

Development of the Concept of Rational Use of Land on the Example of the Penza Region

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Abstract. The article is devoted to the study of the rational use of land, which is exacerbated in connection with the conditions of the diversity of forms of ownership and management on land. Many lands are not used for their intended purpose and the disposal of land from agricultural circulation, as well as due to erosion, waterlogging and other factors, leads to a decrease in the level of land provision of the population. In recent years, the amount of organic and mineral fertilizers introduced into the soil has decreased. Improving the condition of land and increasing the efficiency of their use is a large complex task that requires significant investment, both from the state and from specific land users. The research hypothesis - land management processes are also developing from the classical approach, focused on forest belts, tin ravines, improvement of crop rotation and similar events, modern enterprises partially depart in two directions - either using business planning or using the postulates of strategic management. The authors developed recommendations to improve the efficiency of agricultural land use in the Penza region.

1. Introduction

Land resources - the main, main and specific natural resource for farming, as: they are a product of nature; geographically limited and irreproducible; irreplaceable; have a permanent location; heterogeneous in quality; when used correctly, they do not wear out, but increase their fertility (natural, artificial and economic). Agricultural land is land that is systematically used to produce agricultural products and includes arable, fallow, meadow, and land under permanent crops. The subject of this study is the process of developing the concept of rational use of land in the Penza region. The purpose of the study is to evaluate various approaches to the process of rationalizing land use, in particular, on the basis of scientifically sound rational use of agricultural land, properly selected crops and crop rotation, the use of a business plan and farm development strategy.



2. The problem in practice

When solving the problem of rationalizing the use of land, the simplest and most developed approach to solving the problem is sectoral at the regional administration level. At the federal and regional levels, it is not possible to completely plunge into the problems of individual small farms, and the village councils and, especially, rural settlements have practically no free budget funds. We predict the behavior of the district administration on the example of the Bessonovsky district of the Penza region, which is typical of the region, and the region itself is typical of the entire Russian Federation.

Bessonovsky district belongs to the Eastern industrial zone of the Penza region, where the main mineral resources of the Penza region are concentrated, represented by both explored reserves, recorded and unaccounted for balances, and forecast resources. Concentrated here 100% of industrial categories of silicate, glass and molding sands, refractory clays, raw materials for cement and lime production: 97% - building stone, 95.2% - expanded clay and 71.5% - brick clays. Important components of the investment potential of the region are clay deposits for the production of ceramic products. The content of physical clay in clay and heavy loamy rocks is 45.9 - 66.6%. Clay reserves are not limited. Their volumes are able to ensure the stable operation of the enterprises of the construction complex at maximum capacity utilization [1].

The economic and geographical position of the district is characterized by the presence of federal roads "M-5-" Ural ". The climate in the Bessonovsky district is temperate continental. The average temperature in summer is +21°C, in winter -12°C. The average height of the snow cover is 34 cm, and the depth of freezing of the soil is 82 cm. The length of the period with stable snow cover is 148 days. The average annual rainfall is 549 mm. The growing season is 174 days. The prevailing wind direction in summer is west and southwest, in winter - southwest and south, winds of winds are southeast, the average number of days with dry winds is 27.6, the duration of dry winds is from May to August.

According to the temperature conditions of moisture supply, land use of the economy belongs to the I agroclimatic region, a subdistrict of sufficient moisture, with a hydrothermal coefficient I, 0 - I, I. Most of the territory of the district is occupied by agricultural land, which accounts for 61.2% (74.7 thousand hectares) of the total area of the district. Arable lands prevail within the agrolandscapes, accounting for 46.5% of the total area and 76% of the agricultural land. The area is rich in fertile humus soils that are of the greatest value for agriculture; more than 72.2% of cultivated land is concentrated on them, it was revealed that more than half of the lands of the Bessonovsky region are occupied by agricultural lands (61.2%), forests are also located on a large territory (25.1%), the lands of settlements account for 7.2% of the total territory and almost 3% It is occupied by the lands of industry, transport and energy, the remaining categories of land are located on less than 1% of the district's land [2].

