Analysis of Complex Cadastral Works to Fill a Large Spatial Database

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Abstract: The accuracy and completeness of cadastral data are key factors for the protection of property rights to real estate and land, as well as for the implementation of state land policy and regulation of land markets. Deficiencies in the cadastral data of the Unified State Register of Real Estate can lead to conflicts between real estate owners, unjustified allocation of land resources, spending time and money on conflict resolution and error correction, making the right operational management decisions. The article shows the analysis of complex cadastral works on the example of the Republic of Sakha (Yakutia), as a result of which a large database of spatial data is being filled on the digital platform of Rosreestr.

1 INTRODUCTION

Rational use of land resources and their protection is possible in the presence of complete, correct and reliable information about real estate objects contained in the Unified State Register of Real Estate. Due to the imperfection of land legislation and its regular changes, countless errors, disputes, shortcomings have appeared regarding the location of the boundaries of land plots, which form shortcomings in land use, violate the rights of third parties and negatively affect the development of land relations and territories in general. There are many land plots that do not have exact boundaries, there is no tying up of buildings and structures to land plots. One of the ways to solve such problems is to carry out complex cadastral works, the global goal of which is that the entire land of Russia should be taken into account and described within one large spatial database on the digital platform of Rosreestr – the Unified State Register of Real Estate (EGRN). This is necessary for the quality management and disposal of real estate objects and to increase the flow of funds to the budget from tax collection, as well as to protect the rights and interests of the rightholders of real estate objects.

The accuracy and completeness of cadastral data are key factors for the protection of property rights to real estate and land, as well as for the implementation of state land policy and regulation of land markets. Deficiencies in cadastral data can lead to conflicts between real estate owners, unjustified allocation of land resources, and spending time and money on conflict resolution and error correction, making the right operational management decisions.

Thus, the organization of complex cadastral works is of paramount importance today, since it is associated with the need to process geospatial information, analyze it and promptly update it. Such works are an important element of effective management of territories and real estate objects, therefore, they act as a tool for organizing urban planning processes, territorial planning and implementation of the fiscal policy of the state, protection of the rights of owners of real estate objects (Egorova, Zarubin, Larina, 2023).

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2 RESEARCH METHODOLOGY

The purpose of the work is to determine the method of filling the Unified State Register of Real Estate with information about real estate objects, including land plots. To achieve the goal, the following tasks are defined:

1) identify the main problems of filling the real estate cadastre, including land plots;

assess the impact of problems on rightholders and land users;

2) develop proposals for solving problems.

The scientific novelty of the study consists in analyzing a new land management event – complex cadastral works on the example of the Republic of Sakha (Yakutia).

The research is of a scientific and applied nature, conducted in the office conditions on the basis of the Department of Land Management and Landscape Architecture of the Faculty of Forestry and Land Management of the Arctic SATU. The work uses normative legal acts of the Russian Federation and the Republic of Sakha (Yakutia), materials of the Rosreestr, Ministry of Property of the Republic, SUE Republican Center for Technical Management and Technical Inventory, special literature and others. The study used methods of economic and statistical analysis, analysis of economic information, generalization, description, comparative analysis.

3 STUDY RESULTS

Complex cadastral works (CCW) are cadastral works that are performed simultaneously in respect of all located on the territory of one cadastral block or territories of several adjacent cadastral blocks: 1) land plots registered in the EGRN; 2) land plots, the formation of which is provided for by approved land surveying projects; 3) buildings, structures (with the exception of linear objects), as well as objects of unfinished construction registered in the EGRN.

As a result of the implementation of the CCW: 1) the location of the boundaries of land plots is clarified; 2) the location of buildings, structures, objects of unfinished construction is established or clarified on land plots; 3) the formation of land plots on which buildings are located, including apartment buildings, structures, with the exception of structures that are linear objects is ensured; 4) the formation of public land plots occupied by squares, streets, driveways, embankments, public gardens, boulevards, water bodies, beaches and other objects is ensured; 5) correction of registry errors in the EGRN information on the location of the boundaries of land plots and contours of buildings, structures, objects of unfinished construction is provided.

Repeated execution of complex cadastral works on the territory of the same cadastral block is not allowed. The indicator (measure) of effectiveness is the number of real estate objects on the territory of cadastral blocks, in respect of which complex cadastral works have been carried out.

Complex cadastral works are carried out at the expense of the federal and republican budgets, as well as local budget funds to establish the boundaries of land plots, capital construction projects in a certain cadastral block (Federal'nyj zakon «O kadastrovoj deyatel'nosti» ot 24.07.2007 № 221-FZ).

On the territory of the Republic of Sakha (Yakutia), complex cadastral works specifying the location of real estate objects have been carried out since 2018 as part of the implementation the Strategy of Socio-Economic Development of the RS (Ya) until 2032, approved by the Head of Yakutia in December 2018.

