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FIXED ASSETS AS AN ELEMENT OF THE PRODUCTION POTENTIAL OF THE AGRICULTURAL SECTOR IN REGIONS

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Abstract

The purpose of the study is to assess the current state of fixed assets of the agricultural sector in the Penza region and their use. The information resources were the results of scientific research by leading scientists in the field of the use of fixed assets, as well as data generated by the authors on the basis of official statistical materials for the Penza region. For analytical data processing, methods of scientific generalization, systematization and statistical groupings were used. In the course of the current research, indicators of the provision of agricultural organizations with fixed assets were calculated and systematized, and trends in their change were determined. For the period from 2014 to 2020, the indicators of capital ratio and capital-labor ratio of agricultural organizations in the region increased by more than 4 times. In order to identify the influence of factors on the capital ratio per 100 hectares of agricultural land, 125 agricultural organizations of the Penza region were examined and grouped. In the group with the highest capital ratio (5 million rubles or more of fixed assets per 100 hectares of agricultural land), the maximum return on fixed assets is 5.5% and the profitability of production is 17.9%. The article identifies strengths and weaknesses in the use of fixed assets, opportunities and threats. Opportunities to improve the efficiency of the use of fixed assets by agricultural organizations of the Penza region can be achieved through the technical improvement of machinery and equipment, production technologies; focus on the high technical level of fixed production assets; fuller use of available fixed assets.

Key words**:** *production potential, fixed assets, capital ratio, efficiency*

INTRODUCTION

The problem of efficient use of the production potential of the agricultural sector of the economy is currently the most important part of the country's economic development strategy [2].

In the scientific papers under the term "potential" refers to the ability to produce a certain volume of products over a period of time, subject to the full use of available land, material and technical, labor, biological and financial resources. The development of the agricultural sector is defined by a combination of the main factors used in production, on which the quantity and scale of crop and livestock production, which are the main sectors of the agricultural sector, depend to a certain extent. The main factors of production in the agricultural sector are: land, labor, animals and plants, material and technical base, organizational and managerial activity of business leaders [1, 10].

The effective use of the production potential of agriculture in the region and organizations provides for the rational use of resources included in its composition [5].

The effectiveness of the production potential of participants in the agricultural business depends on the effectiveness of the use of its constituent elements. In conditions of limited available resources, economic entities are faced with the need to improve the efficiency of the use of production potential. To a greater extent, this applies to the fixed assets of organizations that require significant investments in their renewal and maintenance. Fixed assets are the most significant element of the production potential of economic entities, providing the material and technical base and conditions for production activities. The most complete and rational use of fixed assets contributes to the improvement of all technical, economic and financial performance indicators of agricultural organizations and the agricultural sector of the

region as a whole. The current importance of the identified problem proves the necessity to assess the current state of fixed assets of the agricultural sector of the Penza region and their rational use. In the current research, indicators of the effectiveness of the use of fixed assets were calculated and systematized, trends in their change and renewal were identified, strengths and weaknesses in the use of fixed assets, opportunities and threats were identified. Based on the results of the research, recommendations were developed to improve the efficiency of the use of fixed assets in the agricultural sector of the regions.
The purpose of the study is to assess the current state of fixed assets of the agricultural sector in the Penza region and their use.

MATERIALS AND METHODS

For a detailed study of the identified problem, the performance indicators of agricultural organizations of the Penza region for the period from 2012 to 2020 were used.
Within the current research the main emphasis was placed on the analysis of the provision indicators of agricultural organizations in the Penza region with fixed assets (capital and capital-labor ratio). The capital ratio is calculated as the ratio of the average annual value of fixed assets to the area of agricultural land, multiplied by 100. This indicator characterizes the size of fixed assets in value terms per 100 hectares of agricultural land.
The capital-labor ratio characterizes the provision of labor resources with fixed assets and is calculated as the ratio of the average annual cost of fixed assets to the average annual number of employees.
The theoretical and methodological basis of the study was the works of the classics of agrarian economics, the work of modern domestic and foreign economists.
When writing the article, data from the Territorial Authority of the Federal State Statistics Service for the Penza Region, the Ministry of Agriculture of the Penza Region were used.
The research was carried out using general scientific methods (dialectical, analysis and synthesis, comparison and analogy), as well as special methods of economic science (system analysis, comparative analysis, economic and mathematical methods).

