Development vector of agriculture in the Moscow region

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Abstract. The paper deals with the development of agricultural sectors in the Moscow region. The analysis of growth (decline) of agricultural products in dynamics of the Moscow region is given, factors limiting increased production of the main types of agricultural products are identified, and areas for further development of agriculture in the region are offered. The problems that will increase the production of agriculture of their own production and provide the population of Moscow and the Moscow region with food are described, according to medical consumption standards. The conditions and prospects for the development of agriculture in the Moscow region are considered.

1. Introduction

Providing the population with food is one of the most major, important and primary tasks of every society. The stability and sustainable development of the country’s economic activity depends on this. No other branch of the national economy, such as agriculture, supplies people with such necessary products for daily consumption that ensure the normal functioning of the human body. Agriculture produces food for the country’s population, raw materials for the processing industry, and provides for other needs of society. The population’s demand for consumer goods is almost at 75% covered by agriculture [1].

The purpose of agricultural development, in the current conditions, is to provide the population with agricultural products and food of their own production, as well as to create a safe epizootic and veterinary-sanitary well-being of the region.

The main challenges facing agriculture are as follows:
- to increase the competitiveness of crop and livestock production;
- to create the necessary conditions for improving the quality of life of the rural population through the development of social infrastructure and development of settlements located in rural areas;
- to implement the state socio-economic program in the field of agriculture, taking into account the sustainable development of rural areas [2].

2. Materials and methods

The paper uses the method of analysis and synthesis of information, abstract-logical method of its processing and monographic research method. A comprehensive approach is implemented and a comparison method is applied. The authors critically summarized the scientific research of some Russian authors on the problem under consideration, a number of indicators that characterize changes in the production of basic products in farms of all categories of the Moscow region, the availability of tractors, harvesters and agricultural machines in agricultural organizations of this subject of Russia are presented in tabular form and analyzed. Financial investments of organizations in the main types of
economic activity in the Moscow region are also considered.

The information base of the research was made up of data from the Ministry of Agriculture of the Russian Federation[3]and the Federal State Statistics Service of the Russian Federation [4]; reference materials of specialized publications on the subject under study; materials, own research; data from Internet resources.

3. Results

Russian agriculture faces the urgent problem of increasing agricultural production and developing export potential [5]. In this regard, the role of the country’s regions, which are located near major cities, especially the capital, is increasing, as agricultural and food enterprises participate in meeting the needs of the increasingly urbanized population.

In the Moscow region, there are more than 490 agricultural organizations of various forms of ownership and about 450 organizations of the food and processing industry, reduction in funding in this industry may lead to the departure of many entrepreneurs from the market, 6,6 thousand peasant farms and 592 thousand personal subsidiary farms may stop farming, thereby developing other industries. In total, 115.4 thousand people are employed in the agro-industrial complex of the Moscow region [3, 4].

Table 1 shows the change in production of the main types of products in farms of all categories of the Moscow region.

| Indicators             | 1991 | 2010 | 2015 | 2017 | 2018 | 2018 in % to 1991 |
|------------------------|------|------|------|------|------|-------------------|
| Cereals and legumes    | 529  | 172  | 415  | 427  | 369  | 69.7              |
| Potato                 | 1470 | 484  | 762  | 620  | 610  | 41.4              |
| Open ground vegetables | 786  | 472  | 566  | 513  | 531  | 67.5              |
| Milk                   | 1855 | 768  | 631  | 648  | 656  | 35.3              |
| Meat in slaughter weight| 258  | 190  | 202  | 228  | 241  | 93.4              |
| Eggs, million PCs      | 4316 | 512  | 207  | 139  | 140  | 3.2               |

Gross production of basic agricultural products in all categories of farms in the Moscow region in the period from 1991 to 2018 decreased significantly. This was mainly due to a sharp decrease in acreage under agricultural crops. Thus, the gross production of grain for the analyzed period decreased by 31.3 %, and potatoes and vegetables, respectively, by 58.6 and 32.5 %. The most negative situation is with the production of milk and eggs, where the production of these products fell by 64.7% and 96.8%, respectively [6]. At the same time, the acreage under grain and leguminous crops decreased by almost 45%, while the acreage under potato and vegetable crops decreased by 50 and 54%, respectively. [7].

Attention is drawn to the fact that while cereals and legumes are almost completely cultivated in agricultural organizations, the production of potatoes and vegetables has moved from agricultural organizations to personal subsidiary farms of the population. [8]. This trend is of some concern to the economic community and producers, and the interpretation is ambiguous.

In 1991, the share of potato acreage in households of the population was 34.3 %, and vegetables 26.3 % of the total amount of these crops sown in farms of all categories. The gross harvest of potatoes in households in 1991 amounted to 789 thousand tons and open-ground vegetables 121 thousand tons. Over the period from 1991 to 2018, the share of planting potatoes and open-ground vegetables in households increased to 57.6% and 41.1%, respectively. [7].

