Ecologization of water-land property matters on the territory of the Tom lower course

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Abstract. In the present paper the water-land property complex is considered as a strategic resource of the city development. The formulated question is expounded through the example of water-land property complex usage on the territory of the Tom lower course for land-use planning and developing the systems of water recourses management and land tenure. Consequences of liquid radioactive waste (LRW) landfilling are investigated in terms of arable farming. Also, forming a water budget of the soils spread on the area of the Tomsk underground water supply cone of depression and its role in the development of agricultural industry are studied. The main aspect of the analysis is the incorporation of social, economic, and ecological requirements for the system of life-supporting branches of municipal economy and social services. As far as the system of land tax payments plays an important role in land property complex management, the common issues and tendencies are specified in the paper. These problems are concerned with the inadequate incorporation of an ecological constituent in the methods of cadastral valuation of lands, as well as the situation of the narrow area of its results usage in the Russian Federation. Natural factors (hydrological, territorial, geological (geomorphologic) territory conditions) are combined by the authors into a special group. These factors should be reflected in the results of cadastral valuation. Also, in order to protect the interests of water consumers, it is offered to establish the Water Consumers Association based on the international experience of such countries as Spain and Uzbekistan.

1. Introduction

In the middle of the current decade the transition toward a market economy has completed in Russia. The transition of the Russian economy from an export raw type to an innovative social-oriented type of development is connected with the formation of a new mechanism for social development based on the balanced social equity and national competitiveness. This approach requires implementing the complex of interrelated transformations.

The changes in the approach to regional planning (formation of the integrated system of strategic and operative planning at all levels) belong also to the above-mentioned type of transformations.

Priority guidelines of strategic policy are as follows: development of life-supporting branches of municipal economy and social services; development of land and property markets, involving simplification of land rehabilitation procedures; formation of the institute of mass real property valuation and further administration of real property full-value taxation.

Implementation of priority guidelines in municipal structures is influenced not only by the presence of raw and financial resources, but also by the level of land resources reactivation and their infrastructure supportability. Therefore, one of the main aims of land policy in the city is formulated as an efficient land and property use, which is able to provide a breakthrough in solving social and economic problems of the city.

2. Research object

It is possible to consider the stated issue through the example of the urbanized water-collecting area of the Tom lower course consisting of Tomsk, Seversk, Tomsk and Shegarsky regions lands.

Development of the analyzed urbanized territory depends, primarily, on the quality of land resources and anthropogenic activities operating upon it.

A distinguished feature of the considered urbanized territory is its location. The territory is situated in the South-East part of the West Siberian artesian basin, where all aquifer systems are in the condition of intensive water exchange, and they contain infiltration waters having a similar hydrogeochemical profile [1, 2]. Only in the northern part of an interstream area the waters of chalk and Paleozoic deposits are identified in the zone of delayed water exchange. 45 settlements are situated on the territory of the Ob-Tom interstream area: 38 settlements come under 6 administrative country districts of Tomsk region, 5 of them form a part of Shegarsky region and 1 is a part of Kozhevnikovsky region. Besides, Nizhniy Sklad settlement goes for Tomsk city boundary, administratively. The considered territory develops intensively. All the main processes of human life activities are concentrated there as well as the objects of land and property complex with various functions, which need to be in the ecological balance with nature in order to increase the life quality of population.

Engineering systems of water resources utilization and military-industrial complexes are operated jointly on this territory (Figure 1).

