Regional land use by farms of the Russian Federation

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Abstract. World practice shows the important role of farming in agricultural production and its significant impact on the level of rural life in the country. The purpose of the study is to examine the state of farming in Russia today. This form of hosting in the Russian Federation began to revive relatively recently and is developing more actively than other forms in rural areas. But it is accompanied by a number of problems requiring attention from the state: lack of access to additional funds for a significant proportion of farms (both subsidies and loans); conflicts of interest with large landowners; low viability of small farms; low qualification of the labor force, including the heads of farms; the presence of fictitious farms without land area and farms with a huge area with a high proportion of employees. The situation is significantly aggravated in the regions with unfavorable agro-climatic conditions, such as the Non-Black-Earth Zone, the northern regions of the Volga Region, the Urals, and Siberia. Existing support programs at the federal level are not enough, agricultural cooperation is not developing. In most of the subjects with relatively low development of the peasant (farm) economy, programs for supporting small farms have not been adopted. In order to ensure the development of rural areas, taking into account the interests of the local population, it is proposed to assign the responsibility of land management to the experts, who could plan the development of the agro-industrial complex in rural areas.

1. Introduction

In line with the recommendations of the Food and Agriculture Organization of the United Nations, large-scale investments in agriculture should serve the interests of small landowners and local communities [26]. The contribution of small landowners to the incomes of rural residents plays a high role in reducing poverty and is a driving force for the growth of the local economy [1].

The growth of incomes of small landowners is directly related to the growth in demand for non-farm consumer goods, which is a factor stimulating the production in all sectors of the economy. The impact of agricultural growth is 3 times more effective in reducing the number of poor people than the impact of growth in other sectors of the economy [26]. The use of family labor for the production of labor-intensive crops that require careful maintenance allows us to achieve better results than the use of wage ore on large farms, as well as reduces costs of the control functions [2, 3].

With the development in rural areas of production with the wide involvement of hired labor, there is a conflict of interests of large corporate organizations and the local population in the process of turning land plots. On the one hand, large-scale corporate investments in acquiring land not used by local communities contribute to creating necessary infrastructure, transferring technology and practical experience, creating jobs and providing sources of income [4, 5].
On the other hand, investments in land acquisition and in violation of the rights of existing land use, especially in the absence of strong management and institutions that protect the rights of local residents, are associated with major risks of socio-economic upheavals, losing the right to use the land or loss of access to land and loss relevant livelihoods of local communities. The newly created jobs, instead of the previous ones, are not always inherited by local residents, and their number is decreasing [6, 7].

Positive consequences for the local economy in increasing the volume of agricultural production and yields, increasing export earnings, moving to higher production standards for accessing foreign markets, and improving the existing infrastructure were manifested in cases where investment projects were non-discriminatory and participation of local farmers in them, without displacing them. For example, in the implementation of contracting schemes, agricultural production on a contract basis, or in the organization of joint ventures. These positive measures contribute to the increase in income for contractors selling products or services to the headquarters. It is also highly beneficial for the earnings of small landowners, who have become employees and are given the opportunity to reinvest their earnings into their own farms [8, 9].

Preserving viable peasant farms and creating obstacles to the transfer of agricultural land, which is badly needed for local residents, to large corporate agricultural organizations are among the main tasks of local authorities. The question is relevant and abroad [10, 11]. For example, Asia, on the contrary, currently faces the problem of low efficiency of small farms in relation to large land tenure [12, 13]. The many-sided healthy structure of agricultural production is the basis of local communities.

The aim of this paper is to study the changes over the past ten years (from 2006 to 2016) in agricultural land use of peasant farms and their contribution to agricultural production in the constituent entities of the Russian Federation at present.

A large number of domestic scientists are engaged in studying this issue ([14-20], etc.), but they focus mainly on the scale of the entire state or individual regions, when one of the key tasks of this work is to analyze differences in the development of farms taking into account regional features.

2. Methods
The basis of this study is a systematic analysis of the results of the All-Russian Agricultural Census of 2006 [27] and 2016 [28] (Table 1-3, 6, Fig. 5), in conjunction with the data of the Unified Interagency Information and Statistical System (EMISS [29], Table 4-6, Figure 1, 3, 4) in both in the whole of the Russian Federation and in the context of the subjects, with their grouping according to similar agroclimatic, cultural, and socio-economic conditions.

Explanation of calculations in the Table 1: Graph 6 is defined as the difference of Graph 4 with Graph 2; column 7 is the ratio of column 6 to column 2. Explanation of the calculations presented in Table 6: column 4 is defined as the difference between the values of sown areas of all agricultural crops of peasant farms for 2017 with the same value for 2012 according to the Rosstat (EMISS); column 5 is the ratio of the value from column 4 to the value of the total sown area in farms of all categories for 2017 according to the Rosstat (EMISS); column 6 is the ratio of the size of the cultivated area of peasant (farmer) households in 2017 to the cultivated area of peasant farms in 2012 according to the Rosstat (EMISS).

3. Results
Since 1990, in Russia, in spite of the overall reduction in acreage, there has been an active development of peasant farms (Figure 1).
Figure 1. Sown areas of agricultural crops of various categories of farms of the Russian Federation.

According to the results of the 2016 All-Russian Agricultural Census, peasant farms use almost a third of the available agricultural land: 27.8% of arable land, 30.5% of forage land.

The growth of peasant land use is accompanied by a reduction in the number of farms (Table 1).

