

# On the question of the use of inter-settlement territories in the structure of urban agglomerations

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**Abstract.** The article discusses the reasons that contribute to the formation of agglomerations on the territory of the Novosibirsk region, overpopulation of urban areas that make up the agglomerations, as well as the reasons for the decrease in rural inhabited space on the territory of municipalities located within the boundaries of the regions of the region, both within the agglomeration itself and on the territory districts of the region located outside the agglomeration. The results of the influence of urban agglomerations on the state of agricultural lands located within and outside the specified agglomerations are considered. An analogy is drawn between these processes in relation to agricultural lands with lands of the named category located on the territory of the Russian Federation. A possible solution to these problems is proposed, providing for the development of conceptual approaches, including the introduction of phased structural and investment measures.

## 1 Introduction

More than 20 years have passed since the beginning of the land reform in the territory of the previously existing Soviet state, the purpose of which was development of various forms of land management, the formation of a multi-structured economy by abolishing the state monopoly on land [1].

Since formation of the Russian Federation, land reform has been gaining momentum. A number of laws were adopted that allow citizens, within the framework of various organizational and legal associations, to carry out agricultural activities, which is based on the principle of preserving the intended use of land plots [2, 3].

The security function of the state is based on the regulation of land relations within the framework of the law, and supervisory measures are also carried out to correct these legal

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relations [4]. Wherein, the current situation picture in the field of rational use of agricultural land is not in favor of the designated category of land.

Over the years, the emerging difficult socio-economic situation in the country has led to the depopulation of rural areas, the outflow of the able-bodied population to cities and over-concentration of the population in large cities and adjacent settlements [5]. This process has led to formation of urban agglomerations, concentrating the scientific, cultural potential, personnel reserve, an overabundance of the working population [6]. The reverse side of this process is, respectively, the desertification of rural areas accompanied by degradation of rural settlements and, as a consequence, their abolition. Accumulation of agricultural production near more or less "live" settlements and near urban agglomerations is accompanied by decrease in acreage and decrease in the quality of agricultural land.

The purpose of this article is to analyze modern socio-economic phenomena in inter-settlement territories using the example of the Novosibirsk region. The objectives of the study were to study the influence of urban agglomerations on the state of agricultural land and rural settlements located in the territory of the Novosibirsk agglomeration.

## **2 Materials and Methods**

The object of study is agricultural land located within the boundaries of the Toguchinsky district of the Novosibirsk region included in the Novosibirsk agglomeration. Within preparation and presentation of the study results, the data of the public cadastral map posted on the Federal Service of State Registration, Land Register and Mapping website; Earth remote sensing materials; official data published on the websites of Novosibirskstat, the Government of the Novosibirsk Region, the Ministry of Agriculture of the Novosibirsk Region; on the official website of the administration of the Toguchinsky district of the Novosibirsk region, the data obtained using the Google maps program, were used.

## **3 Results and Discussion**

The Novosibirsk Region (NSO) is no exception to the general socio-economic picture summarized in the introduction of this article in relation to the entire Russian Federation.

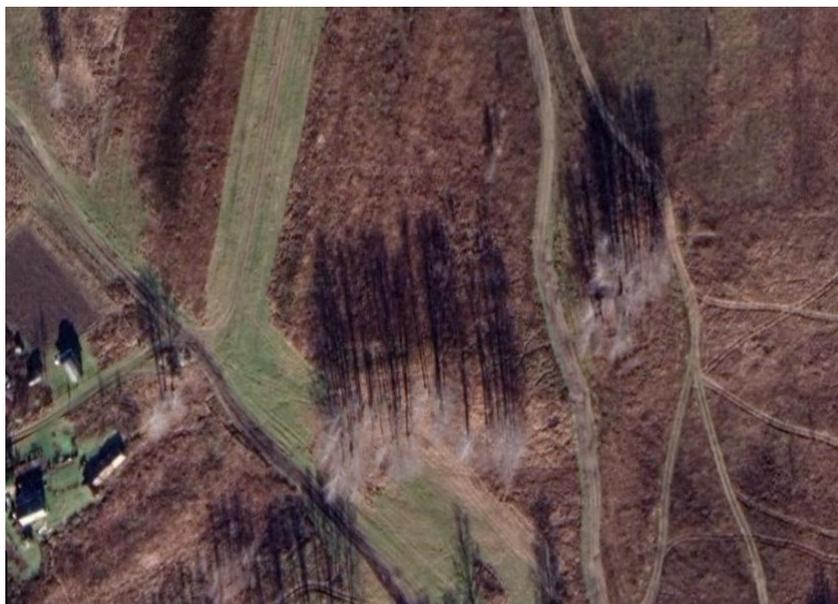
Historically, the bulk of settlements in the territory of the Novosibirsk Region arose on the place of fortifications – military fortifications erected to protect immigrants from the European part of Russia in the 17th century during the development of Siberia. The main occupations of the population were arable farming, fishing, hunting and carriage. Favorable climate, large areas with fertile lands have led to the dominance of the agricultural industry throughout all time periods of development of the territory [7]. The rapid, poorly prepared implementation of the land reform of the 90s of the last century led to an unfavorable socio-economic situation in the agriculture of the country and the Novosibirsk region in particular, caused an outflow of the able-bodied population to large regional centers and cities of the Novosibirsk region, which in turn led to decrease in agricultural activity, increase in the area of uncultivated farmland and, as a result, degradation of agricultural land.