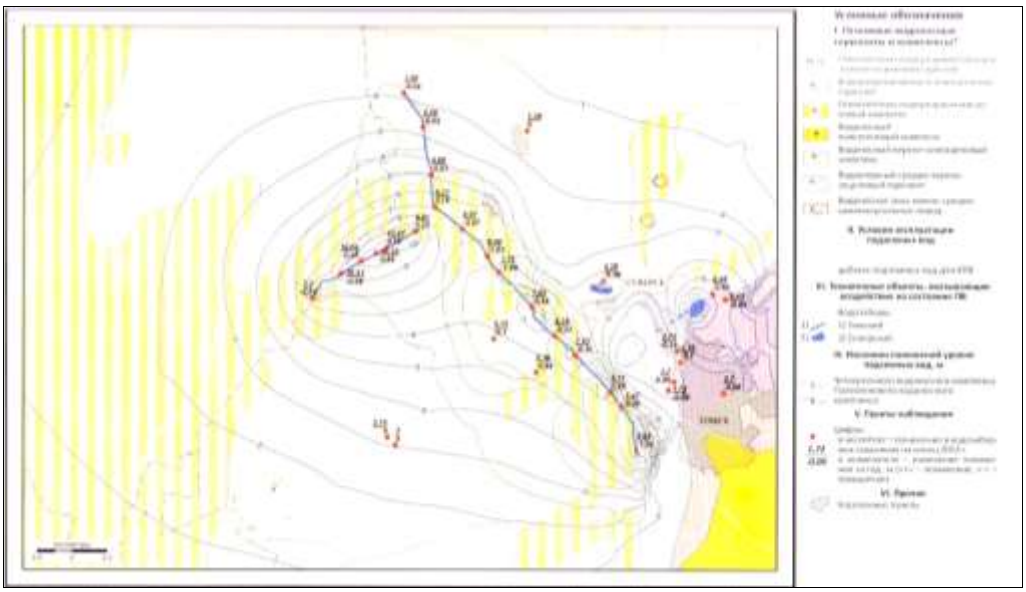

Figure 1. Schematic map of ground waters operational conditions in the influence zone of Tomsk water supply of ground waters (LLC «Tomskvodokanal») in 2013.

Underground water supply facilities complex occupies the territory equal to 5 Ha. There are 198 wells in operation, 93 of them are used in full-time service, and others are suspended. Well depth ranges from 80 to 198 meters, average daily water transport in the city is 136 000 cubic meters. In the city water is transported via two water pipelines. Tomsk water supply of ground waters consists of 2 linear series of water wells. Subsurface sites are situated on the territory of Tomsk region and Tomsk itself.

3. Problems

The interests of four main water consumers (Siberian Integrated Chemical Plant, Tomsk municipal enterprise of water supply, Seversk municipal enterprise of water supply and the general public) have come into conflict on the examined territory. As a result of these four water consumers' activities, two acute problems have arisen. The first problem is as follows: formation of a depression cone as a result of long water supply operation on the Ob-Tom interstream area and formation of a depression cone on the territory of Seversk water supply. For such cities as Tomsk, Seversk and surrounding rural areas the most important negative effects are hydrodynamic and hydrochemical changes in the characteristics of hydrosphere, phreatic decline, groundwater depletion and ground water pollution, changes of ground water run-off, occurring as a result of land settlement and transformation of natural landscape.

On the one hand, development of the depression cone causes water quality deterioration as a result of water exchange intensification due to the rates increase in inter-reservoir communication and waste water taking up [1]. On the other hand, soil drainage occurs, and, consequently, cropping capacity decreases requiring additional costs for irrigation and land improvement. As a result, agricultural complex bears losses as a missed profit.

The second problem is a subsequence of the first one: the waters of chalk (cretaceous) complex, which come in contact with buried liquid radioactive waste (LRW), may transfer into paleogenic complex. As a result of complicated hydrodynamics, the waters of chalk deposits discharge into paleogenic water-bearing stratum.

Therefore, we may assert that the joint impact of various factors is always stronger than the separate impact of each factor. This thesis is connected directly with the arrangement of land and property complex usage on the territory of the Tom lower course due to its multi-aspect value for the local community as far as enhancement of these factors may have a negative influence on the local population. Consequently, sustainable development of the considered urbanized territory depends, to a greater or lesser degree, on the correctness of a managerial decision. Life-supporting branches of municipal economy, particularly, the system of water consumption can not be developed separately without taking into account the system of land and property matters, economy and ecology. These constituents are an integral part of population's well-being.