Many problems are connected with the functioning of large-scale production of fruit and berry products in Russia as a whole and in the Moscow region. Its effectiveness is very low, despite a number of positive aspects in the development of this industry observed in recent years [9].

A similar situation has developed in the production of livestock products in the Moscow region.
Thus, the number of cattle in agricultural enterprises in 1991 was 1172 thousand heads, including cows 478 thousand heads, pigs 623 thousand heads, sheep and goats 5.6 thousand heads [10]. The farms of the population had 46.3 thousand cattle, including 23.1 thousand cows, 132 thousand pigs, 133 thousand sheep and goats. In 1991, private households accounted for only 4 % of cattle, 5 % of cows, 17% of pigs, and 96% of sheep and goats. In 2017 more than 40% of the total number of cattle, 52% of pigs, and almost all the number of sheep and goats were already concentrated in private households [6].

In other words, the production of livestock products by 50 % was transferred from large agricultural organizations to personal farms of the population that do not have sufficient development of forage crops and compound feeds for growing and fattening farm animals. At the same time, only 10-12% of all agricultural land, including arable land on which animal feed could be grown, was concentrated in private households [2].

In addition, all agricultural machinery, mineral and organic fertilizers were also on the balance of agricultural organizations.

Table 2 shows the availability of tractors, harvesters, and agricultural machines in agricultural organizations in the Moscow region.

| Indicators                                      | 2010   | 2015   | 2018   | 2018 in % to 2010 |
|------------------------------------------------|--------|--------|--------|-------------------|
| Tractors of all brands                         | 6592   | 4669   | 4360   | 66.1              |
| Tractor trailer                                | 2366   | 1753   | 1703   | 72.0              |
| Ploughs                                        | 1297   | 117    | 123    | 9.5               |
| Cultivators                                    | 1374   | 963    | 918    | 64.6              |
| Seeders                                        | 952    | 686    | 626    | 65.7              |
| Combines and grain harvesters                  | 471    | 306    | 336    | 71.3              |
| Harvesters                                     | 638    | 436    | 350    | 54.9              |
| Machines for applying mineral fertilizers      | 501    | 335    | 272    | 54.3              |
| Milking machines and units                     | 814    | 586    | 551    | 67.7              |

For all agricultural crops in agricultural organizations in 2017, only 48 kg of mineral fertilizers were added per 1 ha in terms of 100 % of nutrients. This is at the same level as in 2010 (46.5 kg). Under grain crops it is clearly not enough to increase properly the yield of grain and leguminous crops. For potatoes in 2018, 417 kg per 1 ha was added, and for vegetable crops 344 kg, which was 2 % more than in 2010 and 30 % less for vegetable crops. At the same time, the specific weight of the area fertilized with mineral fertilizers was 52 % in 2018. The application of organic fertilizers per 1 ha of crops practically did not change in the period from 2010 to 2018 and was equal to only 25 kg, and the specific weight of the area fertilized with organic fertilizers over the entire sown area was only 6.7-7.3 %. [3]. This means that if we recalculate the entire area of agricultural crops, it will be 3.5 C per 1 ha.

It is difficult to imagine how it is possible to apply evenly 350 kg of organic fertilizers on 1 ha of seedling area. And where can organic fertilizers come from in agricultural organizations with such a large number of cattle in agricultural organizations in the region, and even in the current situation, the stockpiling and storage of manure. And how can you get 1 million 100 thousand tons of manure from 225 thousand heads of cattle if one cow in the stable period (7 months) receives only 4 tons of manure per year, and in the stable period only 2.5 tons. [2].

The volume of mineral fertilizer production in Russia in the period from 2010 to 2016 increased by almost 18 % and was equal to 36.8 million tons [4]. This growth was due to a significant increase in the utilization of existing capacities in general, including for the production of ammonia from 88% to 94%, for potash fertilizers from 83% to 91%, and the introduction of additional capacities in the amount of 4.3 million tons of mineral fertilizers per year. In the future, the companies that produce
mineral fertilizers will increase their existing capacity to a total of 27 million tons by 2030.

In this regard, we would like to see a vector of increasing their consumption mainly in Russian agriculture. In our country, mineral fertilizers are used almost 3 times less than in the United States. In the Netherlands, about 245 kg is applied to 1 ha of fertilized area, including feed crops, where about 43% is applied to crops and 57% to fertilize meadows. For cereals, 170 kg of mineral fertilizers are applied, and 270 kg for 1 ha of meadows. The yield of grain in the Netherlands is more than 74 C/ha with the introduction of 170 kg per 1 ha [7].

The sanctions on the supply of basic foodstuffs to Russia have had a serious impact on the use of meat and meat products, as well as milk and dairy products, so, if in 2013 the import of meat and meat products to the Moscow region was 250 thousand tons, and milk and dairy products were 1207 thousand tons, in 2018 these indicators were equal to 82 and 432 thousand tons, respectively, which is 4 and 2.8 times less than before the introduction of international sanctions.

