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Reclamation of disturbed lands in the municipal district of Yekaterinburg city for sustainable development

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Abstract. The current issues of sustainability are determined by a vital task to combine economic interests with preservation of natural balance of the ecological system. In this context, the key measures to solve a problem of disturbed lands in the municipal district of Yekaterinburg city as one of the factors of unsustainability were proposed in the article.

1. Introduction

Standards of social and economic sustainability of lands aimed at preserving its natural capital make it possible to provide such a quality of life that meets the high requirements of the international community. However, the disturbed lands are one of the signs of unsustainability (its area in the municipal district of Yekaterinburg city is 1,337.64 Ha). It is noteworthy that the modern process of achieving sustainability is not adequately supported by the efficient methodological approaches and practical tools to meet the current ecological and economical challenges. It includes a legal mechanism of public regulation in the spheres of natural resources use, environment protection, and ecological safety

2. The urgent character of sustainability

It is difficult to define the subject of management in terms of a category of natural resources. On one side, the natural resources may be subject to private, state, municipal, and other forms of ownership (par. 2 article 9 of the Constitution of the Russian Federation), i.e. it may be not only state property. On the other, the constitutional law contemplates that it is a duty of the state to protect the natural resources as the basis of the life and activity (par. 1 article 9). That is, the state considers all resources as a national asset and undertakes to protect it as an element necessary for life in the state territory, regardless of the form of ownership of these resources.

The urgent character of sustainability-related issues is caused by the vital task to combine economic interests with preserved natural balance of the ecosystem. The efficient integration of Russia into the global economy and international market depends on a competitiveness level of its markets. In terms of this task, the technological leadership is one of the key factors of enhancing the efficiency of the markets. At first seem, the task to preserve the ecosystem stability is not supposed to be the critical one. However, it is obvious today that the unaddressed ecological problems can have a long-term effect, e.g. they can be reflected by the economic indicators. Since the negative environmental impact compromises a quality of natural and human resources, it assumes taking the coordinated actions in all the spheres of life and conducting structural reorientation of social, economic, and environmental institutions. It is worth pointing out that the task to develop sustainability is urgent not only for Russia, but globally. It is supported by the United Nations appeal to achieve sustainability standards in 2030.



Guidelines for sustainability under market conditions were documented by an order of the President of the Russian Federation dd. February 4, 1994 No. 236. The order provides the realization of rights established by the Constitution of the Russian Federation, namely the right of citizens to a favourable environment, the rights of future generations to enjoy the natural resources potential in order to maintain sustainability. It also provides a solution to current social and economic challenges in strong connection with the relevant measures to protect and develop environment, and to preserve and restore natural resources. They include:

- environmentally sound siting of labour forces
- environmentally safe development of industry, power production, transport, and public services
- environmentally safe development of agricultural sector
- sustainable management of renewable natural resources
- sustainable use of non-renewable natural resources
- increased use of secondary resources; recovery, processing, and disposal of wastes
- management development in a sphere of environmental protection, natural resource management, emergency prevention and control.

From a methodological point of view, the sustainability concept is considered as a target paradigm of management of economic systems, and it supposes the whole natural and economic complex of large territories (regions and municipal entities) with its traditional economic features to be the object of management. The Urals is one of the oldest mining regions in Russia, and it is one of the Russian regions with the largest volume of known and anticipated mineral reserves. It predetermined the extensive growth of ferrous and nonferrous metallurgy, construction, chemical production, extraction of mineral resources, including gold extraction. Broadly for this reason, there is a stable growing problem of environmental deterioration and degradation of living conditions for critical ecological indicators in the region. The land allocation for transport infrastructure facilities, urban development, waste landfills, tailing and waste dumps - all of these have a negative impact on the environment; the transport networks linking the localities increase the degradation of natural landscape [5] and the area of disturbed lands. The high percentage of disturbed lands is one of the factors of unsustainable regional development.

3. The disturbed lands of the municipal district of Yekaterinburg city

The current global estimates suggest that almost 3.7 billion people are living in cities today and the number is going to increase even further.[8],[1] In fact, for the very first time, cities have been given priority in the global development agenda, due to the progressive rise in the number of people living in urban areas (viz. by the end of 2050, two out of every three people will be living in cities), and because cities can play a defining leadership role in the management of issues like climate change, public health, and food security.[8],[1],[2] Over the next 15 years till 2030, the global community and the member states have committed to accomplish the proposed 17 sustainable development goals (SDGs)[8] and the one of them is SDG-11 which implies making cities and human settlements inclusive, safe, resilient, and sustainable.

The disturbed lands are the lands that lost its economic value, or the lands that are a source of negative impact on the environment due to disturbance of topsoil and hydrological regime, and formation of man-made relief as a result of production activities. In terms of the area of disturbed lands, Sverdlovsk region has occupied one of the leading positions among Russian regions during the last decade. According to the statistics, the area of disturbed lands in Sverdlovsk region was equal to 62,000 Ha in 2016, that is a 400 Ha (0.65%) increase compared to 2014 [6].

