Agricultural sector of the Khabarovsk Territory: status, problems and development prospects

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Abstract. Article analyzes agricultural sector of the Khabarovsk Territory for the period of 1990-2019. The production of crop and livestock was analyzed by category of enterprises, as well as land use in the agricultural sector of the region. As a result of the research, the main directions for the stabilization and development of agricultural production in the Khabarovsk Territory have been developed to meet needs of the population in milk, egg, fresh meat, and locally produced vegetables. An increasing role of farms in the production of livestock products is expected due to a decrease of households’ contribution.

The main condition for economic growth is intensification, the transition to innovative development. Agriculture industry of the Khabarovsk Territory developed mainly in an extensive way. The transition to an intensive way of development raises the importance of qualitative factors of economic growth, such as advanced technical and technological base, well-established organizational and economic relations, competent level of education and qualification of the workforce [1].

The agrarian sector of the Khabarovsk Territory is developing in difficult climatic conditions. Arable soils of the Khabarovsk Territory are characterized by low natural fertility, therefore they are acidic, weakly structured, mostly heavily loam, overmoistened during monsoon rains, and, as a result of this, are over compacted [2]. Humus in soils is in unstable composition and during intensive soil cultivation is rapidly destroyed [3]. Soil fertility in extreme environmental conditions quickly and significantly degrades [4].

Most territory of the region belongs to the risk zone of farming, which prevents the cultivation of a wide variety of crops. Arable land is thin, the humus horizon rarely exceeds 15-20 cm. Over 30% of arable land is reclaimed land. During the period of agrarian reforms in the region, there was a sharp deterioration in the use of agricultural land (figure 1). For the period of 1990-2018 agricultural land decreased by 141 thousand hectares (or 36%), arable land decreased by 39.7 thousand hectares (or 30%).

It must be mentioned that in 2018 relative to 2017, the area of arable land increased by 1.7 thousand hectares. The agricultural industry of the region is faced with an urgent problem - the involvement of unused agricultural land in circulation - only in the Khabarovsk, Lazo and Vyazemsky districts the commission of the regional Ministry of Agriculture identified about 15 thousand hectares of such land.

In 2018 relative to 2017 there was an increase of sown area, mainly due to increase in agricultural organizations and farms (figure 2).
Soybean cultivation has always been cost-effective for farms. At present, when the pricing policy for grain production is not stable, soybean cultivation is carried out both in enterprises and on farms. Currently, soybean is cultivated mainly in agricultural enterprises, in the conditions of 2018, 79.2% and 73.2% (table 1). Soybean crops in agricultural enterprises for the period of 1990-2018 increased by 1.8 times, in all categories of households - by 2.3 times. Gross soybean production exceeded similar index of 1990 by 3.8 times, soybean crop by 1.7 times. As a result, the structure of crops was violated - in 1990 the share of soybeans in the total sown area of the region was 15.7% up to 54.7% in 2018. At the same time, the area under perennial grasses decreased. Nowadays the repeated soybean
on soybean crops have become widespread practice on farms, which leads to a worsening of the phytosanitary situation, the spread of diseases and plant pests [5].

Table 1. Soybean production in the Khabarovsk Territory.

| Index                                      | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2016 | 2017 | 2018 |
|-------------------------------------------|------|------|------|------|------|------|------|------|------|
| Sown area, thousand ha                    | 19   | 13   | 12.8 | 11.7 | 15.1 | 25.0 | 25.3 | 33.5 | 44.1 |
| All categories of farm                    |      |      |      |      |      |      |      |      |      |
| Gross production, thousand tons           | 16.0 | 7.9  | 11.9 | 11.0 | 14.8 | 29.4 | 26.0 | 44.1 | 61.0 |
| Including agricultural enterprises        |      |      |      |      |      |      |      |      |      |
| Sown area, thousand ha                    | 18.0 | 10.8 | 12.1 | 10.8 | 12.4 | 16.8 | 25.3 | 22.8 | 32.3 |
| Gross production, thousand tons           | 4.8  | 7.3  | 11.4 | 10.0 | 12.6 | 21.1 | 17.5 | 32.3 | 48.2 |
| Farms                                    |      |      |      |      |      |      |      |      |      |
| Sown area, thousand ha                    | -    | 0.6  | 0.7  | 0.8  | 2.6  | 8.6  | 8.4  | 10.7 | 11.8 |
| Gross production, thousand tons           | -    | 0.9  | 0.5  | 0.9  | 2.0  | 9.7  | 9.5  | 13.6 | 14.6 |

In 2018 91% of potatoes and 85% of vegetables are produced by households, while in 1990 they were 82% and 46%, respectively. This process is caused by the increase in retail prices for potatoes and vegetables, a decrease in the living standards of the population in the region, therefore desire to create a more reliable food supply. Over 28 years there has been a relatively rapid transfer of potato production from large agricultural enterprises with the predominance of intensive cultivation technologies to small-scale farms with a high level of manual labor costs. If in 1990 the proportion of agricultural enterprises amounted to 18% of the total gross production of potatoes, then in 1995 - 5.4%, and in 2018 only 2.9%.

