic efficiency of arable land usage is determined by several important indicators, such as gross and product output per unit area, net income, the yield of main agricultural crops, etc.

Table 1

The level of intended usage of RA arable land in 2010-2021²³

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Arable land, 1000 ha	448.5	449.2	448.4	448.2	447.0	446.7	446.4	446.0	445.6	444.0	444.0	444.0
Sown area, 1000 ha	283.6	286.7	304.2	318.1	324.2	337.5	353.4	294.5	242.3	227.9	222.7	227.2
The level of arable land use, %	63.2	63.8	67.8	71.0	72.5	75.6	79.2	66.0	54.4	51.3	50.1	51.2

The calculations based on the data in Table 1 show that in 2010-2021 on average only 63.9% of the available arable land was planted (total sowing 3427.3 thousand ha/ total arable land 5360 thousand ha x 100%). For a republic with scarce land like Armenia, this is a very low indicator, which does not meet the population's food self-sufficiency requirements.

The analysis of agricultural crop yield indicators shows that except for fruit and grapes, the yield of other crops decreased during the study period. ***Of course, in 2013-2016, the basis of stable high yields, sowing area, and therefore gross harvest indicators is the result of sowing area and yield extra additions within the "cooperation" of the Ministry of Agriculture-regional administrations-municipalities governorates. In return, the communities were provided with additional amounts of subsidized seeds, fertilizers, and diesel fuel. This caused such changes in data dynamics. The***

²² RA Statistical Committee, Statistical Yearbook of Armenia 2015, pp. 293, 300,

<https://armstat.am/file/doc/99493653.pdf> (accessed: 05.11.2022)

Statistical Yearbook of Armenia 2019, pp. 320,328, <https://armstat.am/file/doc/99516793.pdf> (accessed: 05.11.2022)

Statistical Yearbook of Armenia 2021, pp. 353, 362, <https://www.armstat.am/file/doc/99526883.pdf> (accessed: 05.11.2022)

RA Statistical Committee, Sown Areas of Agricultural Crops, Planting Area of Permanent Crops, Gross Harvest and Average Crop Capacity for 2021 (Statistical bulletin),

<https://armstat.am/am/?nid=80&id=2467> (accessed: 05.11.2022)

²³ The table was compiled by the authors of the statistical yearbook of Armenia 2010-2020 and based on the data of the relevant years of the publication of the Statistical Committee of the Republic of Armenia "Sowing areas of agricultural crops, planting areas of permanent crops, gross harvest and average crop capacity."

other reason for the decline since 2017 can be the problems related to adjusted data provided by annual state statistical reports.²⁴ It was considered that after the data adjustment, we should expect an increase, but we still do not have it.

Table 2

Yield capacity of main agricultural crops, 2010-2021, centners 1 ha²⁵

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Grains and leguminous plants	20.7	27.9	26.5	30.8	31.8	31.3	30.7	19.8	26.1	16.9	20.5	12.9
Potatoes	170.1	194.3	206.7	214.3	231.6	217.8	209.8	214.9	187.3	199.2	212.8	179.3
Vegetable	294.2	306.7	325.0	333.7	350.5	334.0	301.8	286.3	258.6	265.0	280.8	271.8
Melon crops	296.0	313.8	399.9	388.5	421.4	423.4	325.1	316.8	276.3	300.6	317.1	291.6
Fruit and berries	39.2	73.5	97.0	95.0	80.8	103.0	66.1	93.5	87.7	76.2	71.4	82.5
Grape	151.5	158.0	151.3	149.8	157.7	188.2	110.0	141.4	120.1	146.1	189.3	157.9

Another important sub-sector of agriculture, animal husbandry, also experienced some development during the study period. Thus, according to the data in Table 3, the number of cattle in 2010-2016 constantly increased, and in 2016 in 2010 it increased by 22.9%. At the same time, the number of cows increased by 16.3%, sheep and goats - by 52.2%, pigs - by 55.2%, and horses by - 5.6%. The number of birds, except for 2016 and 2017, increased in other years.

After 2016, there was a decrease in livestock. Thus, in 2021, compared to 2016, the number of cows decreased by 16.6%, and the number of small cattle (sheep and goats) decreased by 7.7%.