Table 1. Changes in the structure of land use of peasant (farmer) farms according to the All-Russian Agricultural Census of 2006 and 2016.

| Number of farms | Average farm size | 2006 % from everything | 2016 % from everything | 2016-2006 |
|-----------------|-------------------|-------------------------|------------------------|-----------|
|                 |                   | 1                       | 2                      | 3         | 4         | 5         | 6         | 7         |
| Up to 4         |                   | 59107                   | 25.0%                  | 24023     | 17.2%     | -35084    | -59.4%    |
| 4-10            |                   | 46504                   | 19.7%                  | 16329     | 11.7%     | -30175    | -64.9%    |
| 11-20           |                   | 28644                   | 12.1%                  | 13172     | 9.4%      | -15472    | -54.0%    |
| 21-50           |                   | 37921                   | 16.1%                  | 20534     | 14.7%     | -17387    | -45.9%    |
| 51-100          |                   | 22950                   | 9.7%                   | 15572     | 11.1%     | -7378     | -32.1%    |
| 101-200         |                   | 16747                   | 7.1%                   | 14826     | 10.6%     | -1921     | -11.5%    |
| 201-500         |                   | 13779                   | 5.8%                   | 16605     | 11.9%     | +2826     | 20.5%     |
| 501-1500        |                   | 7774                    | 3.3%                   | 13107     | 9.4%      | +5333     | 68.6%     |
| 1501-3000       |                   | 1675                    | 0.7%                   | 3806      | 2.7%      | +2131     | 127.2%    |
| 3001-6000       |                   | 607                     | 0.3%                   | 1519      | 1.1%      | +912      | 150.2%    |
| Over 6000       |                   | 249                     | 0.1%                   | 522       | 0.4%      | +273      | 109.6%    |
| Total           |                   | 235957                  | 100.0%                 | 140015    | 100.0%    | -95942    | -40.7%    |

| Area of agricultural land | 2006 % from everything | 2016 % from everything | 2016-2006 |
|---------------------------|------------------------|------------------------|-----------|
| Up to 4                   | 100.5                  | 0.4%                   | -66.0     | -65.7%    |
| 4-10                      | 306.9                  | 1.3%                   | -202.0    | -65.8%    |
| 11-20                     | 429.7                  | 1.8%                   | -241.8    | -56.3%    |
| 21-50                     | 1270.4                 | 5.3%                   | -590.4    | -46.5%    |
| 51-100                    | 1657.0                 | 6.9%                   | -536.3    | -32.4%    |
| 101-200                   | 2364.7                 | 9.8%                   | -235.5    | -10.0%    |
| 201-500                   | 4321.1                 | 17.9%                  | +1037.7   | 24.0%     |
| 501-1500                  | 6371.6                 | 26.4%                  | +4849.3   | 76.1%     |
| 1501-3000                 | 3360.9                 | 13.9%                  | +4361.6   | 129.8%    |
| 3001-6000                 | 2318.4                 | 9.6%                   | +3703.9   | 159.8%    |
| Over 6000                 | 1639.8                 | 6.8%                   | +3355.0   | 204.6%    |
| Total                     | 24140.8                | 100.0%                 | 15435.6   | 63.9%     |
As can be seen from the table, the number of peasant farms decreased by more than 40%, and the area of agricultural land used by them increased by more than 60%. The consolidation of farms took place to a greater degree: farms with an area of up to 200 hectares ceased to exist, new ones appeared or became larger than 200 hectares or more per farm. The largest relative increase occurred among farmers using more than 3,000 hectares, in absolute numbers, the largest increased farms of 500–1500 hectares (more than 5,000 farms). According to the census, almost 40% of the sown area of peasant farms belong to 3.6% of farmers with an average size of more than 3000 hectares of crops per farm (Table 2).

**Table 2.** Grouping of peasant farms by the size of the cultivated area at the end of 2016.

| Size of Cultivated Area (Hectares) | Number of Farms, Units | as a Percentage of the Number of Farms with a Cultivated Area |
|------------------------------------|------------------------|-------------------------------------------------------------|
| total                              | 77879                  | 100.0                                                       |
| to 10                              | 13707                  | 17.6                                                       |
| 10-50                              | 19964                  | 25.6                                                       |
| 50-200                             | 21927                  | 28.1                                                       |
| 200-1500                           | 19459                  | 25.0                                                       |
| over 1500                          | 2822                   | 3.6                                                        |
| Sown Area of Crops, Thousand Hectares |                       |                                                             |
| total                              | 22001                  | 100.0                                                       |
| to 10                              | 62                     | 0.2                                                        |
| 10-50                              | 570                    | 2.6                                                        |
| 50-200                             | 2420                   | 11.0                                                       |
| 200-1500                           | 10357                  | 47.1                                                       |
| over 1500                          | 8592                   | 39.0                                                       |
| on Average per Household, Hectare  |                        |                                                             |
| total                              | 532.3                  | 100.0                                                       |
| to 10                              | 4.5                    |                                                             |
| 10-50                              | 28.6                   |                                                             |
| 50-200                             | 110.4                  |                                                             |
| over 1500                          | 3044.7                 |                                                             |

The structure of sown areas is close to agricultural organizations (Table 3) with a difference in the ratio of grain and fodder crops. Farmers are more specialized in beef cattle than they are in agricultural organizations and traditionally small farms breed sheep and goats.

