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INTEGRATED LAND MANAGEMENT IN DEVELOPMENT OF GAS SUPPLY SYSTEM OF RURAL TERRITORIES

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Abstract

This article proposes a substantiation of the author's approach to establishing the content, sequence and features of integrated land management in the development of a gas supply system for rural areas. To achieve this goal, the authors investigate the following issues. The first is determining the content of territorial land management in the gasification of rural administrative formations, substantiating the methodological sequence for solving the design problem of integrated land management. The second is determining the features of integrated land management in the development of gas supply to rural municipal areas. Methodically, the design land management problem is solved in the following sequence. This is making a decision on the redistribution of land, establishing the parameters and value of the allotted property, establishing compensation for the occupation of land, determining the conditions for restoring the disturbed surface of the territory, establishing payments for land property. The peculiarities of land management here are: participation in the process of land property of various functional purposes, priority of social goals, comprehensive solution of land management tasks for the entire district, taking into account the existing infrastructure, targeted financing of design and construction work. The implementation of the author's proposals is aimed at creating favorable organizational and territorial conditions for the development of gas supply to rural areas, improving the living conditions of the local population, increasing the investment attractiveness of municipalities, optimizing the system of use and redistribution of land and property complexes in rural areas.

Keywords: Land management, rural areas, social infrastructure

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1. Introduction

In Russian conditions, the problem of reliable heat supply to the territories has always been and continues to be urgent. This problem is especially urgent for rural administrative units, where there are no significant thermal energy production capacities, there are no large energy producers of their own. Usually producers are located in large cities, and municipal enterprises are characterized by low capacity and low level of development. Here, the choice of alternative sources of heat supply for housing and production is limited, and a low level of financial capabilities of heat consumers is noted. Local heat consumers are located at a great distance from large heat production centers. The industry is characterized by low investment attractiveness of energy development, as well as high costs for the construction and operation of energy infrastructure.

Most of the Russian territory is in unfavorable, harsh climatic conditions with long winters and a large number of cold days per year (Kokorin, 2018). This circumstance determines the importance of reliable energy supply to rural administrative regions. This problem is acute in all Ural regions, including the Perm Territory, located in the Western Urals. In many villages and hamlets of the Kama region, residential buildings are still heated with wood and coal. New residential buildings are usually heated in combination - electricity, coal (firewood); electricity, gas; gas, coal (firewood). Among all energy carriers in Russian conditions, the cheapest is natural gas, the possibilities of practical application of which are quite wide for both economic and industrial purposes (Pavlikhina, 2020). Therefore, the significant interest of the scientific community in the issues of solving the problems of gasification of remote territories and gas supply of settlements in rural administrative regions is understandable. This process requires sound land management support.

2. Problem Statement

The solution of these problems should be facilitated by the system of land management and organizational and territorial design. With its help the land use of real estate in the oil and gas complex is formed, timely and reasonable changes are made to the existing land and property complexes. The territory of lands of various functional purposes is arranged, land and other real estate are redistributed, conditions and the procedure for the use of land and property complexes, issues of economic and social development of rural municipalities are being addressed.

The current state of land management and land management design is unsatisfactory (Komov, 2019). There are many problems in this area, and these problems should be solved at the state level with the help of various systemic measures of an administrative, political, economic, organizational, managerial, legal, and technical nature. This requires a new land policy in the country (Khlystun, 2020). The biggest problem of organizational and territorial practice can be considered the lack of institutions that implement this practice and the destruction of production to solve design land management tasks and implement project proposals directly on the ground. Many design tasks today are not solved at all, and those that still exist are solved in a simplified form, which does not contribute to rational land tenure, the formation and development of land and property relations.