Along with the decrease in the number of livestock, the production of milk and wool, and the sale of farm animals and birds also decreased. According to the statistical indicators of production in the RA livestock products in 2010-2021, milk production until 2017 has increased, which can be attributed to the increase in the number of cows, as well as in the milk yield of animals.²⁶

²⁴ RA Statistical Committee, Socio-economic situation of the RA, January-December 2017, p. 18, https://armstat.am/file/article/sv_12_17a_122.pdf (accessed: 05.11.2022).

²⁵ RA Statistical Committee, Statistical Yearbook of Armenia 2015, pp. 298-301,

<https://armstat.am/file/doc/99493653.pdf> (accessed: 05.11.2022)

Statistical Yearbook of Armenia 2019, pp. 325-328, <https://armstat.am/file/doc/99516793.pdf> (accessed: 05.11.2022)

Statistical Yearbook of Armenia 2021, pp. 359-362, <https://www.armstat.am/file/doc/99526883.pdf> (accessed: 05.11.2022)

RA Statistical Committee, Sown Areas of Agricultural Crops, Planting Area of Permanent Crops, Gross Harvest and Average Crop Capacity for 2021 (Statistical bulletin),

<https://armstat.am/am/?nid=80&id=2467> (accessed: 05.11.2022)

²⁶ RA Statistical Committee, Databases.

https://statbank.armstat.am/pxweb/hy/ArmStatBank/ArmStatBank__6%20Agriculture,%20forestry%20and%20fishing/AF-1-2020.px/?rxid=9ba7b0d1-2ff8-40fa-a309-fae01ea885bb (accessed: 05.11.2022)

Table 3

Number of livestock and poultry, 2010-2021, 1000 heads²⁷

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Cattle	570.6	571.4	599.2	661	677.6	688.6	701.5	655.8	590.6	571.9	579.3	613.4
including cows	273.9	272.6	283.3	303.3	309.6	313.9	318.6	296	266.8	254	251.7	265.8
Sheep and goats	511	532.3	590.2	674.7	717.6	745.8	778.1	727.1	660.1	638.3	662.5	717.8
Pigs	112.6	114.8	108.1	145	139.8	142.4	174.8	175.5	166.8	197.9	223.3	200.2
Horses	10.8	10.1	9.9	10.8	11.7	11.4	11.4	10.6	10	10.7	11.4	13.1
Poultry	4134.6	3642.5	4023.5	4050	4101.2	4145.5	3942.8	3814.2	4406.4	4152.1	4396.3	4203.8

2018-2021 Gegharkunik, Shirak, Lori and Aragatsotn marzes are leading in terms of milk production. In the same period, Gegharkunik and Shirak marzes are leading in terms of livestock and poultry production for slaughter. As for the volumes of egg production, Armavir and Kotayk marzes are leading here.

Table 4

Production of main animal husbandry products by marzes²⁸

	Realized livestock and poultry for slaughter (live weight), 1000 tonnes				Milk (1000 tonnes)				Eggs (mln. pieces)			
	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021
<i>Yerevan city</i>	5.3	4.4	4.6	4.5	2.7	2.4	1.8	1.9	8.1	7.4	8.6	8.3
<i>Aragatsotn</i>	19.1	19.9	20.4	19.9	81.7	80.9	76.3	78.8	83.9	76.4	81.0	73.4
<i>Ararat</i>	13.4	13.4	13.3	13.9	41.1	40.0	37.5	39.1	64.3	59.5	64.3	64.1
<i>Armavir</i>	20.6	21.6	20.7	20.8	46.3	39.6	39.7	40.9	158.9	175.5	178.6	159.9
<i>Gegharkunik</i>	29.8	28.9	27.8	28.8	125.6	122.4	114.4	117.7	64.1	55.7	58.5	58.0
<i>Lori</i>	20.8	20.3	20.9	23.7	84.9	82.1	83.4	85.9	51.0	47.9	44.3	45.5
<i>Kotayk</i>	19.8	20.5	22.0	20.5	69.1	67.2	67.6	68.3	125.1	135.9	171.6	156.8
<i>Shirak</i>	24.9	24.7	24.7	25.2	110.7	101.1	100.2	102.7	45.5	45.6	42.8	38.4
<i>Syunik</i>	20.4	19.0	18.9	19.1	71.0	68.9	69.0	68.5	44.8	40.1	37.7	34.4
<i>Vayots dzor</i>	5.8	5.8	5.9	6.2	24.5	23.9	23.7	24.7	30.3	28.4	20.9	19.7
<i>Tavush</i>	10.4	10.2	10.4	10.5	40.1	39.4	40.7	42.1	50.8	48.2	46.3	43.4