**Table 3.** Structure of sown areas and livestock of agricultural animals in agricultural organizations and peasant farms for 2016.

| Indicator | Agricultural Organizations | Peasant Farms |
|-----------|----------------------------|---------------|
| The Structure of Sown Areas by Types of Crops (as a Percentage of the Total Sown Area of the Corresponding Category of Farms) | | |
| Cereals and legumes, total | 58.9 | 67.2 |
| of which: Wheat | 34.3 | 40.2 |
| Technical crops, total | 17.3 | 18.4 |
| Potatoes | 0.4 | 0.7 |
| Vegetable and melon crops, total | 0.2 | 0.8 |
| Feed crops, total | 23.2 | 12.9 |
| Livestock of Farm Animals, Heads per Thousand Hectares of Agricultural Land | | |
| Cattle, total | 95 | 65 |
| Dairy cattle | 79 | 37 |
| Beef cattle | 17 | 27 |
| Pigs | 210 | 13 |
| Sheep and goats, total | 57 | 247 |
| Agricultural poultry, total | 4792 | 260 |

For 2016, the volume of agricultural production by farmers in monetary terms amounted to 12% of the total volume of farms of all categories (Table 4). Peasant farms occupy the largest share in the production of vegetables, grain crops, sunflower, sugar beet, wool, and potatoes. Similarly, the sale of products.
Table 4. The share of farms of each category in the production and sale of all agricultural products for 2016.

|                                | Peasant farms and individual entrepreneurs | Agricultural organizations | Households |
|--------------------------------|--------------------------------------------|----------------------------|------------|
| Implementation                |                                            |                            |            |
| Cereals and legumes           | 26.5%                                      | 73.1%                      | 0.5%       |
| Potatoes                      | 17.0%                                      | 32.9%                      | 50.1%      |
| Milk and dairy products       | 7.6%                                       | 69.0%                      | 23.4%      |
| Cattle and poultry (live weight) | 3.7%                                      | 83.7%                      | 12.6%      |
| Animal Hair and Hair          | 36.2%                                      | 20.4%                      | 43.4%      |
| Vegetables                    | 27.1%                                      | 36.7%                      | 36.2%      |
| Cereals and legumes           | 27.7%                                      | 71.4%                      | 0.9%       |
| Potatoes                      | 8.5%                                       | 13.5%                      | 77.9%      |
| Milk and dairy products       | 7.1%                                       | 49.0%                      | 43.9%      |
| Cattle and poultry (live weight) | 2.9%                                      | 75.9%                      | 21.1%      |
| Animal Hair and Hair          | 36.6%                                      | 16.4%                      | 47.0%      |
| Vegetables                    | 14.6%                                      | 18.9%                      | 66.5%      |
| Sugar beet                    | 11.7%                                      | 88.1%                      | 0.2%       |
| Sunflower                     | 30.4%                                      | 69.2%                      | 0.4%       |
| Total products at current prices | 12.1%                                      | 52.5%                      | 35.4%      |

In general, yields and livestock production in peasant farms are lower than in agricultural organizations (Table 5). The only exception is the yield of vegetable crops.

Table 5. The main indicators of crop and livestock production on average for the period 2012-2017 by categories of farms.

|                                | Peasant farms and individual entrepreneurs | Agricultural organizations | Households |
|--------------------------------|--------------------------------------------|----------------------------|------------|
| Crop yield, centner / hectare |                                            |                            |            |
| Grain and leguminous crops    | 22.1                                       | 26.4                       | 20.1       |
| Potatoes, total               | 189.7                                      | 224.6                      | 142.2      |
| Vegetables                    | 272.1                                      | 253.5                      | 210.7      |
| Sunflower                     | 13.4                                       | 16.2                       | 14.8       |
| Winter wheat                  | 32.1                                       | 36.5                       | -          |
| Sugar beet                    | 411.9                                      | 424.1                      | 350.5      |
| Main indicators of livestock (cattle) |                                          |                            |            |
| The average annual milk yield, liters per 1 cow | 3473.0 | 5106.0 | 3499.8 |
| Produced (grown) cattle (in live weight), a kilogram per head | 118.0 | 121.1 | 193.5 |

Relatively low yields are explained by the violation of technology fertilization farms. The volume of fertilizer applied in the fields is not recorded, but it is known that the pro-portions of the area fertilized with mineral fertilizers was 19.5% for peasant farms versus 33.0% for agricultural organizations and 2.1% and 6.0% for organic fertilizers. The equipment of peasant farms with machinery in terms of unit area is sufficient: 7 tractors and 2 combines per thousand hectares versus 4.5 and 1 in agricultural organizations. However, the farm has no more than 2 tractors and only half of the farms have combine harvesters, when an agricultural organization has an average of 10 tractors.
and 3 combines. The provision of manpower by the average annual number of people employed in agricultural production in 2015 on farms amounted to 11 people per thousand hectares of arable land, and in agricultural organizations there were 18 people in the same area. Despite the idea of family labor in peasant (farmer) farms in 2016, 44.9% of the total number of people employed in agricultural production was employed (26.1% on a permanent basis and 18.8% of temporary workers). Peasant farms are also characterized by a lower level of education of their managers. The majority of heads of agricultural organizations (82.0%) have a higher education, including 49.5% of agricultural orientation, and only 3% have only a certificate of secondary general education. In peasant farms, only a third of managers have higher education, a third - secondary vocational education and 24.0% did not receive education after graduation.

Most of the land of peasant (farmer) farms are used by entities that may be called family farms only formally. Large areas of 1,500 thousand hectares cannot be processed without hiring additional labor, and therefore it can be argued that most of their employees fall on these farms.

The study identifies a number of difficulties currently facing farming: low qualifications of farm managers, the problem of the affordability of fertilizers and the low viability of small land use. If the first is a global social problem in rural areas, and not farmers in particular, the rest depends on the degree of state participation in supporting the livelihoods of peasant (farm) farms.