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3. Research Questions

In particular, the practice of land management support for the formation of land property of the gas complex, gas supply networks requires significant adjustment. The nature of land management in this case will be cross-sectoral and territorial, since land management actions will affect the interests of subjects of different spheres of economic activity and land of various administrative entities. Such tasks should be solved in a comprehensive manner on the basis of a comprehensive account of the conditions of the land management area and the consequences of the redistribution of land and property complexes. The methodological sequence of solving the organizational and territorial problems of the development of the system of supplying gas to rural areas in modern conditions requires a separate study.

In this article, the authors explore in detail the questions:

1. Clarification of the content of the design task of territorial land management in the gasification of rural administrative units.
2. Substantiation of the methodological sequence of organizational and territorial measures in the development of gas supply to rural areas.
3. Determination of the features of integrated land management in ensuring gasification of rural municipalities, taking into account the cumulative effectiveness of territorial land management measures in the development of gas infrastructure in rural areas.

4. Purpose of the Study

The purpose of the presented work is to substantiate the author's approach to establishing the content, sequence and features of integrated land management in the development of a gas supply system for rural areas.

5. Research Methods

The substantiation of the author's proposals on land management support for the development of the property complex of the gas industry determines the need to apply various methods of scientific research.

The analysis of the basic conditions of the study and the established practice of the formation of land use of the gas infrastructure was carried out using statistical and analytical methods. The substantiation of the indicators of the design task of territorial land management was carried out using the computational and constructive method. Establishing the content and features of integrated land management in the development of a gas supply system for rural administrative formations required the use of a monographic method of scientific research.

6. Findings

The content of territorial land management during the gasification of rural administrative formations should be traditional and based on current land cadastral data (Bryzhko & Bryzhko, 2020). The design activities should be based on the provisions of the forecast scenario for the development of the

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land and property complex of the gas supply industry in a rural area. On the basis of pre-design, forecast provisions, specific organizational and territorial documents are developed - projects for inter-sectoral redistribution of land property and the formation of land use for oil and gas facilities. At the end of the land management process, it is required to substantiate working land management measures for the restoration of land property damaged as a result of the construction of networks and gas supply facilities. At the same time, in the centre of the land management system there should be a project for the organization of the territory, through the practical implementation of which the land property of the gas supply industry is formed (The predicted values of the development of the gas supply system can be taken from the plans or programs for the development of the industry, and the technical conditions for land restoration can be included in the project as one of its sections). In this case, the content of organizational and territorial decisions is reduced to the implementation of the following land management actions: the formation (or development) of land property of the gas supply system. It is carried out by providing land to gas supply enterprises with the simultaneous withdrawal of these plots from former users. Usually, former users of real estate are engaged in various economic activities not related to gas supply. Therefore, land management here is cross-sectoral in nature.

The methodological sequence of organizational and territorial measures in the development of gas supply to rural areas has its own specifics. We will consider the features of land management in ensuring gasification of rural municipalities in terms of the basic stages of the content of the design land management task.

The first stage is making a decision on the forthcoming redistribution of land property for the development of gas supply in the rural administrative-territorial unit and a comprehensive substantiation of the design solution.

Since the land is already in economic activity (or in reserve lands), a procedure for its redistribution is required in the interests of industry (oil and gas complex).

In contrast to the formation of a separate real estate object in the oil and gas complex, where, after securing funding, the site is immediately selected and options for land allocation are considered (Volkov, 2015). When solving these issues for the rural municipality as a whole, it is necessary to first assess the already achieved level of gasification in the area, the capacity of gas supply networks, the possibility of increasing the number of social consumers. This includes the remoteness of municipal gas supply facilities and similar facilities in adjacent territories, data on the technological difficulties of construction, the real need of the district for gasification in the absence of alternative sources of heat and energy supply. Options should be worked out that would make the construction of oil and gas facilities cheaper for society by forming new facilities within the boundaries of existing infrastructure networks, lengthening gas supply networks for associated gasification of the territory, maximizing the use of the capacities of functioning facilities and gas supply networks in the municipal territory and adjacent territories. It should be noted that there is a close connection between the development of infrastructure and market mechanisms in the agrarian sphere (Stukach, 2020).