In 2023, complex cadastral works are carried out on the territory of the city district "city of Yakutsk", Gorny, Ust-Aldansky, Mirny, Lensky and Vilyuysky districts (Kompleksnye kadastrovye raboty provodyatsya v respublike. Oficial'nyj informacionnyj portal Respubliki Saha (YAkutiya)).

For the period 2018-2021, complex cadastral works were carried out on the territory of 6 municipal districts and the city of Yakutsk with respect to 16,889 real estate objects, including 9,614 land plots and 7,275 capital construction objects (Fig.1).

In 2022, complex cadastral works were carried out on the territory of 11 municipalities of the Republic of Sakha (Yakutia). The work was carried out in 138 cadastral blocks, on the territory of which 59,830 real estate objects were registered in the Unified State Register, of which 23,885 objects have borders, 35,945 objects do not have borders (Tables 1 and 2).

As a result of the work performed, information was entered into the state cadastre of real estate for 47 cadastral blocks out of 138 quarters. The total percentage of work performed was 34.06% (Table 2).

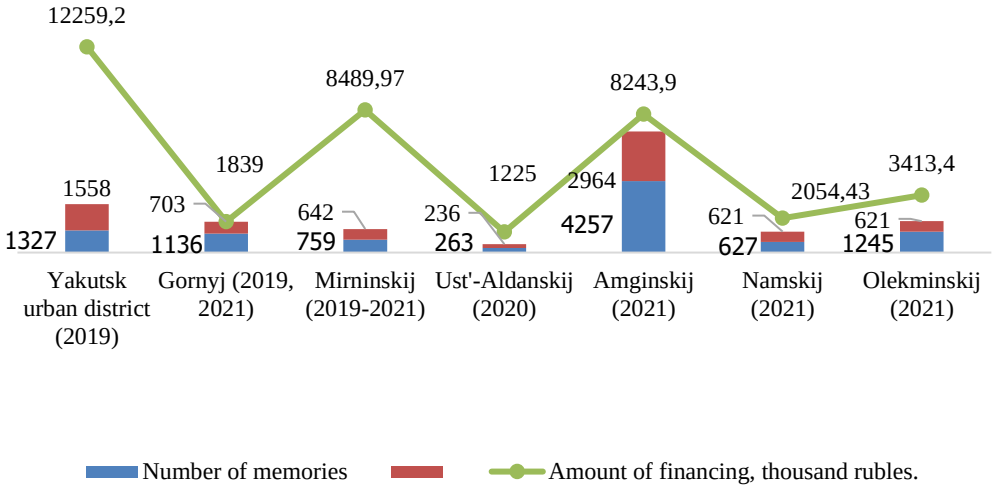

Figure 1: Complex cadastral works in the Republic of Sakha (Yakutia) for the period 2018-2021.

Table 1: The quantitative composition of real estate objects for complex cadastral works.

No.	Name of the district/ city district	Number of real estate objects, units.		
		With borders	Without borders	Total
1	Amginsky	2030	2691	4721
2	Gorny	2190	1430	3620
3	Kobyaysky	142	563	705
4	Lensky	187	718	905
5	Namsky	10024	10343	20367
6	Neryungrinsky	2699	2353	5052
7	Olekminsky	182	1095	1277
8	Suntarsky	262	3606	3868
9	Ust-Aldansky	2804	7804	10647
10	Churapchinsky	2963	4688	7651
11	The city of Yakutsk	402	615	1017
	Total	23 885	35 945	59 830

Table 2: Result of complex cadastral works in 2022.

No.	Name of the municipal district/city district	Number of cadastral blocks, units.	Entered into the EGRN, units.	Percentage of execution, %
1	Amginsky Ulus MD	11	4	36.36
2	Gorny Ulus MD	8	2	25.00
3	Kobyaysky Ulus (district) MD	4	2	50.00
4	Lensky district municipality	10	4	40.00
5	Namsky Ulus municipality	24	7	29.17
6	Neryungrinsky district municipality	26	16	61.54
7	Olekminsky district MD	5	2	40.00
8	Suntarsky Ulus MD	10	1	10.00

9	Ust-Aldansky Ulus (district) MD	22	6	27.27
10	Churapchinsky Ulus MD	12	2	16.67
11	City of Yakutsk city district	6	1	16.67
	Total	138	47	34.06

In the process of carrying out complex cadastral works, aerial photography works were carried out using complexes created on the basis of an unmanned aircraft (UAV) for the purpose of surveying the territories of the CCW (Fig.2). In all localities where the work was carried out, the Unified State Register of Real Estate contains information about land plots and structures (linear objects) that are absent on the ground (Fig.3).

Figure 2: Aerial photography.

Figure 3: The object of the study.

With the help of complex cadastral works, registry errors made by cadastral engineers are corrected. So Figure 4 shows the overlay of layers: orthophoto + electronic map + information from the cadastral plan of the territory. It shows that the borders have actually changed, do not coincide with the information of the EGRN, it is necessary to carry out work to correct the registry error. Figure 5 shows a general view of the displacement by 22 m.