According to the 2016 Census, 34.5% of farms in 2015 received subsidies (subsidies) from the state, and only 10.2% got loan funds from banks, when similar figures for agricultural organizations were 68.8% and 24.6%, respectively. It is not possible to compare these data with the presence of a large proportion of Peasant Farmers with extremely low land area (23.0% of farms have an agricultural land area of less than 10 hectares, i.e. at the level of personal subsidiary farms, and 19.9% generally have no land area).

The Joint Stock Company Federal Corporation for the Development of Small and Medium Enterprises (SME Corporation) prepared a report [30] on a set of measures to support agricultural cooperatives in general and personal subsidiary, peasant farms in particular. Most of the programs described are valid from 2018. These programs support small and medium enterprises in the field of agricultural activities contribute to the development of peasant farms, agricultural cooperation, their technical equipment, market access for their agricultural products, agro-industrial parks, etc. and offer many options for preferential loans for the implementation of the activities.

Beginning farmers are provided with grants (no more than 90% of the costs, 10% are farmers’ own funds) of 3 million rubles, with a grant period of 18 months for breeding beef and dairy cattle and 1.5 million rubles for other activities.

The grant is allocated for the development of a family livestock farm in the amount of 30 million rubles with a development period of 24 months for breeding cattle of meat or dairy areas. The size of the grant is not more than 60% of the costs, 40% is the own funds of the farmers, of which a part of the costs not more than 20% can be provided at the expense of the funds of the subject of the Russian Federation. For the development of other sub-sectors of animal husbandry, the size of the grant allocated under the same conditions amounts to 21.6 million rubles.

For the purchase of land plots from agricultural land for the purposes of organizing production, storage, and/or primary processing of agricultural products on them, a loan is granted only on the security of acquired land plots for a period of 8 years and a rate of up to 6.5% per annum (the program of preferential loans Government of the Russian Federation No. 1706 of December 30, 2017). Among other measures, farms allocate funds (both credit and leasing programs) for the purchase of new or used equipment, as well as young farm animals (including from foreign suppliers). For example, under the “Young Farmer AKKOR” Program, a lessee is provided for those being under 35 years and has been working in agriculture for 2 years or more. That person can receive up to 10 years at a rate of 3.5% of agricultural equipment and equipment for carrying out field work without advance payment and support. According to a special program for members of the Association of Peasant Farms and Agricultural Cooperatives of Russia (AKKOR), the lessees, members of AKKOR, can be received for
agricultural machinery and equipment for field work, as well as it covers animals and livestock equipment under the same conditions.

A wide range of different options for the preferential purchase of equipment explains the relatively high equipment of farmers with agricultural equipment, but it is not enough for the construction of a modern farm complex, since only a third of households used their own or rented production buildings in 2016.

Much attention is paid to the following measures: developing agricultural cooperation; purchasing products in personal (subsidiary) farms; organizing sales markets, holding fairs; creating regional online resources for the sale of products of local agricultural cooperatives; organizing the interaction with federal and regional retail networks to ensure access to agricultural cooperatives; consulting on measures of state support and assistance in the preparation of documents for funding; providing assistance in drawing up a business plan; conducting feasibility study the development of an agricultural development project etc.

In the 27 subjects of the Russian Federation for 2018-2020, regional programs for the development of agricultural cooperation have been drawn up. The local center of legislative initiatives was the regions of the Urals (Figure 2).

![Figure 2. Territories on which regional programs for the development of agricultural cooperation have been drawn up.](image)

To answer the question of how the farmers are doing in entities that already have support programs and in which entities state support is most needed, a study was conducted on changes in the area used by peasant farms to determine in which regions farms continue to develop and in which they don’t. The analyzed subjects are divided into regions with similar agroclimatic and socio-economic conditions of agricultural production (Table 6).

As can be seen in Figure 3, peasant farms are most prevalent in the southern and steppe parts of the country, rich in chernozem or suitable for distant-pasture livestock breeding. The exceptions are the Novosibirsk and Samara regions, the Stavropol territory and the entire Central Black Earth zone. There is a different picture with the growth of peasant farms over the past 5 years (Figure 4). In
relation to the indicator of 2012, the acreage of Peasant Farmers in the Volga Federal District and in parts of the regions of the Non-Chernozem zone increased more than 1.5 times.

Table 6. Data on peasant farms in the context of the subjects of the Russian Federation.