RESULTS AND DISCUSSIONS

Fixed assets are one of the most essential elements of the production potential, as they together provide the material and technical base and conditions for production activities. The fixed assets of the agrarian sector are the basis of the country's food security [9]. The most complete and rational use of fixed assets makes it possible to increase labor productivity, increase production volumes, improve product quality and, ultimately, contribute to the improvement of all technical, economic and financial performance indicators of agricultural organizations.
In the process of research, it is important to assess the availability, condition and degree of use of fixed assets that form a significant part of the production potential of enterprises in the agricultural sector of the economy.
The Penza Region is located in the center of the European part of Russia and is part of the Volga Federal District. Agriculture plays a special role in the region's economy. This sector of the economy accounts for about 15% of the gross regional product.
In the period from 2012 to 2020, there was a trend of active development of agriculture in the Penza region. In 2020, compared to 2011, the production volumes of this industry increased by 72.9%, including crop production by 89.0%, livestock products - by 58.4%.
In 2020, the region produced agricultural products in actual prices in the amount of 129.1 billion rubles, including crop production - 73.8 billion rubles, livestock products - 55.3 billion rubles. In a comparable assessment, the increase compared to 2019 was 14.4%.
The volume of agricultural production and the value of the result indicators of agricultural organizations depends on the extent to which the main production assets are involved in the production process, how agricultural organizations are provided with them, what is the structure of the main production assets [3].
An important factor in the growth of the

efficiency of the agrarian sector of the region is the growth of capital ratio and capital-labor ratio (Figure 1).

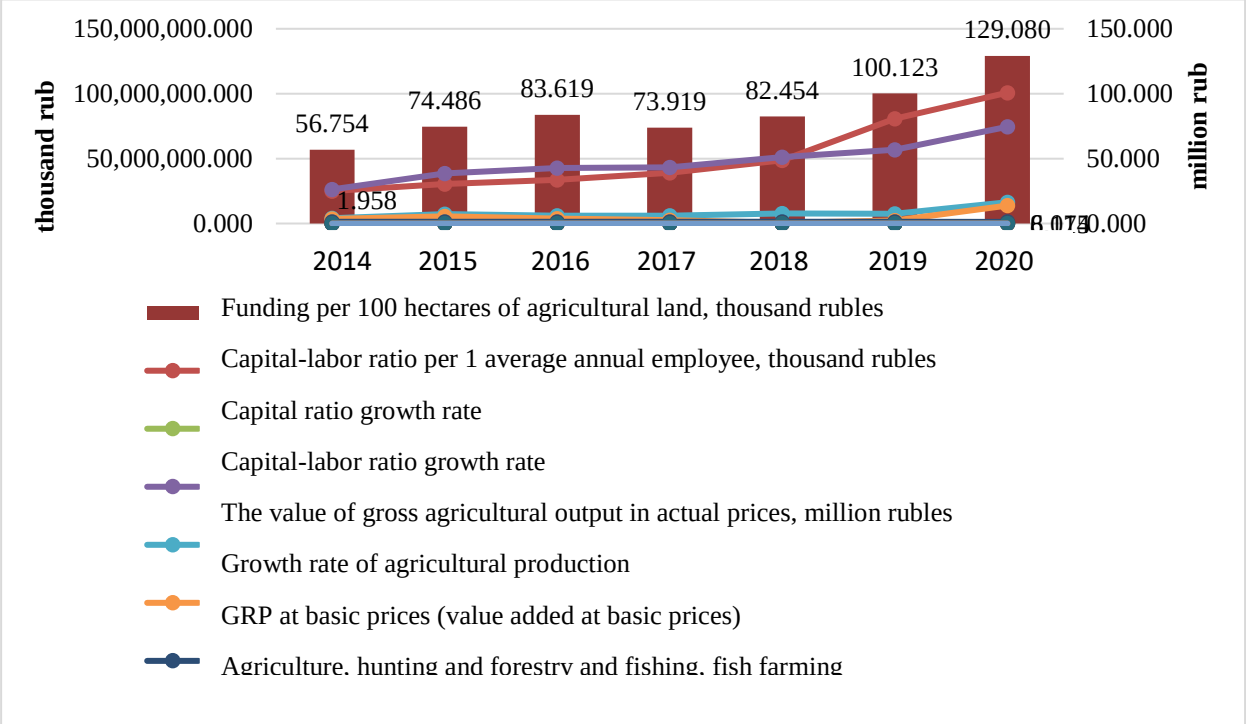

Fig. 1. Dynamics of gross agricultural output and provision of fixed assets of agricultural producers
Source: Compiled by the authors based on data from the Territorial Authority of the Federal State Statistics Service in the Penza Region [12].