4. Methods

The basis of the modern methods in the sphere of land and property matters state management under the conditions of forming and functioning market industry is the system of land payments. Firstly, it is implemented as taxes providing budgeting at all levels. Regulation of a land-value tax rate allows government directing, stimulating or, otherwise, hindering development of separate branches and territories. Land payments are very big and take the second place in the structure of own financial returns of business entities. As of 2013 they include 17 % - 35 % of all city returns in Tomsk [3]. The results of government cadastral valuation of lands are used as a taxation base in Russia connected with a land-value tax and

other payments for land. These results draw on the classification of lands according to their designated purpose.

5. Conclusion

Using as an example the cadastral valuation of Tomsk and Tomsk region lands, it is possible to make the following conclusion: the modern methods of cadastral valuation for land payments rating are imperfect. The main reason for a current situation lies in the initial choice of incorrect methodology: land taxation base is established by the authorities, who are responsible for the development of the given direction. International and Russian practices connected directly with land resources valuation are insufficient, what generates a need for detailed scientific and methodical elaboration of single elements in the above-mentioned valuation procedure. First of all, it is concerned with the development of basic parameters for valuation of subject property. These parameters should reflect a natural specificity of resources forming and the pattern of their utilization. Nowadays, land valuation is used only as a fiscal instrument in the land policy of the government, but valuation functions should not be limited by it. In order to make any managerial decision we need to have reliable data about one or another object and its degree of impact, i.e. functional valuation of territories is required, the aim of which is long-term social and economic well-being with a minimal environmental damage in relation to territories. This approach, in its turn, influences the environment and life quality of population and ecological balance with nature. Within the boundaries of the Tom lower course ecofriendly metabolic processes should be combined with functional stability of operating engineering systems for water resource utilization and military-industrial complexes, as well as for water-land property matters.

Taking into account the fact that the results of government cadastral land valuation (GCLV) influence the volume of payments for corporate and natural entities for the right to use the land, as well as on the revenue part of budget, in order to respect the interests of land proprietors and exclude the possible facts of budget mistreatment the following solution is offered. Such a group of factors as natural ones (especially, a water ecological factor), including hydrological features of the territory (ground water dynamics, presence of a depression cone), geological (geomorphologic) territory conditions, should be reflected in the GCLV results. In particular, these factors determine the size of missed profit speaking about agriculture, construction appreciation, repair costs at capital facilities operation, engineering and transport infrastructure. Also, they appear in increase or decrease in real property costs, the example of which may be found in carrying out valuation in Tomsk and Tomsk region, what, in its turn, influences the decrease in investment prospects in particular territories.

Problems of the underground water supply situated on the urbanized territory of the Tom lower course have already fallen beyond the scope of effortless speculations. It is necessary to make a decision on applying to these problems, but this issue is complicated by the absence of a unified managerial authority. Different interests of water consumers may be united with the help of establishing Water Consumers Association. This model of water resource management has been used in the USA (California) since 1960, in Spain – since 1985, in Uzbekistan – since 2002. Practices of these countries demonstrate that organizations of water consumers themselves allow making the most efficient decisions in water resource management, because they know the root of the problem firsthand. At establishing the organization of this type, it is possible to obtain constructive relations of water consumers in the task of water resource management. In order this Association to be successful in Russia, we need to start with forming environmental world outlook among population, because a

great number of water resources has led to the declension of moral upbringing. All the problems connected with water are perceived as a natural inevitable phenomenon. But that is not good enough. It is necessary to assimilate the standards of other countries in the system «water-community», which are successful at using the managerial model of Water Consumers Association. Association should take into consideration the interests of all water consumers. Its policy should not be temporary and it should not depend on a current situation. Its establishment is required for environment forecasting and problems elimination. In general, this organization should think forward and it should not be commercial, otherwise, it will lead to the development of corrupt practices. To provide the development of Water Consumers Association without breaking Legislation of the Russian Federation, special legislative and statutory acts need to be drafted, which regulate the activity of Water Consumers Association. Activity and services should not be taxed, because all the cash flow must be directed to maintenance of water supply systems and, if necessary, to accident response and water systems reconstruction.

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