Distribution of the disturbed lands of Sverdlovsk region by land categories:

- Reserve lands 1364 Ha
- Forestry fund lands 27156 Ha
- Lands of specially protected territories and objects 248 Ha
- Agricultural lands 26722 Ha
- Residential areas 2790 Ha

- Lands of industrial and other special designation 3720 Ha

It is linked with the increasing area of disturbed lands within the area of lands of industry, power production, transport, communications, radio broadcasting, television, and information, and lands for ensuring outer space activity, lands of defense and security, and lands of other special designation. It can be explained by the reassignment of land plots to this category with the purpose of exploitation, as well as by the commencement of such works in the land plots granted previously (Revdinsky, Rezhevskoy, Nizhneserginsky, and Neviansky districts). Alongside with the exploitation, the land users perform the remedial actions to reclaimate the previously disturbed lands [3]. The department of the Federal Service for Supervision of Natural Resources for Ural federal district (Report No. 2-TP (Reclamation of lands) reports that the area of 56,160 Ha of disturbed lands was reclaimed in 2015 [3]. However, the reports on form No. 2-TP (Reclamation of lands) for the year of 2015 in Ural federal district were presented only by 237 enterprises [6].

The disturbance of lands within the municipal district of Yekaterinburg city is connected with the exploitation of construction materials, peat mining, terrain relief changes caused by unauthorized excavation, disturbance of land runoff, bogging, accumulation of construction, industrial, and domestic wastes.

The disturbance of lands is a result of natural and man-made processes (the latter prevails in Yekaterinburg city). These processes lead to the deterioration and/or destruction of soil and plant cover, and other quality changes in the state of lands. The man-made disturbance of lands is caused by mining operations, extraction of minerals, geological exploration, surveying, construction, and other works, as well as by operation of city services for residential area development. The category of disturbed lands includes also the degraded lands, where there is a stable decrease in quality and quantity of soil composition and its characteristics. This decrease is induced by the anthropogenic and natural-anthropogenic factors.

According to the data of Uralgeoproekt, LLC in 2011 the total area of disturbed lands in the municipal district of Yekaterinburg city was 1,337.64 Ha, that is equal to 1% of the new area of the municipal district of Yekaterinburg city. The stated area is 6.5 times larger than the lands of specially protected territories and objects. Relative to the land categories, these figures are:

- 8% of the agricultural lands
- 18% of the lands of industry, power production, transport
- 5% of the forestry fund lands
- 30% of the water fund lands

The total area of disturbed lands includes:

- 621.4 Ha of cuts
- 402.9 Ha of fills and piles
- 34.9 Ha of settlers
- 25 Ha of solid waste landfills
- 193.45 Ha of boggy areas
- 60 Ha of sludge reservoirs

The disturbance extent of lands of the municipal district of Yekaterinburg city can be expressed in terms of Disturbance coefficient that is equal to 1.17% (the coefficient is calculated as the ratio of the total area of disturbed lands to the area of the municipal district of Yekaterinburg city).

The monitoring of the disturbed lands of Yekaterinburg city shows that the disturbance extent of city districts varies from 0.98% to 1.52%. The disturbance extent is:

- 0.98% in Oktyabrsky district
- 1.3% in Ordzhonikidzevsky district
- 1.32% in Chkalovsky district
- 1.4% in Verkh-Issetsky district
- 0.41% in Zheleznodorozhny district
- 1.5% in Leninsky district

- 1.52% in Kirovsky district.

The key problem of land protection is the non-compliance with legal requirements that regulate the restoration of lands disturbed as a result of operational activity. A way the disturbers compensate damage caused to the lands as to the object of environment protection, it is an important tool that prevents and represses violations of the land legislation, and it characterizes the efficiency of state land supervision [5]. Article 13 of the Land Code of the Russian Federation dd. October 25, 2001 No. 136-FZ (rev. dd. July 3, 2016) (as amended , effective as of January 1, 2017) sets forth the responsibility of owners, landlords, tenants, and other land users to reclaimate the disturbed lands, to restore the topsoil, to rehabilitate the lands in timely manner.

4. The key measures for solving a problem of disturbed lands

It should be noted that the legislation of the Russian Federation was deeply amended for the last several years, and these changes help to gradually solve the problem of disturbed lands. Firstly, the administrative fines for non-fulfillment or untimely fulfillment of obligations to reclaimate lands were increased. According to art. 8.7 of the Administrative Offenses Code of the Russian Federation (as amended by Federal law dd. March 8, 2015 No. 46-FZ), such nonfulfillment or untimely fulfillment of obligations leads to an administrative fine ranging from twenty thousand to fifty thousand rubles for citizens, from fifty thousand to one hundred thousand for officials, and from four hundred thousand to seven hundred thousand for legal entities. Until recently, the administrative penalty for nonfulfillment of obligations to reclaimate lands was not so strict (a fine was from one thousand to one thousand five hundred rubles for citizens, from two thousand to three thousand for officials, and from forty thousand to fifty thousand for legal entities), that contributed significantly to the negligence in fulfillment of the obligation set forth in art. 13 of the Land Code of the Russian Federation. Secondly, Federal law dd. December 28, 2016 No. 488-FZ On Introducing Amendments to Certain Legislative Acts of the Russian Federation also contributes to the tightening of penalties for a breach of obligations to reclaimate lands, since it allows the creditors to make the subsidiary liability for entity's debts be hold by a person, authorized by law or other legal or constituent instrument to act on behalf of a debtor. Therefore, the liquidation of a legal entity is not a probable cause to avoid responsibility. Thirdly, there appeared a possibility to use strip mining, host rock, waste from ferrous metals production of hazard classes IV and V in course of the liquidation of mine workings according to a project of mine workings liquidation (art. 11 of Federal law On Production and Consumption Waste dd. June 24, 1998 No. 89-FZ).