No significant changes are observed in the indicators of food yield of agricultural animals during the period under study. The average milk yield of one cow in 2010-2020 was 2175.5 kg, the average wool yield of one sheep was 2.2 kg, and the average annual egg yield was 240.3 pieces.²⁹

²⁷ RA Statistical Committee, Statistical Yearbook of Armenia 2015, pp. 303-305, <https://armstat.am/file/doc/99493653.pdf> (accessed: 05.11.2022)

RA Statistical Committee, Statistical Yearbook of Armenia 2019, pp. 329-332, <https://armstat.am/file/doc/99516793.pdf> (accessed: 05.11.2022)

RA Statistical Committee, Statistical Yearbook of Armenia 2021, pp. 363-366, <https://www.armstat.am/file/doc/99526883.pdf> (accessed: 05.11.2022)

RA Statistical Committee, *Sowing areas of agricultural crops, areas of perennial plantations, gross harvest, and average yield in 2021*. <https://armstat.am/am/?nid=80&id=2467> (accessed: 05.11.2022)

²⁸ RA Statistical Committee, Databases, https://statbank.armstat.am/pxweb/hy/ArmStatBank/ArmStatBank_6%20Agriculture,%20forestry%20and%20fishing/AF-1-2020.px?rxid=9ba7b0d1-2ff8-40fa-a309-fae01ea885bb (accessed: 05.11.2022)

²⁹ RA Statistical Committee, Statistical Yearbook of Armenia 2015, p. 305, <https://armstat.am/file/doc/99493653.pdf> (accessed: 05.11.2022)

The productivity of one employed person is an important indicator characterizing the agricultural sector's efficiency. As shown in Figure 6, the agricultural sector of the RA is the lowest productive sector in the considered period. Meanwhile, the service sector's productivity is almost two times higher than that of the agricultural sector. Moreover, the industry's productivity is 2-3 times, and in 2020, it is about 5.5 times higher than the productivity of agriculture. In 2020, a sharp increase in the industry's productivity was due to the significant increase in the added value created due to the extraction of metal ore.

By the way, in 2020, compared to 2010, the annual productivity of 1 person employed in agriculture increased 2.3 times, making 3019.1 million drams. The increase in productivity of the branch is due to a sharp increase in added value (1.2 times), which, in turn, is due to an increase in the gross output created in the sub-branch of crop production. The increase in productivity, on the other hand, is caused by the decrease in the number of people employed in the branch about 2 times.

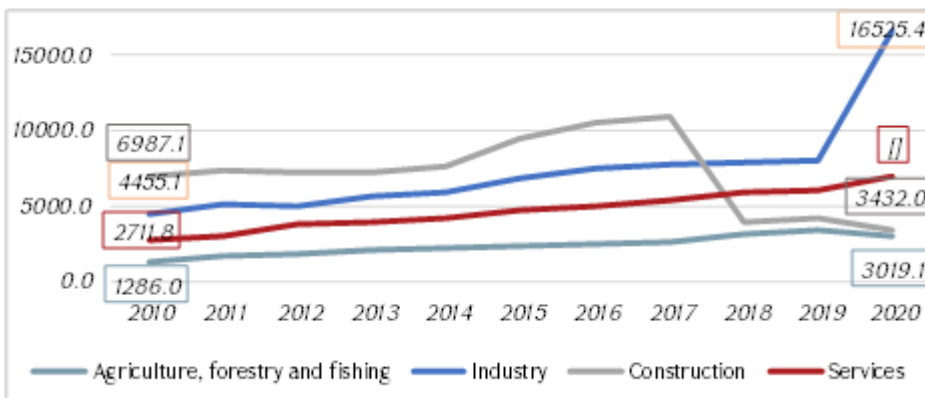


Figure 6. Labor productivity (value added per worker) by economic sector, mln dram³⁰

The relevant statistical data of the World Bank proves that RA indicator of productivity per employee during the considered period generally corresponded to the corresponding indicator of countries with a high average income, twice exceeded the corresponding indicator of Georgia, Azerbaijan, and Kyrgyzstan, but was twice or three times inferior to that of the Russian Federation. and the index of Turkey.

³⁰ RA Statistical Committee, Statistical Yearbook of Armenia 2015, pp. 61-62.

