Rural development in the Far Eastern Federal District

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Abstract. The article presents the material relating to the current state and prospects of development of rural areas in the Far Eastern Federal district of Russia. It is shown which factors are restraining and which factors are stimulating, as well as the degree of influence of each group on the development of rural areas of the Far East of Russia. The practical significance lies in the fact that the results of the study can be useful in the development and justification of rural development programs and regional agricultural policy.

1. Introduction

Currently, in the light of the latest trends in the development of the Russian national economy, as well as global economic relations, there is a need to address issues related to the efficiency of agricultural land use, increase the profitability of agricultural production, ensuring sustainable development of rural areas.

A considerable number of works are devoted to the issues of increasing the efficiency and sustainable development of rural areas in the Far East and the country as a whole [1–3].

One of the objectives of this work is to develop proposals for sustainable development of rural areas of the Far Eastern Federal district of the Russian Federation on the basis of increasing the profitability and efficiency of regional agricultural production. The development of proposals was carried out within the framework of the adopted State program for the development of agriculture in the Far Eastern Federal district.

2. Materials and methods

In the development of proposals, the analysis and forecast of the rational use of agricultural land was carried out, the methods of correlation-regression and trend analysis were used, the balance method was used on the materials obtained from public sources (reports, statistical material). As a result of the application of these methods, the main problems in the agro-industrial complex of the Far Eastern Federal district are identified, proposals for the development of rural areas are given.

3. Study of the development of the agricultural sector and rural areas in the far Eastern Federal district

The agricultural sector of the Far East operates in difficult climatic and socio-economic conditions. The main reasons for this are the geographical location, climate, remoteness from major industrial centers and rural areas. More than 80 % of the region’s territory belongs to the far North and equated areas.

The economic reforms of the early 1990s produced different results, including both positive and
negative ones. The negative results, for example, include a long disparity in prices for agricultural and industrial products, which in turn led to a shortage of working capital and fixed assets, as a result—many agricultural enterprises became unprofitable, production and sales fell to extremely low levels, there was an outflow of the rural population.

Severe natural and climatic conditions in the far East have strengthened these trends and, together with the aggressive economic environment, have created a threatening situation for agriculture in the Far East.

The positive results of agrarian and land reforms in the far East (as well as throughout Russia) include, of course, the emergence of private agricultural organizations, the abolition of the state monopoly on agricultural land, the emergence of incentives for the rural population to process their own plots, to remain in rural areas, increasing the potential of rural areas. Positive results cannot be achieved without comprehensive state support.

At the moment, the Federal law "On the development of agriculture" of 29.12.2006 N 264-FZ, as amended in December 2018, defines the main provisions and vectors of the development of the state agrarian policy [4–6].

In order that the negative phenomena were as much as possible weakened or could be more systematically controlled, in the process of implementing the state agrarian policy it is necessary to take into account the regional features of the Far East, including its economic sectoral structure, the features of the social sphere and so on [7].

Therefore, the study of trends, factors and conditions that determine the results of the agricultural sector in a particular region is not only scientific, but also practical, and thus economic entities will be able to more reasonably approach the improvement of business and increase the production of competitive products.

We believe that the effectiveness of rural development is consistent with such criteria of efficiency of agricultural and land policy as: increasing the number of working population and fertility in rural areas; increasing the area of rural areas; increasing the area of effectively used productive land; the formation of effective mechanisms of state influence on the sustainability and balance of production and economic indicators of agricultural and industrial activity; ensuring the protection of land fertility; increasing the share of environmentally friendly products; increase in exports of agricultural raw materials and products of food and processing industry with simultaneous growth of the share of deep processing products in total exports.

The agricultural sector of the Far East is characterized by uneven provision of land resources and especially arable land. Rural areas exist and operate in difficult conditions. It is worth noting that the agricultural lands of the Far East are characterized by a sufficiently low natural fertility, and the organizational scheme of agriculture is complicated by the remoteness of production and sales centers of both production resources and finished agricultural products.