According to a number of decrees of the President of the Russian Federation, within the framework of regional legislative initiatives in order to stabilize the situation described above, the Government of the Novosibirsk Region has developed a strategy for the socio-economic development of the Novosibirsk Region for the period up to 2030 (Strategy) [8].

The main direction of the Strategy is formation of urban agglomerations and territories of advanced socio-economic development (TASED) in NSOs. The largest urban agglomeration is Novosibirsk one, which includes 7 districts of the region, 4 cities and 1 village. The Novosibirsk agglomeration is formed on the basis of the principle of the spatial organization



chernozems, and meadow soils [14]. Specific features of natural conditions (rugged terrain, forested area) determine the rapid overgrowth of production fields and work sites with weeds and trees and shrubs in case of non-use of land for its intended purpose as a result of lack of agricultural activities [15, 16]. This process can be clearly traced on satellite images provided in the Google Maps program (Fig. 2).



**Fig. 2.** Overgrowth of fields near village Borovushka, Toguchinsky district, Novosibirsk region (images of 2021, Google maps program, scale 1: 2500).

To identify the reasons for non-use of land, an analysis of the data of the All-Russian Population Census in different years was carried out (Table 1) [17, 18].

**Table 1.** Change in population in small settlements of Toguchinsky district of Novosibirsk region.

District	Name of the settlement	2002	2007	2010	2020
Toguchinsky	Borovushka	60	43	21	N/A
	Lnikha	546	542	589	N/A

The NSO government, within the framework of a comprehensive program for the socio-economic development of the Toguchinsky district in 2011-2015 and for the period until 2025, allocated funds for improvement and development of engineering infrastructure: the construction of a water supply system and the construction of antenna-mast structures for cellular communications in Borovushka and Lnikha, renovation of the house of culture and the Lnikha library. In 2025, it is planned to perform reconstruction from the 4th to the 2nd category of the main road on the Bugotak - Lnikha - Repyevno section and to strengthen the railway tracks in order to establish protection against landslides [19]. Within the framework of the long-term target program "Development of gasification of the territory of settlements in the Novosibirsk region for 2012-2016", gasification schemes were developed for Lnikha village, Bugotak station, Bugotak village, and design estimates for gasification of Gorny settlement, Bugotak village, Bugotak station, Lnikha village in the amount of 25 million rubles. Wherein, there are no offers for investment activities in terms of revitalizing these settlements in the comprehensive program of socio-economic development of the Toguchinsky region in 2011 - 2015 and for the period until 2025 [19]. Currently, there is a

decrease in the number of students in rural schools, although Lnikha village is considered a remote village in which educational activities were previously carried out [20]. According to the electronic websites of real estate agencies, summer residents are settling in the villages of Borovushka and Lnikha, buying up village houses for recreation and summer seasonal residence [21, 22]. Therefore, the village of Borovushka practically exists as a dacha society. In the village of Lnikha, rural life is still glimmering.