| Region                  | Thousan d ha | % of the whole | Absolute increase thousand ha | Absolute increase in% of all post | Growth rate, 2017 in% by 2012 | Peasant farms with a cultivated area of over 1,500 hectares | Agricultural organization with a total area of more than 6000 hectares |
|-------------------------|--------------|----------------|-------------------------------|----------------------------------|-------------------------------|-------------------------------------------------|---------------------------------------------------------------|
|                         | 1*           | 2              | 3                             | 4                               | 5                             | 6                                              | 7                                               | 8                                                   |
| Volgograd               | 1136.0       | 36.4%          | +250.2                        | +8.0%                            | 128%                          | 13.9%                                          | 37.7%                                          |
| Rostov                  | 1522.0       | 35.5%          | +284.9                        | +6.3%                            | 123%                          | 7.3%                                           | 36.2%                                          |
| Krasnodar               | 1117.5       | 30.2%          | +177.4                        | +4.8%                            | 119%                          | 4.8%                                           | 37.7%                                          |
| Crimea                  | 221.0        | 28.8%          | +124.5                        | +16.2%                           | 229%                          | 6.1%                                           | 16.8%                                          |
| Stavropol               | 666.3        | 21.4%          | +128.8                        | +4.1%                            | 124%                          | 3.6%                                           | 58.3%                                          |
| Astrakhan               | 52.7         | 67.3%          | +7.0                          | +8.9%                            | 115%                          | 0.0%                                           | 0.0%                                           |
| Kalmynwia               | 164.6        | 58.0%          | +82.2                         | +29.0%                           | 200%                          | 13.7%                                          | 2.3%                                           |
| Adygea                  | 132.5        | 57.1%          | +9.6                          | +4.1%                            | 108%                          | 3.3%                                           | 8.8%                                           |
| Kabardino-Balkar        | 148.2        | 51.3%          | +13.1                         | +4.5%                            | 110%                          | 2.8%                                           | 8.7%                                           |
| Karachay-Cherkess       | 64.2         | 50.1%          | +13.5                         | +10.5%                           | 127%                          | 3.6%                                           | 9.0%                                           |
| Ingushetia              | 25.3         | 42.0%          | -6.2                          | -10.2%                           | 80%                           | 0.0%                                           | 10.0%                                          |
| Chechen                 | 88.2         | 34.1%          | +40.3                         | +15.6%                           | 184%                          | 1.7%                                           | 4.1%                                           |
| North Ossetia-Alania    | 52.3         | 30.0%          | +6.2                          | +3.5%                            | 113%                          | 1.5%                                           | 5.1%                                           |
| Dagestan                | 49.0         | 13.4%          | +29.0                         | +7.9%                            | 245%                          | 0.0%                                           | 0.0%                                           |
| Voronezh                | 643.0        | 24.6%          | +93.5                         | +3.6%                            | 117%                          | 6.3%                                           | 34.6%                                          |
| Votmov                  | 425.6        | 24.1%          | +63.9                         | +3.6%                            | 118%                          | 7.5%                                           | 34.0%                                          |
| Oryol                   | 251.0        | 19.7%          | +69.8                         | +5.5%                            | 139%                          | 3.5%                                           | 51.9%                                          |
| Kursk region            | 301.1        | 18.2%          | +65.5                         | +4.0%                            | 128%                          | 6.6%                                           | 54.9%                                          |
| Lipetsk                 | 241.6        | 17.9%          | +70.0                         | +5.2%                            | 141%                          | 6.2%                                           | 50.3%                                          |
| Belgorod                | 219.9        | 15.3%          | +52.5                         | +3.7%                            | 131%                          | 3.6%                                           | 64.4%                                          |
| Saratov                 | 1878.3       | 49.0%          | +159.3                        | +4.2%                            | 109%                          | 27.2%                                          | 28.3%                                          |
| Orenburg                | 1752.2       | 41.4%          | +604.1                        | +14.3%                           | 153%                          | 21.2%                                          | 41.4%                                          |
| Chekymbinsk             | 766.3        | 40.2%          | +303.4                        | +15.9%                           | 166%                          | 16.5%                                          | 41.9%                                          |
| Kurgan                  | 499.7        | 36.1%          | +129.3                        | +9.3%                            | 135%                          | 18.4%                                          | 28.5%                                          |
| Bashkortostan           | 910.1        | 30.3%          | +327.5                        | +10.9%                           | 156%                          | 8.7%                                           | 29.3%                                          |
| Samara                  | 550.9        | 26.9%          | +186.4                        | +9.1%                            | 151%                          | 11.8%                                          | 38.0%                                          |
| Ulyanovsk               | 257.0        | 24.9%          | +73.7                         | +7.1%                            | 140%                          | 9.9%                                           | 33.1%                                          |
| Penza                   | 340.8        | 24.7%          | +124.6                        | +9.0%                            | 158%                          | 9.3%                                           | 38.2%                                          |
| Tatarstan               | 527.8        | 17.5%          | +159.5                        | +5.3%                            | 143%                          | 4.8%                                           | 53.4%                                          |