The dynamics of gross agricultural output corresponds to the trends in the change in capital ratio in value terms. In the period from 2018 to 2020, when there is the most active increase in capital ratio and capital-labor ratio, there is an intensive increase in the volume of agricultural production.

In 2014, the value of gross agricultural output in the Penza region amounted to 56,754 million rubles, then in 2020 - 129,080 million rubles, or 2.3 times more.

And if at the beginning of the period under review there were 1,479 thousand rubles per 1 agricultural worker of fixed assets, then in 2020 the number reached up to 6,114 thousand rubles, or 4.1 times more. Correlation of fixed assets with land resources of agriculture makes it possible to obtain and analyze such an indicator as capital security. In terms of 100 hectares of agricultural land in the region, there were 1,958 thousand rubles of fixed assets in 2014, and in 2020 - 8,075 thousand rubles (growth rate 4.1 times).

Consider the structure of fixed assets of agricultural enterprises in the Penza region (Figure 2).

The share of the passive part of fixed assets, which includes buildings and structures, increased from 37.2% in 2014 to 49.2% in 2020.

The cost of land plots practically did not change during the analyzed period. However, against the background of an increase in the total cost of fixed assets, their share decreased from 11.9% to 4.8%.

The share of machinery, equipment and vehicles that make up the energy potential decreased in the analyzed period - from 44% in 2014 to 42.0% in 2020.

According to the latest annual review of the situation in the agro-industrial complex published by Rosstat, as of December 31, 2012, agricultural producers in the Penza region had 3,391 tractors, 885 grain harvesters and 96 forage harvesters.

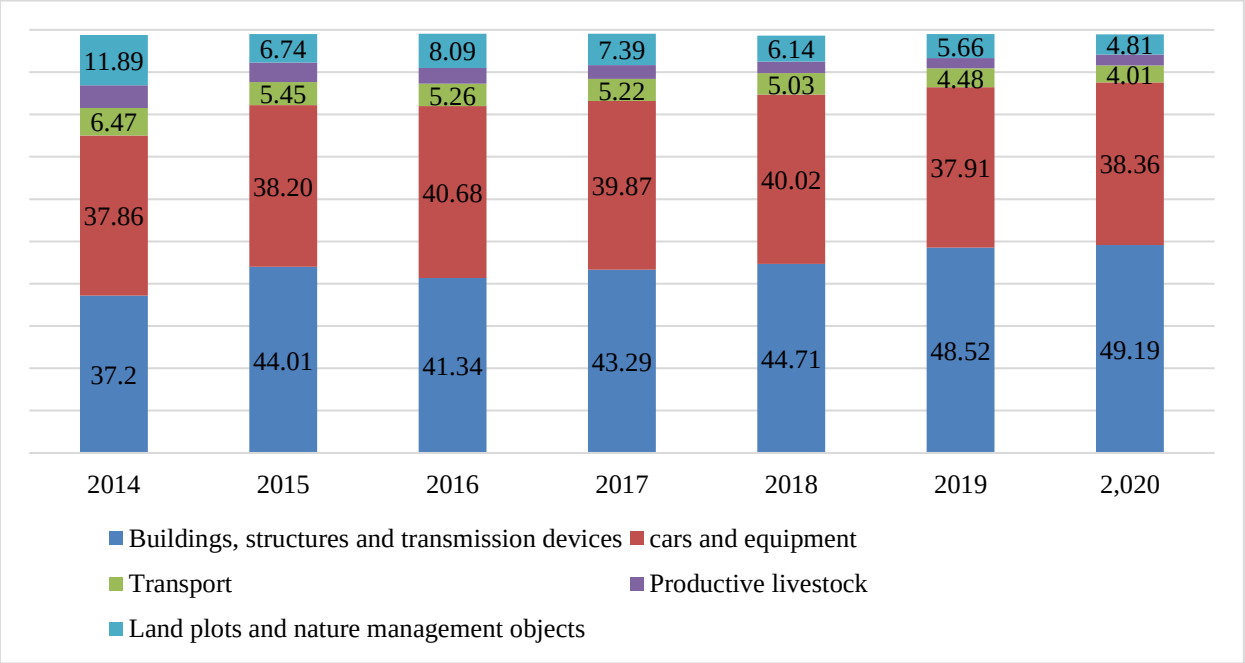

Fig. 2. Structure of fixed assets of agricultural enterprises in the Penza region
Source: Compiled by the authors based on data from the Territorial Authority of the Federal State Statistics Service in the Penza Region [12].