Before the start of market reforms, vegetable production increased on the basis of intensification, the emergence of specialized farms and greenhouses. In 1990 vegetable growing was a dynamically developing industry, and 57% of vegetable crops were concentrated in agricultural enterprises (figure 3). The government’s non-intervention in the industry predetermined a decline in vegetable production. Price disparity, inflation, the destruction of the public procurement system, violation of the seed production system, and the specialized equipment production cessation had an extremely negative impact on agricultural industry. The cultivation of vegetables has moved into small forms of entrepreneurship. The process of reducing crops in agricultural enterprises is associated with certain difficulties with cultivation, affected by the lack of funds to purchase expensive seeds, fertilizers, energy sources, agricultural machinery, and especially problems with the sale of products. Currently, in vegetable growing it has become increasingly difficult to maintain proper technology for the cultivation and harvesting of vegetable crops [6].

The livestock industry occupies a special place in agricultural sector due to the significant share in aggregate agricultural product. A lot of agricultural producers, regardless of management form, were not able to adapt to the new market conditions. The elimination of the state centralized production management system, the breaking of existing ties in the agricultural sector, and the sharp disparity in prices for agricultural products and industrial resources created unfavorable conditions for the development of livestock production and made it unprofitable. The decrease of cattle livestock, including cows, was mainly due to the reduction of livestock in agricultural enterprises (table 2).

Under the influence of chronic unprofitability in agricultural sector, the cattle livestock for 1990-2018 decreased by 13 times in the region, cows - by 12, pigs - by 21, poultry by 4 times. An increment of pigs livestock is observed at households and poultry increment is observed at farms. It should be noted that for the period of 1990-2018 decrease of households livestock is observed for all species of livestock and poultry.
Figure 3. The sown areas structure by category of farms in the Khabarovsk Territory.

Table 2. Livestock and poultry by farm categories, thousand heads.

| Index                      | 1990  | 1995  | 2000  | 2005  | 2010  | 2015  | 2018  | 2019  |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| All categories of farm     | 131   | 77    | 60    | 38    | 27    | 21    | 17.7  | 17.0  |
| including: cows           | 52    | 35    | 30    | 18    | 13    | 9     | 7.1   | 6.7   |
| pig                       | 346   | 153   | 73    | 56    | 63    | 55    | 18.8  | 16.2  |
| poultry                   | 7332  | 2911  | 1842  | 1766  | 1843  | 1803  | 1410.2| 1497.4|
| including agricultural enterprises | 101.5 | 48.3  | 35.5  | 22.5  | 16.8  | 12.4  | 8.5   | 7.8   |
| including: cows           | 38.8  | 19.   | 16.6  | 10.   | 9.1   | 5.9   | 3.6   | 3.2   |
| pig                       | 245.8 | 92    | 52    | 44.6  | 43.8  | 39.6  | 4.6   | 2.3   |
| poultry                   | 5734  | 2500  | 1396  | 1554  | 1685.3| 1690.5| 1286.1| 1382.5|
| farms                     |       |       |       |       |       |       |       |       |
| Cattle                    | -     | 1.5   | 1.1   | 0.8   | 0.9   | 1.6   | 3.0   | 3.1   |
| including: cows           | -     | 0.8   | 0.5   | 0.3   | 0.5   | 0.8   | 1.2   | 1.2   |
| pig                       | -     | 2.3   | 1.2   | 0.9   | 5.8   | 2.4   | 3.8   | 3.8   |
| poultry                   | -     | 5.0   | 2.1   | 1.6   | 1.7   | 5.6   | 8.6   | 8.8   |
| households                |       |       |       |       |       |       |       |       |
| Cattle                    | 28.4  | 26.5  | 22.6  | 13.3  | 9.2   | 7.0   | 6.2   | 6.2   |
| including: cows           | 12.4  | 14.7  | 13.0  | 6.7   | 4.2   | 2.7   | 2.3   | 2.3   |
| pig                       | 94.3  | 32.4  | 18.8  | 8.7   | 12.4  | 12.5  | 10.4  | 19.1  |
| poultry                   | 768   | 390.2 | 443.9 | 249.5 | 155.8 | 106.9 | 106.4 | 106.0 |

