

# The state of agricultural lands in the Republic of Tyva (Russia)

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**Abstract.** The paper analyzes the impact of the development of the Republic of Tyva on changes in agricultural land and arable land area. It is shown that despite the fact that animal husbandry was the leading branch of agriculture in the Tuvan People's Republic (1921-1944), crop production developed no less dynamically, the acreage in 1944 increased 4.3 times over 17 years. During the period of the Tuvan Autonomous Region (1945-1960), the area of agricultural land and cultivated forage lands increased by an order of magnitude. But the unjustified plowing of virgin and fallow lands in the 50s and 60s of the twentieth century led to erosion and destruction of soils, to the loss of more than a million hectares of agricultural land. During the period of the Tuvan ASSR (1961-1991), further growth of agricultural land and acreage was observed. At the same time, the largest area of grain crops was observed in 1980. Since the beginning of market reforms (1991), there has been a sharp decline in agricultural land and the area of sown crops. Currently, there is a positive trend in the development of the agricultural sector of the republic with a slight increase in agricultural land and acreage, but not reaching the 1980 crop.

## 1 Introduction

Agricultural lands are a unique natural resource, the development of the agro–food market, food and economic security of the region, labor and settlement potential of rural areas depend on the state and rational use of which. Agriculture is the leading system-forming sphere of the republic's economy, the basis of which is agricultural land [1].

According to the land legislation, agricultural lands are understood as territories that are located outside the borders of settlements and that are intended for agricultural needs.

The Republic of Tyva is one of the most important agricultural regions of Russia, where animal husbandry is the defining industry. Farms here have extensive areas of various types of forage lands, which makes it possible to make extensive use of year-round grazing livestock. The main advantages of natural forage lands are a diverse species composition of herbs with a set of all the elements necessary for animal nutrition, free maintenance of animals, as well as minimal economic costs. The territory of the republic includes zones of various climates, topography and soils. This has led to a variety of landscapes, soil and vegetation cover, ranging from desolate steppes to alpine meadows.

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One of the urgent tasks is to increase the production and turnover of agricultural products not only on the territory of the republic, but also abroad. The solution to this problem depends on the effective and proper use of agricultural land, since land, as a resource, is depleted when used improperly, and large expenditures are required to restore its fertility [2].

## 2 Materials and methods

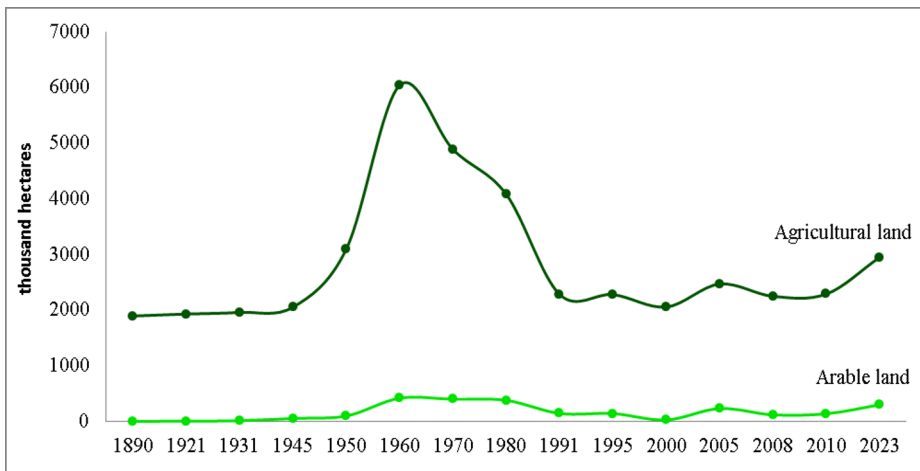
The objects of the study are agricultural lands in the intermountain basins of Tuva.

Tuva is located in the central part of Asia between 50-56 °N and 89-99 °E. From an orographic point of view, the Tuvan landscape region of the Altai-Sayan mountainous country has clearly defined borders that separate the mountainous part from the low mountains and foothill depressions. A characteristic feature of the relief is the presence of high ridges and highlands located on its outskirts and intermountain basins.

Literary, stock and statistical materials were used to analyze the structure and dynamics of acreage and farmland in the administrative regions of the republic.