Now let's refer to more general official statistics characterizing the above quantitative components in the Toguchinsky district of the Novosibirsk region. According to the information of the administration of the Toguchinsky district of the Novosibirsk region, at present, in the territory of the Toguchinsky district of the NSO, the number of settlements of the district is 107 (villages, settlements, railway sidings). By 2002, the villages of Vyemka, Kazansky, Kazarma 132 km and the village of Agafonikha were abolished [9]. At the beginning of 2017, over 1.5 thousand settlements were registered throughout the Novosibirsk region. 56 of them are registered, but do not have a population. Since the 2010 census, more than 30 settlements have disappeared from the map of the Novosibirsk region as a result of the abolition [23].

The dynamics of the population in the regions under consideration in relation to the population of the city of Novosibirsk in the period from 2002 to 2020 [24] is reflected in Table 2.

**Table 2.** Change in the population in the Toguchinsky district of the NSO, as well as in the city of Novosibirsk in the period from 2002 to 2020.

Periods	Novosibirsk	Toguchinsky district
2015	1,425,508	65,515
2015	1,621,835	55,843
2015	1,625,631	55,427

These data characterize the growth and concentration of the population in Novosibirsk, at the same time, there is a constant trend of population decline in the considered districts of the region. In general, the total number of the population in the Novosibirsk region is constantly increasing. So in 2002 the population of the NSO was 2,692,251 people, in 2007 — 2,647,195 people, in 2019 — 2,795,777 people, in 2020 — 2,798,170 people. [24]. Therefore, with a constant increase in the total population in the territory of the Novosibirsk region, there is a process of migration of the rural population to cities and regional centers. These trends indicate an outflow of labor resources and a reduction in the habitable space in the territory of the region's districts. These circumstances contribute to reduction of the cultivated areas of agricultural crops, leading to degradation of the remaining uncultivated agricultural lands. According to the results of the All-Russian Agricultural Census of 2016 for the period from 2007 to 2019, the number of sown areas of agricultural crops is steadily decreasing in the territory of the NSO [25]. However, in 2020, the quantitative indicator of sown areas slightly increased compared to the previous year [26] (Table 3).

**Table 3.** Comparative table of the number of sown areas of agricultural crops by NSO for the period from 2007 to 2020.

Sown area	2007	2010	2014	2017	2018	2019	2020
Ths ha	2,419.0	2,320.1	2,376.4	2,380.0	2,226.6	2,225.7	2,272.0

Therefore, there is a trend of constant population growth in the Novosibirsk region: its number in 2020 compared to 2007 increased by 5.4 %. Wherein, the number of agricultural crops sown in the Novosibirsk region in 2020 decreased by 6.1 % compared to 2007. This is 147 thousand hectares of uncultivated agricultural land, in respect of which the process of degradation has begun.

## 4 Conclusions

When summing up the study, we believe that it is possible to draw the following conclusions.

Formation of the Novosibirsk agglomeration in the territory of the Novosibirsk region is due to the created socio-economic situation, which entailed the migration of the rural population to regional centers and cities located near the city of Novosibirsk, which are most susceptible to its influence. These circumstances contribute to the process of overpopulation of these cities located in the territory of the Novosibirsk agglomeration and, in turn, to decrease in the rural inhabited space in the territory of municipalities located within the boundaries of the region's districts within the Novosibirsk agglomeration itself. Along with these processes, there is a decrease in the number of sown areas of agricultural crops on agricultural lands located in the territory of the Novosibirsk agglomeration, as well as in the territory of the entire Novosibirsk region. These circumstances contribute to the degradation of uncultivated agricultural land. It shall be noted that the described processes and the obtained study results do not differ from the general picture emerging in relation to agricultural land located throughout the territory of the Russian Federation.

Elimination of these negative processes accompanying the creation of agglomerations, in our opinion, is possible when developing a conceptual direction within the framework of a state scientifically grounded food security program, for example, "Agrarian Russia", the purpose of which could be phased structural and investment measures aimed at development of domestic agricultural production, restoration of suburban farmland and consolidation of the population in the inhabited territories. Any form of economic activity is acceptable here — from agricultural holdings and farms, up to individual private farmsteads with elements of agritourism. Wherein, reducing the consequences of sanctions pressure at the international level and eliminating trade barriers will increase the export of agricultural products abroad, which will also serve as a powerful incentive for development of this industry.

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