| Altai Rep               | 50.1         | 47.6%          | +10.7                         | +10.1%                           | 127%                          | 0.0%                                           | 0.0%                                           |
| Khakassia               | 106.5        | 44.7%          | +19.9                         | +8.4%                            | 123%                          | 11.1%                                          | 34.4%                                          |
| Omsk                    | 1265.3       | 41.8%          | +263.9                        | +8.7%                            | 126%                          | 23.7%                                          | 40.2%                                          |
| Altai krai              | 2153.1       | 39.7%          | +513.2                        | +9.5%                            | 131%                          | 24.2%                                          | 36.9%                                          |
| Kemerovo                | 342.6        | 35.9%          | +9.2                          | +1.0%                            | 103%                          | 18.5%                                          | 29.4%                                          |
| Tomsk                   | 94.8         | 26.2%          | +29.7                         | +8.2%                            | 146%                          | 14.4%                                          | 40.8%                                          |
| Novosibirsk             | 592.2        | 24.8%          | +172.7                        | +7.2%                            | 141%                          | 10.0%                                          | 40.9%                                          |
| Tyumen                  | 191.3        | 17.7%          | +7.1                          | +0.7%                            | 104%                          | 7.8%                                           | 51.6%                                          |
| Magadan                 | 6.4          | 84.2%          | +3.1                          | +40.7%                           | 194%                          | 54.1%                                          | 0.0%                                           |
| Jewish AR               | 80.1         | 53.8%          | +16.3                         | +10.9%                           | 125%                          | 16.8%                                          | 0.0%                                           |
| Amur                    | 446.7        | 35.4%          | +139.5                        | +11.1%                           | 145%                          | 20.7%                                          | 49.7%                                          |
| Region                | Population | Increase | Increase % | Previous Population | Increase % | Previous Population | Increase % | Increase % |
|-----------------------|------------|----------|------------|---------------------|------------|---------------------|------------|-----------|
| Primorsk              | 154.6      | 32.6%    | +67.7      | 118%                | 14.3%      | 178%                | 12.8%      |
| Sakhalin              | 6.9        | 22.6%    | +3.4       | 96.6                | 11.1%      | 196%                | 0.0%       |
| Kamchatka             | 4.2        | 19.4%    | +1.1       | 134%                | 4.9%       | 134%                | 0.0%       |
| Khabarovsk            | 15.0       | 17.8%    | +7.7       | 206%                | 9.1%       | 206%                | 0.0%       |
| Chuvash               | 145.8      | 26.3%    | +5.8       | 162%                | 10.0%      | 162%                | 5.9%       |
| Sverdlovsk            | 171.0      | 20.5%    | +26.7      | 119%                | 3.2%       | 119%                | 4.9%       |
| Nizhny Novgorod       | 174.0      | 15.2%    | +69.1      | 166%                | 6.0%       | 166%                | 3.5%       |
| Perm                  | 112.1      | 14.5%    | +68.6      | 258%                | 8.9%       | 258%                | 1.9%       |
| Udmurt                | 143.2      | 13.9%    | +34.5      | 132%                | 3.4%       | 132%                | 3.3%       |
| Mordovia              | 91.0       | 12.2%    | +11.9      | 115%                | 1.6%       | 115%                | 5.7%       |
| Mari El               | 35.7       | 12.1%    | +17.0      | 191%                | 5.8%       | 191%                | 9.9%       |
| Kirov                 | 53.7       | 6.3%     | +19.8      | 158%                | 2.3%       | 158%                | 1.8%       |
| Tula                  | 189.2      | 21.7%    | +54.8      | 141%                | 6.3%       | 141%                | 8.6%       |
| Bryansk               | 154.1      | 17.6%    | +46.3      | 143%                | 5.3%       | 143%                | 6.6%       |
| Smolensk              | 65.7       | 16.4%    | +15.8      | 132%                | 3.9%       | 132%                | 2.8%       |
| Ivanovo               | 35.6       | 16.1%    | +11.9      | 150%                | 5.4%       | 150%                | 3.4%       |
| Novgorod              | 27.6       | 15.4%    | +8.6       | 145%                | 4.8%       | 145%                | 2.2%       |
| Kaluga                | 51.5       | 14.8%    | +33.6      | 288%                | 9.7%       | 288%                | 9.7%       |
| Ryazan                | 134.4      | 14.7%    | +37.3      | 138%                | 4.1%       | 138%                | 6.3%       |
| Kostroma              | 27.0       | 14.1%    | +19.2      | 346%                | 10.0%      | 346%                | 1.1%       |
| Kaliningrad           | 29.5       | 11.8%    | +5.2       | 121%                | 2.1%       | 121%                | 2.1%       |
| Vologda               | 41.5       | 11.4%    | +12.2      | 142%                | 3.4%       | 142%                | 4.7%       |
| Tver                  | 55.3       | 10.3%    | +7.0       | 114%                | 1.3%       | 114%                | 0.7%       |
| Pskov                 | 22.2       | 9.0%     | +13.0      | 242%                | 5.3%       | 242%                | 0.9%       |
| Moscow                | 52.8       | 8.6%     | +32.3      | 257%                | 5.3%       | 257%                | 1.4%       |
| Leningrad             | 17.0       | 7.1%     | +9.9       | 240%                | 4.1%       | 240%                | 0.8%       |
| Vladimír              | 21.4       | 6.5%     | +13.0      | 254%                | 4.0%       | 254%                | 0.0%       |
| Jaroslavl             | 14.8       | 4.7%     | +6.8       | 185%                | 2.1%       | 185%                | 0.0%       |
| Khanty-Mansi          | 2.1        | 25.2%    | +0.5       | 129%                | 5.6%       | 129%                | 0.0%       |
| Arhangelsk            | 17.6       | 24.1%    | +3.8       | 128%                | 5.3%       | 128%                | 2.7%       |
| Murmansk              | 0.8        | 11.7%    | +0.5       | 277%                | 7.5%       | 277%                | 0.0%       |
| Komi                  | 4.0        | 10.1%    | +1.7       | 173%                | 4.3%       | 173%                | 0.0%       |
| Karelia               | 1.3        | 3.8%     | +0.4       | 139%                | 1.1%       | 139%                | 0.0%       |
| Irkutsk               | 311.3      | 44.8%    | +126.3     | 168%                | 18.2%      | 168%                | 12.6%      |
| Tyva                  | 14.3       | 41.6%    | +9.9       | 325%                | 28.8%      | 325%                | 0.0%       |
| Sakha (Yakutia)       | 13.6       | 28.3%    | +5.3       | 164%                | 11.1%      | 164%                | 0.0%       |
| Transbaikal           | 40.9       | 20.3%    | +10.7      | 135%                | 5.3%       | 135%                | 3.0%       |
| Buryatia              | 28.2       | 19.4%    | +11.0      | 164%                | 7.6%       | 164%                | 4.3%       |
| Krasnoyarsk           | 260.9      | 16.9%    | +113.1     | 176%                | 7.3%       | 176%                | 3.8%       |