An important aspect that also has an impact is the state of the material and technical base of enterprises and the labor potential of the rural population. Nevertheless, taking into account all the above, we can say that all activities that contribute to a more complete and effective use of land can be combined into the following groups:

1. Inclusion in the production use of each hectare of land assigned to the economy: it is unacceptable that they fall out of economic turnover.
2. Increase of economic soil fertility is primarily irrigation and drainage, chemical reclamation, application of fertilizers, development of crop rotations, surface and radical improvement of meadows and pastures.
3. Preservation of fertility and conservation of soil: field-protective afforestation, soil conservation technologies and crop rotations, the system of measures on combating water and wind erosion.
4. Rational use of economic soil fertility: the use of the most productive varieties, improved seed production, improvement of plant placement schemes, compliance with the optimal timing of agricultural work, the fight against plant diseases, pests and weeds.
5. Organizational and economic activities: improving the structure of acreage taking into account
market conditions, deepening specialization, the use of progressive forms of organization and remuneration, improvement of forms of management, etc.

Organization of effective use of agricultural land is possible only on the basis of rational organization of the territory of specific agricultural activities. To do this, it is necessary to develop land management projects with a detailed study of organizational, economic and agro-economic justification.

The Far Eastern Federal district is the largest district of Russia, its area is 6,217 thousand km² or 36.4% of the country. More than 80% of the territory of the Far East are legally assigned to the regions of the Far North and equated to them areas. 90% of them are covered by permafrost, in the remaining territories there is a long seasonal freezing of soils, thus, in the land Fund of the region, agricultural lands occupy 1.1% of the territory, and arable land — only 0.4% [8].

The main agricultural territories of the Far Eastern Federal district are the Amur region, Primorsky and Khabarovsk territories, as well as the Jewish Autonomous region, they are called the southern territories of the Far Eastern Federal district, which are part of the Amur river basin. In these regions concentrated 4,244 thousand hectares of agricultural land or 78.7% of all farmland in the Far East.

In Primorye and in the South of the Amur region, many crops are cultivated, including heat-loving ones: soybeans, rice, corn, tomatoes, grapes. The area of the southern territories is 1.5 million square kilometers, which is 24% of the entire territory of the Far East.

On the territory of the South of the Far East, the largest areas of land are occupied by forests. The potential of soils in the region is small, but sufficient for the formation of average yields in conditions of limited use of fertilizers.

In order to increase the productivity of agricultural land and obtain sustainable crops, a regular set of measures for soil treatment is necessary: land reclamation and irrigation, the use of innovative technologies to restore soil fertility.

During the period of agrarian reforms in the Far East, there was a deterioration in the use of agricultural land. If in 1990 − 6,649 thousand hectares of land were used in agricultural production, including 3,191 thousand hectares of arable land, in 2014 − 5,405.1 thousand hectares of land and 2,565.4 thousand hectares of arable land, and by 2019, according to various estimates, the area of arable land has decreased to 2,500 thousand hectares.

The structure of agricultural production is dominated by soybean. The main regions in which soybean sowing is carried out are the Amur region (up to 70% of all crops are concentrated), the Primorsky region (18.3 % of crops), the Jewish Autonomous region (9.1 % of crops), the Khabarovsk region (2 % of crops).

It is necessary to say about the investment potential of the region in question. It should be noted that in the region as a whole, there is a tendency for a decline in investment in the agricultural sector. The material and technical base of the manufacturers is deteriorating, there are no comprehensive programs for updating equipment and machines. Unfortunately, for most manufacturers, access to subsidized loans is denied, in view of this, the renewal of fixed capital is not possible.

Note also the disappointing trends in the state of the park of agricultural machines. The park of combine harvesters in the region decreased by 8 times, forage harvesters - by 16 times, and potato harvesters by 28. Disposal of other types of equipment also exceeds its intake. Plows, seeders, cultivators, sowing complexes, sprayers, equipment for fodder among the scarce machines.