## 3 Results and Discussions

In order to comprehensively study the state of modern agricultural land use in the Republic of Tyva, we will analyze the dynamics of changes in the area of agricultural land for the period from 1890 to 2023. (Figure 1) [3].



**Fig. 1.** Dynamics of agricultural land and arable land area of the Republic of Tyva from 1890 to 2023, thousand hectares.

The characteristic features and peculiarities of the Tuvan economy in the pre-Soviet period were traditional nomadic cattle breeding, maximally adapted to local natural conditions. Along with animal husbandry, Tuvans were also engaged in agriculture, which was a subsidiary occupation. So, since 1890, small areas (about 3 thousand hectares) of irrigated arable land have been created in the river valleys of the Yenisei and Khemchik. No more than 25% of peasant (Arat) farms were engaged in agriculture, located mainly in the Ulugh-Khem and Khemchik depressions. The cultivation of crops was extremely primitive and at the beginning of the XX century only 3.5 thousand hectares of land were

sown. In the spring, the arats (peasants) carried out watering, loosened the ground with a wooden plough, scattered the seeds and then sealed them with a Caragana travois [3].

During the period of the Tuvan People's Republic (1921-1944), animal husbandry was also the leading branch of agriculture. The number of livestock increased significantly and, according to 1945 data, amounted to 759 thousand heads, including 542 thousand heads of sheep and goats, 129.8 thousand heads of cattle, 61.7 thousand heads of horses, 25 thousand heads belonged to others (yaks, camels, deer, pigs).

In 1950-1960, the development of virgin lands in the country began, which did not bypass Tuva either. Of course, the development of virgin lands was an erroneous course in agriculture, imposed by party ideology, recognized as such a little later. Nevertheless, it should be noted that there are erroneous works concerning the development of agriculture in the republic in the 60s of the twentieth century. Some authors reported that plowing of virgin and fallow lands should be considered significant achievements of agriculture in Tuva, while the volume of agricultural land was increased 1.4 times, plowed in turnover 4.2 times, 4.7 times. In addition, the authors pointed out the need to use corn as the main fodder crop [4, 5].

More than a million hectares of agricultural land were lost during the virgin land period (1953 to the 1960s), decreased from 5.622 thousand hectares to 4.489 thousand hectares. In later studies, it was shown that the main factors of wind erosion in Tuva included the unjustified expansion of sown and forage crops, especially corn, the predominance of spring plowing and the use of seed varieties that should not be used in arid climatic conditions. Moreover, it was found that in areas of insufficient moisture, all types of soils are susceptible to wind erosion, "... in sandy and sandy loam soils, erosion begins 2-3 years after the development of virgin land, in light loam and medium loam – 4-5 years, and in clay and heavy loam after 7-10 years" [6]. Thus, the campaign to develop virgin lands in the country between 1954 and 1963 had a particularly strong impact on vegetation and soils, and significant anthropogenic impact in the steppes will be traced for several centuries. Almost simultaneously with the beginning of large-scale agricultural use of virgin and fallow lands, soil degradation and climate change occur [7].

By 1980, there was mainly an increase in grain and fodder crops. During this decade, 1972 was the most productive year – the gross harvest of grain crops amounted to 298.1 thousand tons. Thus, the 1970-1980 years in the agriculture of the republic were years of intensification, specialization and concentration of production, widespread introduction of economic calculation and other production methods. However, from 1976 to 1980, there was a tendency to decrease the pace of agricultural development in the republic. The main reason for the relatively slow development of the industry was a decrease in the yield of the main crops: grain, potatoes and vegetables. The reasons were both socio-economic and unfavorable weather and climatic conditions.

The relatively low starting conditions in which the economy of Tuva was located in the pre-reform period, management errors during the planning period, disruption of production and technological links of most enterprises and many other factors led to a catastrophic reduction of agricultural land and acreage in the period from 1980 to 1990. The reduction of grain acreage in 1990 by 1980 amounted to about 40%, including grain by more than two times.