* Regions of Russia
Figure 3. Share of acreage of peasant farms and individual entrepreneurs in the total acreage of regions of the Russian Federation.

Figure 4. Growth rates of sown areas of peasant (farmer) farms and individual entrepreneurs by subjects of the Russian Federation, 2017-2012.

The farming culture is observed mainly by farmers of the Central Black Earth region and Southern Russia, where more than 60% of the sown area was under mineral fertilizers from peasant (farmer) farms and individual entrepreneurs (Figure 5).
4. Discussion
Analyzing the data obtained, it is possible to single out the subjects in which the farm sector is developing the most and least actively relative to other regions with similar agroclimatic and socio-economic conditions. For this, all subjects were divided into groups (see table 2):

1) The South
In the South of the country, there is a relatively high proportion of farmers’ holdings (almost a third of the region’s sown area, and more than half for the steppe zone), with the moderate growth (1-2% of the total sown area per year). The lowest rates are in the Stavropol region, where the conflict for the right to use the land between the large landowners and local farmers is most acute. The Regional Program for the Development of Agricultural Cooperation is in place only in the Krasnodar region.

2) Caucasus
This territory is characterized by a high proportion (30% or more) of small farms and personal subsidiary farms (in the Republic of Dagestan) due to the special traditions of the peoples living in this region. The change of sown areas of peasant farms in the group’s subjects is characterized by noticeable leaps, most pronounced in the Republic of Ingushetia: the sown areas were 29.3 thousand hectares in 2002, 14.4 in 2007, 39.9 in 2011, and 25.3 as of today.

3) The Central Black Earth region
In the Central Black Earth region, there is some contrast between, on the one hand, the Voronezh and Tambov regions, where the share of farmers is almost a quarter of the sown area (and a third of the crops are large agricultural organizations). However, there has been no active growth over the past 5 years. On the other hand, the Belgorod, Lipetsk, Oryol and Kursk regions demonstrate other results: the share of peasant farmers in crops is less than 20%, and the share of large organizations is more than 50%. In the Belgorod region, the situation is similar (for the worse) to the Stavropol region – only 15% of arable land is used by farmers and the largest concentration of large landowners in the country. But since 2015, the Departmental Target Program “On the Development of Agricultural Cooperation...
in the Belgorod Region for 2015-2020” has been operating in the region. However, its growth has not yet been significantly reflected in the growth of agricultural land.

4) South Volga and the Urals

First of all, in this area, it is worth highlighting the Saratov and Orenburg regions, where the largest (after the Altai region) total areas of crops of peasant farms and individual entrepreneurs (1.9 and 1.8 million hectares, respectively, which exceeds 40% each subject). At the same time, in these regions, the highest proportion of large farms is with a cultivated area of more than 1,500 hectares per farm (27 and 21% of the total sown area, respectively). A high proportion of farmers is in the Chelyabinsk and Kurgan regions (40 and 36%, respectively). The most active growth of the last 5 years has been happening in the Orenburg and Chelyabinsk regions, largely due to the expansion of the areas of large farmers.

The worst indicators in the Republic of Tatarstan, similarly with the Belgorod region and the Stavropol Territory, the proportion of farmers' crops is 18%, and the large organization is more than 50%, and for the last 5 years there has been a relatively low growth of farms. But the region has launched an action program for the development of agricultural consumer cooperation for the period 2017–2020, and in 2017 the sown area of farms increased significantly more than the average in the previous 4 years (47 thousand hectares in 2017 against an average of 28 thousand ha in the period 2012-2016).

5) The Trans Urals

The main attractors for farmers in this region are the Altai region and the Omsk region. As noted above, the Altai region occupies the first line in terms of the size of the sown areas of peasant farms (2.2 million hectares). In both regions, 40% of the crops are owned by farmers, but at the same time 24% of the total sown area is large (from 1500 hectares of sown area to the farm). The neighboring no-Siberian region comes into contrast, where only 25% of the acreage is owned by peasant farms, but the growth rate of their area over the past 5 years is comparable to the leading regions.

The worst indicators are in the northern Tyumen region, demonstrating 18% of the crops produced by farmers and more than 50% by large agricultural organizations. Of the regional initiatives, there is only the Concept of the Development of Cooperation until 2020. On the contrary, the situation is slightly better in the Tomsk region. There has been a regional program of support for agricultural cooperation since 2009, which affects the relatively active growth of the area for farmers in the area, while the agro-climatic conditions for farming in the Tomsk region are inferior to those of Tyumen.

6) Far East

The agricultural part of the Far Eastern region (Amur region, Primorsky krai, and the Jewish Autonomous Oblast) is characterized by both a high proportion of farms (more than a third of the acreage) and an active rate of their growth over the last 5 years (2-3% of the total sown area per year). The trend is quite natural, taking into account the amount of attention paid by the state to the region in recent years.

7) Black Earth (Zernozemye), the North of the Volga region and the Urals

The agricultural region of the country with the least attractiveness for farmers is characterized by a generally declining agricultural sector. In most regions, the share of sown areas of peasant farms and individual entrepreneurs is below 20% (there are also few large agricultural organizations, on average, 20% of the sown area). The active development of farming in the region began only the last 5-10 years, and these are small and medium-sized farms for the most part (50-1500 hectares).

The largest share of the acreage is used by farmers in the Tula (22%) and Bryansk (18%) regions in the west and the Chuvash Republic (26%) and the Sverdlovsk region (21%) in the east. Despite the absence of special regional programs for the development of farms and agricultural cooperation, the highest growth of peasant farmers and individual entrepreneurs was registered in the Chuvash Republic, Kostroma, and Kaluga regions (the share of the cultivated area of farmers in the regions increased by 10% over the last 5 years).