At the same time, our own production of meat and meat products, as well as milk and dairy products, had not increased in this period and remained at the same level. [11]. Therefore, the importance of the agricultural sector indicates that we should treat it the same way, or at least no worse, than other vital production. However, unfortunately, in recent years, the development of this industry has been paid less and less attention, both from the country’s governing bodies and regional and local authorities.

4. Discussion

There is an impression that agriculture is financed, as it is customary to say in the circle of specialists, on a residual basis. First, we allocate material and monetary resources for mining and manufacturing, construction, wholesale and retail trade, transportation and storage of various industrial goods, for conducting operations with land and real estate, that is, for those areas of activity that give short-term benefits and a quick return on investment. And only then, if there are resources left, they can allocate a part, and at the same time a small part, to the development of such a vital industry as agriculture. It would be possible not to speak about it, to keep silent in favor of the country’s and regions’ leadership, but the analysis of the current state of agricultural financing shows the opposite.

The development of agriculture in the Moscow region has received very little attention from the region’s governing bodies and, above all, from the budget and financial departments. Thus, in 2018, only 15.5 billion rubles of fixed capital investments were allocated for the development of agriculture and forestry, as well as for hunting and fish farming. [4] We believe that this represents only about 2.7% of the total investment in all areas of economic activity in the region, while 18.5% was allocated for transport development and storage of products and goods, and 18.2% and 14.5% were allocated for real estate operations and manufacturing, respectively.

Table 3 shows the financial investments of organizations by main types of economic activity in the Moscow region.

Calculations show that for the amount of investment that is allocated annually for the development of agriculture and forestry, they can buy 3 thousand combine harvesters, or 6 thousand tractors, or build 15 farms for cattle with 400 head of cows each. But there are still other types of acquisition of fixed assets, which also need to direct investment in agricultural production. [1, 6].
Table 3. Financial investments of organizations by main types of economic activity in the Moscow region, billion rubles, 2018.

| Types of economic activity | Use of investments | Financial investment | Financial investment |
|---------------------------|-------------------|----------------------|---------------------|
| Agriculture, forestry, hunting, fishing, fish farming | 15.5 | 22.1 | 7.8 | 14.3 |
| Manufacturing activity | 81.3 | 1719.7 | 146.5 | 1573.3 |
| Wholesale and retail trade, repair of motor vehicles | 46.9 | 1540.4 | 94.7 | 1445.7 |
| Transportation and storage of goods | 104.6 | 281.5 | 113.4 | 168.0 |
| Real estate operations | 102.2 | 667.9 | 213.6 | 464.3 |
| Financial and insurance activities | 22.8 | 165.4 | 106.4 | 58.9 |
| Other activity | 187.5 | 326.9 | 27.4 | 289.2 |
| Total | 560.8 | 4723.5 | 709.8 | 4013.7 |

At the same time, long-term financial investments of organizations were primarily directed to real estate operations (30.1%), manufacturing (20.5%), transportation and storage of national economy goods (16.0%), financial and insurance authorities (15.0%), wholesale and retail trade, repair of motor vehicles and motorcycles (13.3%). Thus, almost 95% of all long-term financial investments were allocated to these five industries and organizations of economic activity alone, while only 1.1% of these funds were allocated to the development of agriculture and forestry, hunting, fishing and fish farming. [3, 4]. Financial investments of organizations for the development of agriculture in current prices in 2018 are 22.1 billion rubles, or 0.47% of the total amount of investments in all types of economic activities.

For comparison, 36.4% were allocated to manufacturing during this period, and 32.6% were allocated to trade and vehicle repair, respectively. 14.3% of all financial investments of organizations in the Moscow region were directed to real estate operations. Short-term financial investments of organizations in agriculture, forestry, hunting, fish farming and fishing in 2018 amounted to only 14.3 billion rubles according to the statistical authorities of the Moscow region, which is equal to 0.36% of the amount of financial investments for all types of economic activity in the region. The largest amount of short-term financial investments of organizations was directed to manufacturing (39.1%), wholesale and retail trade, repair of motor vehicles and motorcycles (36.0%), and real estate operations (11.6%).

In our opinion, it is necessary to change the residual principle of financing agriculture in the Moscow region. It requires the development of many branches of the agricultural sector of the region. In particular, the urgent problem is the efficiency of fruit and berry production in the Moscow region in order to increase the volume of providing the population of the capital region with fruits and berries. [12].

At the same time, as the practice of many developed countries shows, the state actively encourages its own agriculture not only to meet the needs of the population, but also to export agricultural raw materials and food abroad. [13]. At the same time, according to a number of experts, the production of environmentally friendly products can take an important position in the development of the export potential of the Russian agricultural sector [14].

5. Summary
The conducted research allowed to establish that in the current food market situation when all new and new sanctions are implemented for supply to the Russian Federation of separate types of agricultural raw materials and logistical resources, there is a need to change the vector of development of the industry to direct the flow of investments and financial investments not for the purchase of food abroad but for increasing the production of their own food, including for export.
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