Since December 31, 2020, all regional agricultural producers had in general 2,720 tractors (80.2% compared to the corresponding date of 2012), 741 combine harvesters (83.7%) and 207 forage harvesters (46.3%) (Table 1).

Table 1. Types of the main equipment in agriculture of the Penza region

Type of equipment	2012	2014	2016	2017	2018	2019	2020
Tractors	3,391	2,959	2,787	2,847	2,643	2,625	2,720
Plows	728	628	669	662	731	657	606
Cultivators	1,669	1,461	1,389	1,418	1,362	1,301	1,188
Seeders	1,317	1,083	1,061	1,068	1,224	1,213	880
Mowers	440	364	337	331	336	311	301
Balers	281	246	224	211	209	192	181
Windrowers	270	223	215	230	226	260	227
Combines:							
grain harvesters	885	718	704	764	731	771	741
potato harvesters	16	20	17	17	18	19	14
forage harvesters	207	166	154	136	118	101	96
Beet harvesters	84	62	62	74	74	84	80

Source: Compiled by the authors based on data from the Territorial Authority of the Federal State Statistics Service in the Penza Region [12].

A common characteristic of the agricultural machinery fleet is that for a long period there has been a pronounced tendency to reduce it, affecting almost all major types of equipment. As we can see from Table 1, this trend continues up to the present.

A decrease in the total stock of agricultural machinery could have an objective positive character when it is explained by an increase in the productivity of machinery, or a reduction in the area of arable land. As for the last factor, in 2020 the area of arable land in the Penza region was estimated at 2,263.5 thousand hectares. In 2012, the same indicator was equal to 2,259.3 thousand hectares. Since at least 2012, there has been no reduction in arable land.

Thus, against the background of a relatively stable area of arable land and a reduction in the agricultural machinery available in the

park, there is a natural decrease in the provision of agricultural machinery in terms of 1,000 hectares of arable land. This is clearly shown in Table 2.

Table 2. Machinery and energy capacities of agriculture in the Penza region

Indicator	2012	2014	2016	2017	2018	2019	2020
There are energy capacities per 100 hectares of sown area, l, s.	181	151	135	142	140	130	139
Arable land per tractor, ha	296	483	522	503	544	548	578
Grain crops per grain harvester, ha	507	477	716	645	667	718	742
Accounts for 100 tractors, pieces:							
plows	21	21	24	23	28	25	24
cultivators	49	49	50	50	52	50	48
seeders	39	37	38	38	37	37	35
mower	13	12	12	12	13	12	12

Source: Compiled by the authors based on data from the Territorial Authority of the Federal State Statistics Service in the Penza Region [12].

A direct consequence of the increase in the load of arable land per unit of equipment is the delay in the implementation of the main field work, which leads to a decrease in crop yields and an increase in losses during harvesting. Low technical equipment is one of the main obstacles to the development of innovative technologies by agricultural producers [6].

This is a clear confirmation of the fact that the reduction in the number of agricultural machines in the region was not associated with a change in the turnover of agricultural land.

Another expression of the same trend is the indicator of arable land load per tractor, monitored and published by Rosstat [8].

As part of the study of the efficiency of the use of fixed assets as the most important element of production potential, a grouping of agricultural organizations of the Penza region was carried out according to the capital ratio (Table 3).

125 agricultural organizations were examined, characterized by different scales of production, specialization and economic conditions. The grouping did not include holding-type agricultural enterprises.

The absence of a clearly defined relationship between capital ratio and return on assets confirms the fact that the cost expression of fixed assets of an enterprise does not quite objectively reflect the availability and quality of available resources.

There may be several reasons for this. One of the main reasons is the high and disproportionate growth in prices for industrial groups of goods and agricultural products [11].

Given the rate of inflation and the long period of use of fixed assets, there is a disparity in cost indicators.

So, for example, a tractor purchased in 2015 (or even earlier) continues to be used at the present time, and its accounting value in the financial statements often does not correspond to the market valuation.