The decrease in the quantitative indicators of livestock production had an impact on the level of output. Region wide in 2018 the production of meat at all categories of enterprises in comparison with 1990 decreased by 5.6 times, milk – by 5.8, eggs - by 1.8 times. The production of all kinds of meat in the region in all categories of enterprises in 1990 amounted to 14 tons per 100 hectares of farmland, milk – 38.2 tons, eggs 140.6 thousand pieces, and in 2018 - 3.9 tons, 10.3 and 125 thousand pieces respectively. Should be noted the growth trend of egg production since 2015, mainly due to large specialized enterprises.
Table 3. Livestock production by farm categories in the Khabarovsk Territory, thousand tons.

| farm category          | year | 1990  | 1995  | 2000  | 2005  | 2010  | 2015  | 2018  | 2019  |
|------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| milk, thousand tons    |      |       |       |       |       |       |       |       |       |
| All categories of      |      |       |       |       |       |       |       |       |       |
| enterprises           |      |       |       |       |       |       |       |       |       |
| Including agricultural|      |       |       |       |       |       |       |       |       |
| enterprises           |      |       |       |       |       |       |       |       |       |
| farms                 |      |       |       |       |       |       |       |       |       |
| households             |      |       |       |       |       |       |       |       |       |
| Livestock and poultry, |      |       |       |       |       |       |       |       |       |
| thousand tons          |      |       |       |       |       |       |       |       |       |
| All categories of      |      |       |       |       |       |       |       |       |       |
| enterprises           |      |       |       |       |       |       |       |       |       |
| Including agricultural|      |       |       |       |       |       |       |       |       |
| enterprises           |      |       |       |       |       |       |       |       |       |
| farms                 |      |       |       |       |       |       |       |       |       |
| households             |      |       |       |       |       |       |       |       |       |
| eggs, mln. p.          |      |       |       |       |       |       |       |       |       |
| All categories of      |      |       |       |       |       |       |       |       |       |
| enterprises           |      |       |       |       |       |       |       |       |       |
| Including agricultural|      |       |       |       |       |       |       |       |       |
| enterprises           |      |       |       |       |       |       |       |       |       |
| farms                 |      |       |       |       |       |       |       |       |       |
| households             |      |       |       |       |       |       |       |       |       |
| Currently, the main producers of livestock products in the region are households. Their share in the total milk production in 2018 was 46.5%, while the share of agricultural enterprises - 40.1%, milk of all kinds - 82.4%. The production of households is mainly aimed at own consumption, the rest is sold at the markets, in the system of consumer cooperation, through procurement organizations. Thus, the conducted studies indicate that over the past three years there have been trends: an increase of pigs livestock and poultry at farms; growth of meat and milk production at households. Rational implementation of fertilizers, crop rotation, improvement of crops structure and the widespread use of varieties of local selections adapted to soil and climatic conditions, completion of all agrotechnical work in time and the reduction of losses will make it possible to increase the yield of grain crops in agricultural enterprises to 1.8-2.1 t/ha. Due to the weaker material and technical base of farms, the yield will be 1.5-1.6 t/ha. Such output of grain production will cover the needs of cattle in concentrated feed.

The use of soybean varieties of different ripening dates, implementation of fertilizers and herbicides over the entire area, the transition raised beds technology, the placement of crops according to the best predecessors, and the improvement of resource provision will increase yield and gross yield.

In the local climatic conditions, potatoes and the main vegetable crops — white cabbage, tomatoes, cucumbers, carrots, and beets can be successfully cultivated. It will be preferable to meet the needs of the region in potatoes and vegetables of local assortment by expanding the sown area and increasing productivity.

Dairy cattle breeding remains the leading industry in the Khabarovsk Territory, due to rational use of land resources, natural fodder land, and regular guaranteed income to agricultural producers.

With achieved productivity, prevailing prices and the level of support provided, dairy farming is turn out to be unprofitable. The increase of productivity in the forecast period will be the main factor for stabilization and further development of dairy farming. With an increase in productivity up to
5500-7000 kg, milk production of enterprises will reach the break even, a further increase of productivity will create conditions for cost-effective management in the industry.

An increase in livestock requires significant investment in the construction of livestock pens, the acquisition of breeding stock, and an increase in fodder production. Due to its features, agriculture industry cannot compete on the investment market with other sectors and has limited own resources. A significant part of the available buildings requires major repairs, reconstruction and replacement of equipment. Emerging resources will have to be directed to these arrangements [7]. The production of eggs, pork and poultry meat will be concentrated in agricultural enterprises.

Thus, despite the measures taken in recent years in the field of agricultural production, the list and depth of the problems, which are need to be solved to ensure sustainable economic development, have increased. Stabilization and further development of the agricultural industry in Khabarovsk Territory will be focused at increasing the availability of fodder for the livestock industry; meeting the needs of the population in milk, egg, fresh meat, vegetables. The need for potatoes is currently fully satisfied.

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