<https://armstat.am/file/doc/99493603.pdf> (accessed: 05.11.2022)

RA Statistical Committee, Statistical Yearbook of Armenia 2015, pp. 67-68.

<https://armstat.am/file/doc/99510748.pdf> (accessed: 05.11.2022)

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RA Statistical Committee, Statistical databases, GDP production.

<https://www.armstat.am/am/?nid=202> (accessed: 05.11.2022)

The calculation was carried out by the authors, the corresponding indicator of 2021 was not presented due to the lack of the number of employed people by type of economic activity.

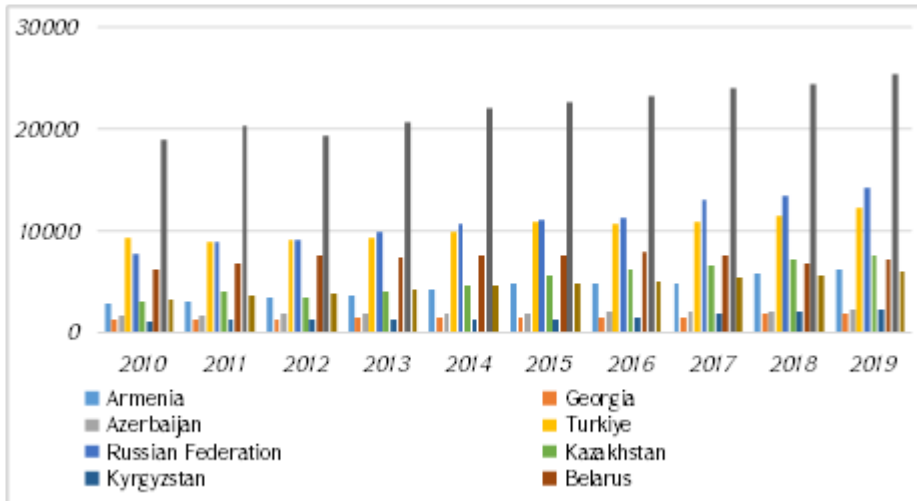


Figure 7. *The value added per worker in agriculture, forestry and fishing, in USD³¹*

In the structure of employment in the RA, those employed in the agricultural sector predominate after the service sector. However, the large number of people employed in this sector and the low productivity of work indicate the introduction of insufficiently intensive technologies in the agricultural sector.

A high level of informal employment has historically distinguished the agricultural sector of the RA. In particular, if in 2021 the total level of informal employment in the RA was 35.2%, then in the agricultural sector it was 95.6%, while the indicator in the non-agricultural sector was 18.1%.³² The high level of informal employment proves that the sector in the RA is represented in unregistered organizations, production cooperatives, or in the form of workers in households (salaried or free) or self-employed. In this case, it is logical that the scope of spreading innovation in the agricultural sector of the RA is limited. The products of the vast majority of those employed in the sector are intended exclusively for final consumption, the products do not enter the market, and there is no competition. Therefore, innovation has a narrow scope of diffusion, mainly limited to the business sphere. Nevertheless, we should note that the share of commercial organizations' agricultural products in the total product has almost doubled. If in 2010, the share was 3%, then in 2020 it reached 5.9%. This is

³¹ The World Bank, Data, <https://data.worldbank.org/indicator/NV.AGR.EMPL.KD> (accessed: 05.11.2022)

³² RA Statistical Committee, Yerevan city of the RA in Figures, Yerevan, 2021, p. 55
 RA Statistical Committee, Kotayk Marz of the RA in Figures, Yerevan, 2021, p. 50
 RA Statistical Committee, Aragatsotn Marz of the RA in Figures, Yerevan, 2021, p. 58
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 RA Statistical Committee, Vayots dzor Marz of the RA in Figures, Yerevan, 2021, p. 51
 RA Statistical Committee, Tavush Marz of the RA in Figures, Yerevan, 2021, p. 56

because, starting in 2017, the production volumes of household's plots have continuously decreased, while the commercial ones have increased sharply. It is also important to note that in 2010-2020 the share of agricultural family farms was on average 96.2%, and 3.8% was the share of agricultural commercial organizations. At the same time, the majority of products produced by commercial organizations are animal husbandry.