The illustration of the author's proposals in the article is made by the example of land management gas supply to rural settlements of the Elovsky district of the Perm region. This municipality is a typical area of the southwestern territories of the region. More than two-thirds of the district's territory is

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occupied by agricultural land, which determines the agricultural specialization of the municipality. The population of the district lives in villages and villages requiring systemic improvement, including the provision of natural gas for heating residential premises and utility structures (official website of the Elovsky municipal district).

On the lands of the municipality, there is a main pipeline from the Bolshaya Usa gas distribution station to the administrative center of the district - the village of Elovo. Taking into account the route of this infrastructural object, the directions of the prospective gasification of the administrative-territorial rural formation are determined.

Now its 8975 people live in the district. The majority of the population lives in villages and villages located in the northern part of the region (these are the territories adjacent to the Kama River). The local population is about 84% of all residents of the municipality[1]. The main administrative and social facilities are located here. Therefore, it is these settlements that should be primarily provided with natural gas. In addition to other circumstances, the development of gas supply to the rural area in this direction is economically feasible, since it allows the use of existing gas infrastructure facilities (the main gas pipeline to the village of Elovo).

It is necessary to design two additional lines from the existing gas pipeline: to the west Baranovka-Kalinovka-Shuldikha-Dubrovo, to the east Faor-Kresty-Plishkari. To save the land allotted, the first and second gas pipelines should be laid within the boundaries of the highway allotment to the villages of Dubrovo and Plishkari.

The second stage is the establishment of the parameters of the formed land use of infrastructure facilities, the determination of the area and value of the redistributed land property. Here it is important to minimize the area of redistributed land, for which it is proposed to provide for an underground location of the gas supply networks under construction and the alignment of gas pipelines with existing road facilities. The routes of the new gas pipelines are being designed parallel to the Tchaikovsky-Kukushtan highway with a length of the first - 24.1 km, the second - 4.9 km. The pipe diameters of local gas pipelines are usually no more than 124 mm. The width of the land allotment strip during the construction of the gas supply facility is no more than 20 m for forestland and 28 m for agricultural land.

For the period of construction of the first line (Dubrovo), 54.79 hectares are withdrawn, including 29.66 hectares of arable land, 0.59 hectares of hayfields, 2.48 hectares of pastures, 22.06 hectares of other land. For the construction of the second line (Plishkari) 13.3 hectares of land are allotted, of which 11.11 hectares are arable land, 0.99 hectares are pastures, 1.2 hectares are other land. It is not planned to provide land plots for gas supply networks for unlimited use in order to save land resources. The value of the redistributed lands is: for the first line from 20 to 54 bonitet points, for the second line from 20 to 48 bonitet points. Taking into account the need of local social communities for the planned gasification, it is proposed to conduct the main construction on municipal lands in order to reduce the cost of construction and reduce damage due to the occupation of private lands.

The third stage is the establishment of the amount of compensation for the redistribution of land property. A feature of the land management support of the land redistribution process in our case is the determination of the amount of compensation only for individuals and legal entities. Compensation for municipalities will not be determined, since gas supply networks play the role of social facilities, the

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construction of which will improve the living conditions of people. Here it is possible and necessary to do with a simple agreement on the conditions for restoring the rights of municipalities to land violated during the construction of gas pipelines.

According to modern rules, damage should be compensated in connection with the alienation of real estate, crops, unpaid investments, lost income as a result of the placement of a linear facility on the land of the owners (Decree of the Government of the Russian Federation No.262, 2003). In our case, during the construction of the first line (Dubrovo), these are Perm Vegetables LLC and Agrofirma Leader LLC; during the construction of the second line (Plishkari) - this is Naturprodukt LLC. There is no real estate along the construction route. Sowings of potatoes and wheat are alienated at a cost: the first line - 448 thousand rubles, the second line - 78 thousand rubles. This damage can be compensated for by the timing of the start of construction (start construction after harvest). Plots with unpaid capital investments and work in progress by the projected land redistribution are not affected. Losses of income of agricultural enterprises in connection with short-term (up to 3 years) occupation of land property are the first line of the gas pipeline - 576 thousand roubles, the second line - 213 thousand roubles.