However, the use, allocation, and reallocation of land resources on a city scale have its own significant features. The urban land use is multifunctional; it is a clash of land and property interests of different economic sectors, the interests of municipal services, individual land owners, landlords, land users, tenants of land plots. The regulations on use of lands of different types are applicable simultaneously in the cities, but the urban development regulations are considered as of primary importance. On a city scale, there should be a balance between the citizens' needs for comfortable life conditions and natural resources preservation [7].

These issues are current for the city of Yekaterinburg. The projection of monitoring of the disturbed lands in 2008-2011 shows that the area of disturbed lands in the municipal district of Yekaterinburg city was reduced slightly. In general it is caused by:

- unauthorized waste disposal or soil excavation
- formation of waterlogged and boggy areas due to the "patch" construction with no complex approach to the surface runoff drainage
- growth of the area of the city in 2008-2011
- and abandoned deposits, since at the end of an agreed period of works the license holders usually go bankrupt or disappear or sell a deposit to the firms that have no funds to reclaimate it.

Furthermore, the current legislation does not consider the growth of city area. For example, par. 5, art. 12 of Federal law On Production and Consumption Waste dd. June 24, 1998 No. 89-FZ prohibits the waste disposal within the inhabited localities. But the growth of city area leads the new territories

to be developed for the periods much shorter than the lands need to be reclaimed, so the life conditions become worse thereafter.

The role of the municipal authorities in the reclamation of lands is restricted in an explanation of ruling of the Constitutional Court of the Russian Federation dd. October 13, 2015 No. 26-P. The position of the Constitutional Court of Russia on the responsibility for disturbed lands is defined in par. 24, part 1, art. 16 of Federal law On the General Principles of the Organization of Local Government in the Russian Federation. It does not provide the liability of the local government authorities of urban districts to liquidate an unauthorized disposal of domestic and industrial waste, left by unidentified person in the land plots, at the expense of local budget, and it does not authorize the local government authorities with the relevant state powers.

Thus, the subjects of business and other activities that have a negative impact on the environment must bear the full costs of its reclamation. If a person guilty of damaging is unidentified, the reclamation of the relevant land plots is performed by its proprietors. The registered owners have both a right and an obligation to preserve lands that is stipulated by law.

The disturbed lands of the municipal district of Yekaterinburg city are subject to the different forms of owner-ship: private lands, municipal lands, and lands of the Russian Federation. The abovementioned ruling is sup-posed to explain the low figures of target performance indicator of a municipal program, regulating the land resources management in the municipal district of Yekaterinburg city in 2017-2020. This target performance indicator reflects the area of disturbed lands, and for the indicated period it should be equal to 24 Ha, i.e. 6 Ha per year or approximately 1.8% of the total area of disturbed lands in the city.

– To sum up, considering the need to achieve sustainability the following measures can be recommended to solve the problem of disturbed lands:

- To formalize by law the audit of the disturbed lands of regions, cities, and towns
- To create a unified data base, the use of which should also be reflected in law
- To capture in law a supervision of reclamation of disturbed lands and an extension of monitoring after a completion of project of its reclamation
- To tighten penalties for failure to submit a report of form No. 2-TP (Reclamation of lands)
- To determine a list of waste, non-toxic and of hazard class 5, for reclamation of disturbed lands and to justify its possible use in the inhabited localities.

The following recommendations for the municipal authorities should be indicated:

– To enhance the general urban plan of Yekaterinburg city with the zones of disturbed areas that need to be reclaimed

– To reclaimate disturbed lands and rehabilitate it according to the urban planning zones of the municipal district of Yekaterinburg city, to begin with disturbed areas in the territories intended for building

– To organize monetary funds for the reclamation of disturbed lands with the local government authorities, in compliance with the projects of deposit mining and waste disposal. Then these funds should be used for its intended purpose to reclaimate the disturbed areas under super-vision of the local government authorities

– To prepare the lands, that is to drain the peat bog areas and to backfill peat long before selling these lands to the developers. The costs of these activities should be then included in a selling price.

owners, landlords, tenants, and other land users to reclaimate the disturbed lands, to restore the topsoil, to rehabilitate the lands in timely manner.

5. Conclusion

Today the objectives of sustainability define the present and future quality of life, thus the economic development of territories should be long-term, environment-friendly, and multi-tasking. To achieve sustainability is the most critical challenge for the entire world, including the Russian Federation. Its

solution will be facilitated by driving attention and interest to the indicated problems of the state and municipal authorities, and the citizens of the state.

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