Table 5

Gross agricultural output, total sown area, and productivity by farms³³

	Household's plots				
	2016	2017	2018	2019	2020
Gross agricultural output, (at current prices, bln. drams)	850.8	876.5	847.7	800.6	783.8
Sown areas under agricultural crops (1000 ha)	350.3	291.9	239.1	224.8	219.5
Productivity (bln. drams/1000 ha)	2.43	3.00	3.55	3.56	3.57
	Commercial organizations				
Gross agricultural output, (at current prices, bln. drams)	27.7	32.1	45.2	52.7	49.5
Sown areas under agricultural crops (1000 ha)	3.1	2.6	3.2	3.1	3.2
Productivity (bln. drams/1000 ha)	8.94	12.35	14.13	17.00	15.47

As for productivity, household plots are significantly inferior to commercial organizations. It is worth emphasizing that the gap between the productivity of the two sectors has been increasing in recent years. In particular, if in 2016 their ratio was 3.68, then by 2020 it has reached 4.33. This is because the indicator remained almost the same in households and almost doubled in commercial organizations.

This is a clear signal that it is necessary to democratize the spread of innovation within the framework of population economies, making it available to as many subjects as possible. One of the solutions, for example, is the establishment of innovation hubs dealing with disseminating innovative technologies in the agricultural communities in the regions of the RA. Their overarching goal should be, first of all, to increase the level of interest among young people and to replace ineffective traditional methods with new ones. Moreover, marzes and communities with a high level of informal employment in the agricultural sector should be selected as targets.

One of the branch problems is that Armenia's agricultural sector lacks innovation and young people's involvement. A clear example of what has been said is the number of students enrolled in the programs offered by higher education institutions.³⁴ It has not been a large number for years. Moreover, in the last four years, their number and share among the total number of students have decreased about three times.³⁵

³³ RA Statistical Committee, Statistical Yearbook of Armenia 2021, p 350-353. <https://www.armstat.am/file/doc/99526883.pdf> (accessed: 05.11.2022)

³⁴ Statistical Committee of RA, Statistical Yearbook of Armenia 2021, pp. 165-166, <https://armstat.am/file/doc/99526838.pdf> (accessed: 05.11.2022)

³⁵ Statistical Committee of RA, Statistical Yearbook of Armenia 2021, p. 168, <https://armstat.am/file/doc/99526838.pdf> (accessed: 05.11.2022)

This has a direct impact on the development of the startup ecosystem in the Armenian agricultural sector. As a result, it is extremely small, and naturally, the number of successful companies is also not significant.

Conclusions. Pointing out the existing problems in the RA agricultural sector and observing the trend of statistical indicators, we discovered that in the agricultural sector in 2010-2021 a continuous decline was registered during the gross output decrease, including the gross output of the crop and livestock sub-sectors. Along with the decline in the gross output of agriculture, there is also a decrease in the number of harvested crops. The reduction of agricultural crops sown areas also accompanied the decline in its gross yield, and the yield of agricultural crops was in line with the dynamics of the sown areas and gross harvest. In 2010-2021, the change in the number of farm animals, in turn, determined the change in milk and wool production and the sale of livestock and poultry.

The indicators characterizing efficiency remain problematic for RA agriculture: the levels of crop yield, food yield of farm animals, and productivity of one person employed in agriculture. In terms of increasing the levels of these indicators, the technical support of agricultural holdings is essential. Meanwhile, the agricultural machinery and machines currently available in the RA are characterized by low efficiency, cost-effectiveness, high wear and tear, low equipment level, and additional repair costs.

Related to the involvement of youth in agriculture, we suggest developing a platform about the agricultural sector which will include trends in the sector, government support programs, various calculators, and financial resources. It can later be turned into a marketplace application, where young people can find consumers or suppliers, use financial services: lending, insurance, leasing or renting, and automated implementation of tax reports.

In order to develop a startup ecosystem in agriculture, it is also recommended to provide grants with state support and implement incubation programs for young people. The overarching goal of the ecosystem is not to create the next unicorn but to engage or educate young people in entrepreneurship in the agricultural sector. There is also a need to implement awareness courses about innovations, modern technologies, equipment, and materials used in the rural sector.

However, it is necessary to emphasize the importance of the agricultural sector for RA economy because, in the constantly changing geopolitical situation, it is important to ensure access to food and food security, the main guarantee of which is the agricultural sector, unlike other sectors of the economy. Indeed, the sector's development is still heavily influenced by natural disasters and climate change, the imperfection of mechanisms to eliminate their consequences, and the problems of technical saturation, productivity, and efficiency. However, this is where the implementation of effective state support programs, aimed at managing the mentioned risks, are important.