The sectoral damage to the agrarian economy associated with the redistribution of productive land in our case is not compensated, since after the completion of construction and restoration of the disturbed soil cover, land and property complexes will continue to be in agricultural circulation.

The fourth stage is the determination of technical conditions for the removal and use of the surface layer of the soil, restoration of the disturbed surface of the land and property complex. In order to prevent the loss of the fertile part of the land during the construction process, the soil should be removed and further used to restore the damaged surface of the areas where gas supply lines are being built along the entire length of the facilities (Resolution of the Government of the Russian Federation No. 800, 2019). With an average thickness of the fertile soil layer of 0.45 m on the construction site, the volumes of soil removed are for the first gas supply line - 276 142 m^3, for the second gas supply line - 67032 m^3. In our case, in order to rationalize the construction technology and reduce costs, it is advisable to do without piling up the removed soil layer in dumps (for long-term storage), and to lay the fertile layer immediately after the construction of underground gas pipelines in its original place. This will allow one, after the completion of construction and installation work, to immediately restore the damaged surface on the territory and return the land property to its owners.

The fifth stage is the establishment of the amount of land payments for the temporary use of land property for the period of construction of linear facilities.

On average, for the Elovsky municipality, the cadastral value of land used for agricultural production is 11440 roubles per hectare (Resolution of the Government of the Perm Region No. 792-p, 2012). On the basis of this indicator, the land tax is calculated and paid by the owners of land property. For plots under the first gas supply line (Dubrovo), the amount of land tax is 1,880 roubles, and for plots under the second line (Plishkari) 456 roubles. Since the land property remains with its owners, during the entire construction, the latter will have to pay land payments to the local budget. For the period of construction of linear infrastructure facilities, the gas supplying organization will be obliged to pay rent to the owners of land property under a lease agreement. The amount of the rent will not be less than the amount of the land tax; otherwise the rent will not be beneficial to the land owners. In our case, the rent

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will exceed the size of the land tax because, in contrast to the tax payment of 0.3% of the cadastral value of land, a tax rate of 1.5% of the cadastral value of the property will be set for rent in accordance with the law (Tax Code of the Russian Federation). The rent for the land property under the first gas pipeline under construction will be 9402 roubles, under the second - 2282 roubles. Reducing the construction time is beneficial for the gas supply industry enterprises, as it will reduce their expenses for rent payments for the use of other people's land and property complexes. It should be noted that these payments are among the economic instruments for regulating land use (Rogatnev & Yusova, 2019). For the subsequent maintenance of gas supply lines, it is advisable to establish a free easement on the property, to which it will be necessary to provide access to repair and service gas services.

Thus, the specificity of land management in our case manifests itself at all stages of solving the project problem and concerns making a decision on the redistribution of land property, establishing the location, quantitative and qualitative characteristics of the redistributed land property. This includes determining the amount of compensation for the shortfall in income by owners from land use, determining the conditions for the removal and use of the soil layer during construction and installation work, the establishment of land payments for the use of property complexes.

High-quality land management support for the development of a gas supply system for rural areas in the Urals pursues an important social goal - improving the lives of people living in agricultural areas. It is therefore important here to correctly assess all the consequences of engineering construction by analogy with the assessment of the consequences of the development of the road infrastructure of the village (Bryzhko & Bryzhko, 2019). It is important that the effect of the development of infrastructure exceeds the possible negative consequences of construction and, ultimately, work to improve the integrated living conditions of villages and villages (Ogarkov & Ogarkov, 2019). The latter creates the necessary prerequisites for the positive dynamics of the development of agricultural production (Semin, 2020).