One of the main characteristics of the soil is fertility. Showing the probable possibility of efficient use of agricultural land is characteristic of the upper layer of the earth - the soil. It acts as an important factor in expedient production, is a quality feature of the soil. Artificial fertility appears as a result of the interaction of natural fertility and human exposure to soil. According to the natural-agricultural zoning of the land fund of the Russian Federation, the territory of the region belongs to the forest-steppe zone of the Central Russian soil-geographical province, to the leached humus subzone. The soil cover of the region is relatively uniform and is represented mainly by humus type soils. The following soil types were identified in the district: gray forest soils, humus and meadow humus soils. Gray forest soils are represented by three subtypes: light gray, gray, dark gray. Humus are represented by podzolized and leached. Meadow- humus soils took shape in lowered relief elements with a high level of groundwater occurrence [3].

Thus, the prevalence of humus type soils, a rather good value of the bonitet score and the climatic conditions of the region when applying a certain set of agrotechnical, reclamation, hydrotechnical and other measures aimed at the maximum conservation and rational use of moisture, are favorable for obtaining high and stable yields of all crops.

The main part of the agricultural land of the region is arable land (75.4%) and pastures (18.9%). Perennial plantations and hayfields occupy a total of about 6% of the territory. The main part of the

region's land has a flat character and continental climate, which is not suitable for growing fruits that are not economically feasible to grow. The basis of the district is not vineyards and vegetable gardens, but traditional cultures for the Penza region: winter and spring wheat, barley, oats, sunflower, perennial and annual grasses, so arable land prevails over other types of agricultural land. In addition to crop production, animal husbandry is developing quite effectively, yet, pastures occupy the second place in the area of land in the region. The Bessonovsky region is characterized by a large number of ravines, so it can be argued that the area of perennial plantings is insufficient [4].

There is a gradual decrease in the sown area of crops: winter wheat, barley, oats, peas. A decrease in winter wheat sowing is impractical, since winter wheat exceeds fertility in spring, under noble climatic conditions, about 40 centners per hectare can be obtained, while in spring this figure will be about 30 centners per hectare. Barley, oats and peas are the main and important crops in cereal (concentrated) animal feeds. Although, for example, voluminous (succulent and coarse) feeds are the basis of cattle diets, the value of concentrated feeds is very high: they are necessary for balancing rations for the most important nutrients. The decrease in crops of grain and leguminous crops used for feed in animal husbandry may be due to their excess. Therefore, it is more rational to reduce crops, but not to exclude them, and to grow other crops on the liberated lands [5].

The unstable trend of changes in the yield of grain and leguminous crops, which largely develops under the influence of climatic conditions, as well as fluctuations in the size of crops caused significant differences in the volume of grain produced in the region over the years. At the same time, in 2019 a low harvest guaranteed an increase in product prices, and next year many peasant farms invested in the cultivation of grain and leguminous crops, as a result of which the market felt an excess, and the prices for these crops predictably fell. Therefore, the crops of these crops are declining in 2017 [6]. To avoid this and compensate for the negative impact of inefficient agricultural producers on the industry, state regulation of the agricultural market is necessary, and state support and counseling of agronomists in relation to the peasant farms themselves. State regulation should not only consist in the legal provision of regulation, the formation of a competitive environment and the fight against the process of monopolization in the agricultural sector, but should also pay special attention to ensuring proportionality in the development of agricultural sectors. To this end, the balancing of the entire agro-industrial complex is carried out. A possible result would be the balance of agricultural production volumes with the material and technical equipment of agriculture, agricultural processing volumes, processing industry capacities, capital investments for the development of agricultural sectors. To determine the volume and structure of needs for agricultural products, the recommended rational norms of consumption of food products and non-food products per capita are used [7].

3. Conclusion

The authors have developed recommendations to improve the efficiency of agricultural land use in the Bessonovsky region:

- introduction of unused lands;
- strengthening slopes and preventing the further growth of two very intensively developing ravines near the settlements of Ukhtinka and Kropotovo with afforestation;
- planting of forest strips in some sections along the roads of Grabovo-Chertkovo and Poleologovo-Blokhino;
- purchase of the Agromash-180TK universal tractor and the Nova S340 combine harvester under the leasing program;
- the creation of an operational group of equipment with the possibility of renting it out for short periods to agricultural producers of the Bessonovsky region;
- it is recommended to hire an agronomist to consult with agricultural producers who want to improve the fertilizer application system;
- draw up an agreement on cooperation with the poultry farm, on the supply of livelihoods of birds, and their further use in the form of organic fertilizers in the fields of the district;
- the use of aircraft chemical work by several farms in cooperation with the Sosnovka airfield;

- participation in agricultural exhibitions and fairs, thereby attracting investors;
- association of active agricultural producers of the region, creation of an agricultural holding;
- restoration of a unique variety of Bessonovsky onions.

4. References

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