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ՍԱՄՎԵԼ ԱՎԵՏԻՍՅԱՆ

ՀՊՏՀ «Ամբերդ» հեղափոխական կենտրոնի ավագ փորձագետ,
 փնտրեսագիտության դոկտոր, պրոֆեսոր

ԳԱՅԱՆԵ ԱՎԱԳՅԱՆ

ՀՊՏՀ մակրոէկոնոմիկայի ամբիոնի դոցենտ,
 փնտրեսագիտության թեկնածու

ԽՈՐԵՆ ՄԽԻԹԱՐՅԱՆ

ՀՊՏՀ կառավարման ամբիոնի դոցենտ,
 փնտրեսագիտության թեկնածու

ԱԻԴԱ ՄԻՐՈՒՄՅԱՆ

ՀՊՏՀ մակրոէկոնոմիկայի ամբիոնի ասպիրանտ

ՍՈՒՐԵՆ ԿԱՐԱՊԵՏՅԱՆ

ՀՊՏՀ «Մակրոփնտրեսական վերլուծություն»
 կրթական ծրագրի մագիստրանտ

ՀՀ գյուղատնտեսության ոլորտի զարգացման միտումները և կառուցվածքային տեղաշարժերի վերլուծությունը.

Գյուղատնտեսության ոլորտի գերակայությունը պայմանավորված է երկրի պարենային անվտանգության, գյուղական բնակչության եկամուտների ձևավորման ու կենսամակարդակի գործում ունեցած դերակատարությամբ: Վերջին տարիներին գյուղատնտեսության բնագավառի արդյունավետությունը նկատելիորեն պակասել է: Դրա վկայությունն է մեկ զբաղվածի հաշվով աշխատանքի ցածր արտադրողականությունը և ժամանակակից տեխնիկայով ապահովվածության ցածր մակարդակը: 2010–2021 թթ. ՀՀ գյուղատնտեսության ոլորտի զարգացման միտումների և կառուցվածքային տեղաշարժերի ուսումնասիրությունը հատկապես կարևորվում է տնտեսական և քաղաքական առումով առանձնահատուկ այս ժամանակահատվածում: Հոդվածի նպատակն է ուսումնասիրել վերջին տասնամյակում ՀՀ ագրարային ոլորտի ցուցանիշների շարժընթացը, բացահայտել ճյուղի կառուցվածքային փոփոխությունները պայմանավորող գործոնները և ցածր տնտեսական արդյունավետության պատճառները: Կատարվել է գյուղատնտեսության բնագավառի վիճակի վերլուծություն, տրվել են ներկա իրադրությունը բնութագրող որակական գնահատականներ՝ ներկայացնելով համադրելի ցուցանիշների կապը: Սա հնարավորություն է ընձեռել բացահայտելու գյուղատնտեսության ճյուղի հիմնական խնդիրները:

Հիմնաբառեր. գյուղատնտեսություն, գյուղատնտեսության համախառն արտադրանք, բուսաբուծության արտադրանք, անասնաբուծության արտադրանք, գյուղատնտեսական նշանակության հողեր, արտադրողականություն

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***Тенденции развития и анализ структурных сдвигов
в сельскохозяйственном секторе РА.***

Доминирование сельскохозяйственного сектора обусловлено его ролью в обеспечении продовольственной безопасности страны, формировании доходов и уровня жизни сельского населения. В последние годы эффективность аграрного сектора заметно снизилась. Об этом свидетельствует низкая производительность труда в расчете на одного занятого и низкий уровень обеспеченности современным оборудованием. Изучение тенденций развития и структурных сдвигов сельскохозяйственного сектора РА в 2010-2021 гг. считается крайне важным в этот особый в экономическом и политическом плане период.

Цель статьи - изучить динамику показателей аграрного сектора РА, особенно в последнее десятилетие, выявить факторы, определяющие структурные изменения отрасли и причины низкой экономической эффективности. Проведен анализ состояния аграрного сектора, даны качественные оценки, характеризующие текущее состояние, представляющие взаимосвязь сопоставимых показателей. Все перечисленное предоставило возможность выявить основные проблемы аграрного сектора.

Ключевые слова: *сельское хозяйство, валовая продукция сельского хозяйства, продукция растениеводства, продукция животноводства, земли сельскохозяйственного значения, производительность*

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