In our case, given the location of gasified settlements along a large reservoir, it is possible to develop in the Elovsky district the sphere of providing services for organizing fishing, water sports, recreation, and tourism. This, according to research, can increase the liquidity of property complexes and increase real estate prices by an average of 43% (Czyzewski et al., 2017). In addition, such actions will have a beneficial effect on ensuring diversified employment of rural workers (Shumakova & Kosenchuk, 2019). Through territorial land management, it is possible to exercise government influence on market mechanisms and operations with land and property complexes (Evans, 1999).

The features of integrated land management in the gasification of rural municipal areas can be considered the following:

1. Complex land management affects property complexes of various functional purposes and permitted use. Here agricultural land, forest areas, plots within the boundaries of villages and villages are allocated. A large number of gas supply facilities under construction located throughout the municipal territory requires taking into account all the consequences of real estate redistribution.

2. The priority of the social, rather than the sectoral nature of the substantiation and effectiveness of territorial land management. The interests of local residents are put at the forefront and all organizational and territorial actions ensure the improvement of people's living conditions.

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3. Comprehensive solution of organizational and territorial issues aimed at eliminating all the problems of gasification of the municipal territory (which requires the solution of several design tasks for the redistribution of land property).

4. Accounting for existing on the territory of the municipality (and in adjacent territories) and already operated gas supply lines and gas infrastructure facilities. If necessary, planning of their reconstruction, capacity increase, repair.

5. The need for targeted financing of a complex of design and survey, construction, installation and restoration work.

For the development of a land management system for gasification of rural municipalities, the authors consider it expedient to introduce into practice a model of integrated territorial land management (Volkov, 2019).

In the process of integrated land management in our case, the following solutions were proposed:

- to ensure the possibility of constructing gas pipelines to all large settlements of the rural administrative entity;
- in order to reduce the cost of construction, it is planned to lay underground linear objects along the branches of highways;
- design and survey work should be carried out along all lines at the same time;
- damage caused by temporary redistribution of land property is compensated only to organizations in the agricultural sector; municipalities are not reimbursed for damage, since construction is carried out in the interests of the local community;
- the removed layer of soil immediately after laying the gas pipelines returns to its original place to reduce damage to property owners and damage to the existing organization of the territory;
- during construction, it is envisaged to collect land payments in the form of rent, and after the gas supply lines are put into operation, a free servitude is provided for servicing engineering facilities, repairing them, and carrying out service technological work.

The implementation of these proposals makes it possible to reduce the costs of developing the gas supply system of the rural municipality, to provide gas to all large settlements of the district. It will also allow one to improve the state of the social sphere of the municipality, to optimize the forthcoming redistribution of land property, to ensure the safety of the most valuable land and property complexes, to reduce the time required to restore land productivity, to minimize the consequences. disturbed agricultural production.

7. Conclusion

In modern conditions, the practice of land management support for the development of gas supply to rural areas needs to be improved.

The content of integrated land management is reduced to the formation or development of the land and property complex of the gas supply industry, which is carried out by providing land to gas supply organizations with the simultaneous withdrawal of these plots from former users.

The methodological sequence of solving the design problem of land management in this case is as follows: making a decision on the redistribution of land property for the development of gas supply in the

rural municipality, establishing the parameters and value of the redistributed property. This sequence concerns establishing the amount of compensation for the redistribution of land property, determining the conditions for removing and using soil, restoring the disturbed surface of the territory, establishing the amount of land payments for real estate.

The peculiarities of integrated land management in the gasification of rural areas include: coverage of land management of land property of various functional purposes, priority of social justification and effectiveness of territorial land management. They also involve comprehensive solution of organizational and territorial issues in the interests of gasification of the municipality, accounting of existing facilities and gas supply lines and their capacity, the need for targeted financing of the entire range of design and construction works.

As a result, favourable organizational and territorial conditions will be created for the development of gas supply to rural areas, the living conditions of people will be improved, the investment attractiveness of municipalities will be increased, the system of use and redistribution of land and property complexes in the rural area will be optimized.

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