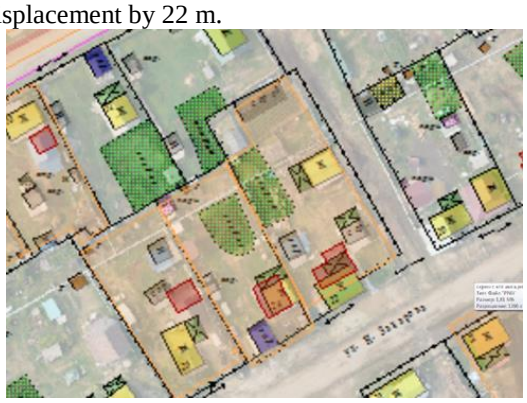

Figure 4: A general view of the overlay of layers on the study area.

Figure 5: A general view of the displacement of the boundaries of land plots.

The results of the complex work are the clarification and correction of the boundaries of land plots in the Unified State Register of Real Estate; the formation of public territories; the identification of unauthorized objects (further work within the framework of municipal land control); the increase in the rightholders of real estate objects; the growth of the tax base; the identification of land plots suitable for involvement in economic turnover; savings of

individuals to develop a boundary plan (Gavrilova, Maslova, 2021).

4 RESULT DISCUSSION

The main problems can be identified:

1. Low efficiency of cadastral engineers. Often, employees of cadastral authorities do not have sufficient knowledge and experience, which leads to errors in work and incorrect filling of cadastral documents.

2. Insufficiently developed infrastructure of cadastral activity. Cadastral authorities do not always have the necessary technical and organizational resources to carry out survey work and document processing (Makarov, ZHukova, 2021).

3. Insufficient attention to quality control of cadastral works. It is necessary to introduce mechanisms for monitoring the quality and timing of work.

4. Problems of synchronization of cadastral data with other state registers, for example, the real estate register or the register of land rights, registers of state or municipal authorities (Zagorodnov, Titov, 2020).

5. Low awareness of citizens about the procedures for registration of rights to real estate and land and the need to participate in these procedures.

6. Lack of incentives for owners of real estate and land to actively participate in the filling of the cadastre.

7. Problems associated with taking into account new types of real estate objects, such as engineering infrastructure and energy facilities, in connection with the development of modern technologies (Semenova, 2022).

8. Insufficient attention to accounting and protection of natural resources when filling the cadastre (Fedorova, Krylov, 2020).

9. Problems related to updating cadastral data.

To improve the content of the cadastre and reduce possible problems for rightholders and land users, it is proposed to:

1. Create a unified spatial data system. This will allow verifying the information of the Unified State Register of Legal Entities and other registries, minimizing the number of errors, reducing the time of accounting and registration, and clarifying information about the rightholders of real estate objects.

2. Carry out more frequent updating of the cadastre and strengthen control over the accuracy of the information contained in it. To do this, new technologies can be used, such as remote sensing and geoinformation systems, which will help to establish the boundaries of land plots with greater accuracy.

3. Improve cooperation between the various state bodies that are engaged in maintaining the cadastre, and establish a more effective information exchange system. This will help to reduce the number of errors and improve the accuracy of data in the cadastre.

4. Make the cadastre more accessible to ordinary citizens so that they can receive information about their land plots and participate in the process of filling the cadastre. For example, you can create an interactive cadastre map that can be used to view information about land plots and send requests for data changes.

5. It is necessary to carry out more extensive information work among rightholders and land users so that they can be aware of all changes and innovations in the cadastre and can seek help in a timely manner if any problems arise.

5 CONCLUSION

Complex cadastral works are carried out simultaneously with respect to all real estate objects located on the territory of the cadastral block. With their help, registry errors are eliminated, new information about new land plots is entered, the location of the contours of objects is determined, which makes it possible to tie-up buildings and structures to land plots. Thus, the basic principle of the land legislation of the "common destiny", established by Article 1 of the Land Code of the Russian Federation, is observed (Murav'eva, 2022), the Unified State Register of Real Estate is provided with reliable cadastral information (Romanova, 2020) in digital format, the quality of life improves, which is one of the important indicators of the level of development of society (Barlybaev, Ishnazarova, Sitnova, 2021).

In general, when carrying out complex cadastral works, all land plots and real estate objects will be taken into account and described within one digital platform – the Unified State Register of Real Estate, which will affect the quality management and disposal of real estate objects and, as a result, an increase in the flow of funds to the appropriate budget level from the use of real estate objects, including land plots, as well as the protection of the rights and interests of rightholders.

Carrying out complex cadastral works for citizens will turn into solid advantages:

firstly, the surveying of a citizen's land plot will be carried out at the expense of state funds and local budget funds - you will not have to pay for surveying;

secondly, surveying, as a rule, will be carried out jointly with neighboring sites, which further prevents disputes over borders with neighbors;

thirdly, it will not be necessary to apply to the regional Department of Rosreestr with an application for entering the boundaries of the land plot into the Unified State Register of Real Estate.

The practical significance of the work lies in the fact that it can be used as an information source and a methodological guide for a wide range of people whose activities are related to the research topic.

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