As a result of the systemic crisis that engulfed Russia in the late 1980s and early 1990s, huge tracts of arable land were withdrawn from circulation [8]. During the period of reforms in the 1990s, negative trends in the country's economy had a more acute impact on the socio-economic development of the Republic of Tyva, given the complex of unresolved social problems, as well as the relative transport isolation of the republic, which is the only region in Russia that does not have a railway connection with the rest of the country. Factors such as disruption of economic ties between agricultural enterprises, processing and

marketing enterprises, lack of state support, disassembly of machine and tractor fleets, as well as their rapid deterioration, disparity in prices for agricultural machinery compared with prices for agricultural products, lack of tax incentives and preferential loans led to the ruin of large farms of the agro-industrial complex, the share of which accounted for more than 99% of agricultural products [9, 10].

Currently, Tuva lags behind most regions of the Siberian Federal District and Russia in many socio-economic parameters. However, there is a positive trend in the development of the agricultural sector of the republic with a slight increase in acreage, but not reaching the 1980 crop.

Based on the above data, it can be seen that during the analyzed period, the area of agricultural land has significantly decreased. The reason for the changes in the area of agricultural land is the transfer to reserve lands, for settlements and industrial facilities. However, these data do not give a complete picture of the nature of land use, since official statistics are based only on data from the Unified State Register of Real Estate.

Recently, an integrated approach has been developing on the territory of the republic for the development of agriculture, in particular to stimulate agricultural land use, and financial support has been provided by the state and the government of the Republic of Tuva to agricultural producers [11]. Nevertheless, despite the assistance provided, there are certain difficulties and questions.

At the moment, the bulk of unresolved issues of agricultural land use are related to the changes that occurred in the 1990s as a result of land reforms. Namely, the return of private ownership of land, the involvement of agricultural land in civil circulation and the granting of economic independence to state farms and collective farms led to numerous purchases of agricultural land by citizens in order to resell them at a higher price. But in the end, in the conditions of the zone of risky agriculture, which includes the territory of the republic, huge areas of agricultural land turned out to be unclaimed. In the immediate vicinity of settlements on these lands, unauthorized landfills are located, which worsens their quality condition.

Another acute problem of agricultural land use is the violation of agricultural techniques for cultivating crops, which leads to low yields, reduced land fertility, deterioration of their phytosanitary condition and lack of demand among the majority of the population.

Despite the fact that regional projects have been actively developing in the republic over the past 5 years to support not only employment of the population, but also the proper use of agricultural land, there are also cases when program participants, due to the high labor costs of agricultural production in an arid climate, low profitability of the agricultural sphere, insufficient level of mechanization of production, etc., abandon their farms.

The Russian legislation does not fully reflect the content of the concept of "rational use", there are no criteria by which one can assess how rational a particular type of land use is.

The rational use of agricultural land includes an environmental component, expressed in the preservation and improvement of soil fertility and land reclamation, as well as an economic component, which consists in maintaining a high level or increasing crop yields, ensuring the growth of agricultural products. To implement environmental and economic criteria, it is necessary to develop specific legal mechanisms [12].

In order to suppress and prevent negative processes in modern agricultural land use in the Republic of Tyva, the application of liability measures to persons who commit offenses in the field of land legislation, it is necessary to improve criteria for assessing the degree of effectiveness or non-effectiveness of the use of these lands, especially in arid climates, when agricultural production is associated with climatic features of the area and strongly depends on weather conditions the conditions of a particular year. It is also necessary to improve the system of cadastral registration of existing agricultural lands and securing the

rights of new owners to them, stimulating the ordering of land ownership with all the ensuing responsibility of owners to maintain them in proper condition and use for their intended purpose.

## 4 Conclusion

The current state of agricultural land use in the Republic of Tyva requires a more extensive analysis and improvement of the effectiveness of existing legal norms. The main problem of agricultural land use is the lack of demand for land from the local population due to the complexity of agricultural production in the arid climate of the republic, non-compliance with the balance of environmental and economic criteria in agricultural land use, the absence of clear criteria for the concept of "rational land use" in legislation. Among the measures aimed at changing the situation in the field of agricultural land use, it is proposed to improve the information policy in the field of agricultural land use, the development of a monitoring system for the condition of these lands, which is especially important in an arid climate. It is necessary to review existing and develop new measures for the rational use of agricultural land, improve information policy in the field of agricultural land use, and develop a system for monitoring the condition of these lands.

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