Due to the reduction, and in some cases, the cessation of the production of machines in Russia, agricultural producers were forced to buy imported equipment until 2014, but after the start of the international competition struggle for many people, the purchase of foreign equipment was not available.

Due to the prevailing economic conditions, work on land reclamation has practically ceased. A significant part of irrigated and drained land is taken out of circulation and without reconstruction of the amelioration systems it is impossible to put them into economic circulation. More than half of the irrigated and drained lands are in unsatisfactory condition.

Under current conditions, it is unrealistic to count on a massive influx of private investment in the agricultural sector of the Far East in the coming years.

The widening of the gap between the living standards in the city and in the countryside increases the social unattractiveness of the rural areas, stimulates the migratory moods of the rural population,
threatens the disruption of the development programs not only of the agricultural sector, but also of the entire economy of the region.

The rural population of both Northern and southern border areas is declining. In the southern territories, the rural population decreased by 20% by 2019. Local residents continue to leave the far Eastern Federal district.

Since 2018, the outflow of population has increased and for the first 4 months only due to the outflow of local residents, the number has decreased by 20 thousand people. Unfortunately, there are no actual statistics on the outflow of the rural population for 2019, but table 1 contains data on the migration outflow for the period from 2000 to 2015, which generally allows us to understand the processes of the outflow of the rural population [9].

Young people and people of working age leave the village most actively, the population is aging, and the gender balance is violated. Similar processes are taking place in rural areas. According to the forecast, by 2020, with an increase in the total load by 25.5%, 49.6% will fall to children and 50.4% to persons older than the working age.

Table 1. Migration growth rates (per 10 000 people)

| Territory                  | 2000 | 2005 | 2010 | 2012 | 2013 | 2014 | 2015 |
|----------------------------|------|------|------|------|------|------|------|
| Russian Federation         | 24.7 | 20.0 | 19.0 | 20.6 | 20.6 | 18.8 | 16.8 |
| Eastern federal district   | -83.4| -80.5| -49.4| -31.8| -53.0| -39.8| -39.0|
| Primorsky territory        | -44.3| -50.6| -34.8| -5.7 | -36.7| -20.4| -14.5|
| Khabarovsk territory       | -38.3| -92.9| -30.8| -4.0 | -22.2| -18.9| -36.9|
| Amur region                | -91.0| -99.9| -59.9| -52.8| -70.9| -15.6| -46.7|
| The Jewish Autonomous region | -51.7| -158.8| -49.1| -89.2| -124.8| -108.2| -120.4|

Attracting foreign labor is an objective process, but it should be clearly regulated by the state. It is advisable to attract labor from the CIS countries, to simplify the procedure for obtaining Russian citizenship to persons who have moved to permanent residence in the far East.

The involvement of citizens and companies of China, the Republic of Korea and North Korea creates conditions favorable not only for foreign companies, but for all parties of economic cooperation.

In recent years, more than 90% of agricultural enterprises do not conduct training, which leads to the degradation of the labor force. Low qualification of personnel leads to inefficient use of all resources and stimulates production decline.

We believe that the basis for the development of proposals for sustainable development of the region should be applied methods of mathematical modeling, including the blocks presented in table 2 [10, 11].

When developing the forecast of development of agriculture of territories of the far Eastern Federal district till 2030 two enlarged scenarios are developed:

The first – inertial, which reflects the actual trends in the development of agriculture. It is assumed that in the future they will remain unchanged. It is expected that the improvement of certain elements of the economy of the agricultural sector will be gradual, evolutionary in nature, and this will cause a low rate of growth of agricultural production.