In addition, involved legal entities and individuals can take part in the production of agricultural products, which, having their own machine and tractor fleet, provide services for an agricultural enterprise.

Therefore, the volume of fixed assets used for the production of the final product is not fully reflected in the statistical and annual reports of agricultural organizations.

For example, the first group included 30 enterprises with a minimum level of capital productivity. And it is in this group that the maximum return on assets in terms of revenue and gross income was obtained. The low cost of fixed assets played a decisive role here. But the profitability of fixed assets in this group has a minimum level and a negative value.

Maximum profitability of funds in the group of enterprises with the highest capital ratio.

In addition to the absolute availability of fixed assets, production efficiency is influenced by

the movement of fixed assets, that is, the speed of their replacement with new objects. This is especially true for the active part of fixed assets - machinery and equipment.

The analysis made it possible to reveal one more dependence on the capital ratio: the higher the level of equipment with fixed assets, the more taxes the company pays to the budget. This fact should be taken into account in the formation and development of regional strategies for investing in the agro-industrial complex.

Table 3. The impact of the capital ratio of agricultural enterprises on the efficiency of the use of fixed assets and financial indicators, 2020

Indicator	Groups of enterprises by capital ratio per 100 hectares of agricultural land, thousand rubles				Total and average
	up to 1,000	1,001-2,500	2,501 - 5,000	5,001 and more	
Number of enterprises in the group	30	46	36	13	125
Average annual cost of fixed assets, million rubles	1,888.19	8,158.72	10,631.91	13,959.62	34,638.44
Capital security per 100 hectares of agricultural land, thousand rubles	714.67	1,778.53	3,570.80	10,414.83	2,905.72
There are machines and equipment per 100 hectares of arable land, thousand rubles	555.42	1,166.31	2,282.32	3,909.32	1,581.53
Capital-labor ratio, thousand rubles	1,290.63	2,625.92	3,010.17	6,779.81	3,409.00
Growth rate of fixed assets, %	35.61	13.46	27.71	11.67	18.02
Renewal coefficient, %: fixed assets - total	27.26	18.01	21.60	15.82	18.83
including machinery and equipment	28.62	11.75	16.51	10.80	14.52
Wear coefficient, %: fixed assets - total	0.43	1.86	1.93	2.04	1.85
including machinery and equipment	50.27	49.76	37.26	29.49	37.86
Return on assets (in terms of revenue), thousand rubles	56.15	63.52	49.11	52.54	54.70
Return on assets in terms of gross income, thousand rubles	1.78	1.00	0.86	0.52	0.80
Return on funds, %	-38.94	-10.95	9.70	5.55	0.51
Production profitability level, %	1.17	10.38	14.84	17.96	10.24
Received budgetary funds - total for the group, million rubles.	74.65	118.76	141.27	609.17	943.86
per 1 enterprise, thousand rubles	2,488.44	2,581.63	3,924.27	46,859.52	7,550.85
Taxes and fees paid – total for the group, million rubles	221.84	547.67	605.65	538.51	1913.66
per 1 enterprise, thousand rubles	7,394.50	11,905.87	16,823.58	41,423.46	15,309.27

Source: Compiled by the authors based on the annual accounting (financial) statements of agricultural organizations in the Penza region.

CONCLUSIONS

Weak sides of the use of fixed assets are: a rather high level of capital intensity of the industry, associated with the acquisition of expensive machines, the construction of elevators, grain storage, potatoes and vegetables; decrease in indicators of capital productivity and capital profitability; underdeveloped service maintenance of agricultural machinery [7].

The main threats to the use of fixed assets are: depreciation of a piece of equipment, lack of qualified engineering and technical personnel to work with new high-tech equipment; insufficiently stable financial condition of individual agricultural organizations, which may prevent the acquisition of new fixed

assets.

Opportunities to improve the efficiency of the use of fixed assets by agricultural organizations of the region could be achieved through the technical improvement of labor tools and production technologies; focus on the high technical level of fixed production assets; more complete use of fixed assets and a reduction in the need for new production capacities when the volume of production changes [4]; increasing the degree of utilization of fixed assets per unit of time by determining the optimal mode of operation [13].

Thus, the rational use of fixed assets in order to increase the efficiency of production potential is one of the main tasks for ensuring sustainable development of both the region as a whole and agricultural organizations.

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