The worst situation is observed in the Yaroslavl and Kirov regions. The share of sown areas is 5 and 6%, respectively. And the total sown area of farmers is lower than it was in the 90s and early
2000s. The development of support programs for farms and agricultural cooperation is only at the concept stage.

8) The North and Siberia

Here it is worth paying attention to two neighboring regions: the Irkutsk region and the Krasnoyarsk region. In the first, almost half (45%) of the cultivated area is used by farms, and only 17% is used in the Krasnoyarsk territory (and the share of large organizations is 57%). However, in both subjects, farming has been developing quite actively in the past 5 years (the growth rate from 2012 to 2017 was approximately 70%).

In the rest of Siberia, fodder predominates in the structure of agricultural land and livestock farming constitute the main direction of agricultural production. The lower proportion of farms is noticeable in comparison to, for example, the Republic of Kalmykia. According to the Census data, the share of forage lands used by farmers is high only in Yakutia (36%), where the Departmental program “Development of Cooperation and Small Business Forms in the Republic of Sakha (Yakutia) for 2017-2020” operates. In other subjects, it does not exceed 15%. In the regions of the Far North, the plant industry is practically not represented.

As the analysis showed, a significant contribution to the development of farming in the country, in addition to agro-climatic conditions, is made by supporting the development of agricultural cooperation and farming in the region, as well as finding a compromise between the interests of large landowners and the local population. Examples are given when in the neighboring regions, there is a pronounced contrast between the level of farming development (Omsk and Novosibirsk, Yaroslavl and Kostroma regions, Stavropol and Krasnodar regions, etc.). There are regions where large landowners can inhibit the development of farms (Belgorod region, Stavropol region, Krasnoyarsk region, Kursk region, the Republic of Tatarstan, Oryol region) and where a large proportion of large land uses have not prevented the development of peasant farmers and individual entrepreneurs (Chelyabinsk region, Orenburg region, Omsk region, Volgograd region, Krasnodar region, Altai region, Rostov region).

The least degree of farming was developed in the non-chernozem zone, where the configuration of land areas is more conducive to the creation of a large number of farms of medium and small size. The high proportion of unused land in the area, their suitability for organic farming, dairy farming as the most promising areas of agricultural development in Russia today, and more suitable for personal family labor, suggests the prospects for the development of peasant farming and individual entrepreneurship in the region. But the lack of regional programs in support of agricultural cooperation and small business development in these regions (as well as the lack of legal regulation of organic farming) does not currently allow using the entire land potential of these territories. It is proposed to develop a unified program for the development of agricultural cooperation, peasant farms, and other forms of small business in agriculture throughout the non-chernozem zone, and also to develop support for the diversification of farmers’ economic activities, as is done worldwide [21-24].

Recently, Russia has been characterized by a steady trend of population concentration in large metropolitan areas. The outflow of rural residents to large cities with a population of over one million and especially the capital, where it is easier to find work and better living conditions, many times more favorable conditions of medical and cultural services, receiving and improving education, access to other elements of a civilized environment that determine the quality of life. The main factor in the attraction of the rural population is the place of employment, i.e. where the wages are higher, the able-bodied population seeks, especially the younger age [25, 32].

The shredding and reduction of the number of rural settlements continues. According to the 2010 All-Russian census, out of 153 thousand settlements, 19.5 thousand (12.7%) exist only on paper.

Without providing employment in agriculture, as well as traditional activities and economic land use characteristic of a particular rural territory, ensuring year-round transport links of rural populated areas with centers of municipal formations provided with education, health care, and recreational facilities, rural areas are doomed extinction. Local government cannot afford supporting the degraded villages and villages.
A spatial development strategy for the country [31] is currently being developed [28], which is based on the urbanization of territories based on 35-40 large agglomerations. The development of rural areas is carried out on the basis of territorial planning documents (territorial planning schemes of municipal districts and general plans of settlements). But in these documents, there is no special section devoted to the development of agriculture, which is the main factor in the livelihood of the rural population and the formation of resettlement in rural areas. There is no answer to the common questions in the non-chernozem and other depressed rural areas: how to improve the life of villages where there are almost no inhabitants, and the depreciation of the remaining houses exceeds 80%. In addition, such places, as a rule, have no year-round transport accessibility, or the remaining residents should be relocated to larger settlements. Then another question arises: how to organize agricultural production in these territories?

To address these issues, it is necessary to develop the “Spatial Development Scheme for the Agro-Industrial Complex of Rural Territories”, in which special attention should be paid to ensuring the viability of the rural population in these territories.

5. Conclusion

The study showed a significant contrast in the development of farming among different regions of Russia in the same agro-climatic conditions. The main reason for this phenomenon is the different approach of the authorities to the management of the agricultural sector of the regional economy and its social development (in most cases, the presence or absence of regional support for small business in agriculture). But in general, the favorable agro-climatic conditions remain the key factor that attracts peasant farms and individual entrepreneurs to agricultural production. However, in a large part of the regions with such conditions (in the Stavropol Territory, Central Black Earth Zone), there is a significant proportion of large agricultural organizations which monopolistic influence on the local food market hinders the development of farming. Among other factors hindering the development of peasant farms in Russia, the following should be highlighted: the lack of access to additional funds; low qualification of the labor force, including heads of farms; the presence of fictitious peasant farms without land area and farms with an area comparable to large agricultural organizations, which makes it difficult to identify them as a family farm. The most important and effective tools for solving problems are the development of regional programs to support the development and diversification of economic activities of farms, as well as the improvement of the territorial planning procedure for the development of the agro-industrial complex of rural areas, including under the guidance of the land management service, taking into account the interests of the local population.

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