The second – an optimistic scenario - is based on the assumption of the normative provision of agriculture with resources and its management in accordance with the zonal systems of agriculture. This scenario is based on optimistic trends and can be used as an indicator of the development opportunities of agricultural production sectors, which should be sought.
Table 2. The structure of the economic and mathematical model of forecasting the production of agricultural products and the need for material and technical resources

| A | Box 1. Forecast of production volumes of agricultural products |
|---|---|
| 1. | Econometric model |
| 1.1 | Trend models (dependences linear, exponential, power, logarithmic), |
| 1.2 | Correlation and regression models |
| | $Y = a + b_1x_1 + b_2x_2 + \ldots + b_nx_n$ – multiple correlation |
| 2. | Simulation modeling |

| B | Box 2. Forecast of material and technical resource requirements |
|---|---|
| 1. | Balance model |
| 1.1 | \(Q_{fitz} = \sum [(V_i \cdot N_i \cdot K_i) \cdot S_i]\) - where \(Q_{fitz}\) – fertilizer demand, total; \(V_i\) – I-th crop yield; \(N_i\) – fertilizer application rate per 1 centner of the i-th type of product; \(K_i\) – correction factor for soil nutrient content; \(S_i\) – sown area of the i-th crop |
| | \(Q_{fualu} = \sum (N_o \cdot S_i)\) - where \(Q_{fualu}\) – demand for fuels; \(N_o\) – fuel rate at a certain yield of the i-th crop; \(S_i\) – sown area of i-th culture |
| | \(Q_{pocc} = \sum (N_i \cdot S_i)\) - where \(Q_{pocc}\) – electricity demand; \(N_i\) – the rate of electricity consumption per unit of the i-th type of product at the projected yield; \(S_i\) – sown area of i-th culture |
| 1.2 | \(Q_{ik} = \sum [(N \cdot U_i \cdot n) \cdot K_{ik}]\) – where \(Q_{ik}\) – volume of i-th type of feed; \(N\) - feed requirements per 1 head of livestock; \(U_i\) – the proportion of the i-th type of feed in the structure of feed; \(n\) – livestock population; \(K_{ik}\) – coefficient of nutritional value of the i-th type of feed |
| 3 | \(V_i = Q_{ir} + \sum_{i=1}^{m} Q_{ip} - \sum_{i=1}^{n} Q_{ir}\) - where \(V_i\) – the projected volume of the region’s demand for i-th kind of product; \(Q_{ip}\) – the volume of receipt of the i-th product in the region by m-channels; \(Q_{ir}\) – the volume of export of the i-th type of product by n-channels and its consumption for further processing in the region |

4. Conclusion
According to the developed proposals for the development of agricultural production in the Amur region, there is a steady growth in the acreage of grain crops. In agricultural organizations, the growth will be 15.7% by 2030 in relation to 2015, in the Peasant Farm – by 22.2%. As noted earlier, in the Amur region, most of the arable land has been developed and used by various agricultural producers. Accordingly, the increase in gross revenues is achieved through the intensification of production. For all crops in the forecast period projected yield growth of 10-18%.

In the Khabarovsk territory, the implementation of proposals for the first option for the development of grain production will increase the acreage in agricultural Enterprises in 2025 in relation to 2011 by 0.5 thousand hectares, the second option — by 1.3 and the third option — 2.6 thousand hectares.

In the Primorsky Territory, in the first variant of the development of the agricultural sector, there will be a slight increase in acreage in all categories of farms and will amount to 334.4 thousand hectares in 2030. Potato and vegetable growing in the region should be carried out on the basis of a rational combination of potato and vegetable production for local consumption with the formation of specialized...
enterprises focused on the cultivation of seed products and focused on export to the northern regions of the Far-Eastern Federal District.

Agri-food industry can be one of the main sectors in the economy of the Far East. For the Russian leadership, the need for self-reliance has become apparent since the beginning of the country's economic and political isolation. After the establishment of sanctions, import substitution is used both as a response mechanism to Western sanctions for illustrative purposes, and as a timid attempt to sovereign the Russian economy. The development of rural areas of the Far East is impossible without an integrated approach to the development of agricultural production, ensuring access of producers to credit resources, popularization of the rural lifestyle.

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