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ANALYSIS OF STATE LAND TO ASSESS THE TRANSFORMATION OF ECOSYSTEMS IN THE TERRITORY IN ABSHERON ECONOMIC REGION OF AZERBAIJAN

ANÁLISIS DE LAS TIERRAS ESTATALES PARA EVALUAR LA TRANSFORMACIÓN DE LOS ECOSISTEMAS EN EL TERRITORIO DE LA REGIÓN ECONÓMICA DE ABSHERON EN AZERBAIYÁN

Mammadov Malikmamed Khanoglan Ogli[1]
E-mail: nargiz.guluzade@mail.ru
ORCID: https://orcid.org/0000-0002-6356-2882
[1] Azerbaijan State Pedagogical University. Azerbaijan

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ABSTRACT

The aim of this work is to evaluate the transformation of ecosystems in the territory of the economic region of Absheron, Azerbaijan. For this, methods from the geographical sciences were mainly used. The environmental and geographical assessment was carried out based on the analysis of the state of contaminated soils in the former oil gas zones acquired in the economic region of Absheron. The geographical distribution of the contaminated lands, their forms, typological classification and optimal directions of revegetation of the contaminated lands and types have been defined for the region. It is notable that the analyzed region has a large population, so the consideration of social factors or impacts has a high weight in the analysis of possible strategies for territorial planning.

Keywords:

Production of oil-gas construction materials, contaminated lands, revegetation, type, sub-type, areal.

RESUMEN

El objetivo de este trabajo es evaluar la transformación de los ecosistemas en el territorio de la región económica de Absheron, Azerbaiyán. Para ello se usaron principalmente métodos provenientes de las ciencias geográficas. La evaluación ambiental y geográfica se realizó basado en el análisis del estado de los suelos contaminados en las antiguas zonas de gas petrolero adquiridas en la región económica de Absheron. La distribución geográfica de las tierras contaminadas, sus formas, clasificación tipológica y direcciones óptimas de revegetación de las tierras y tipos contaminados se han definido para la región. Es notable que la región analizada tiene una gran población por lo que la consideración de los factores o impactos sociales tiene un elevado peso en el análisis de posibles estrategias para la planificación del territorio.

Palabras clave:

Producción de materiales de construcción de petróleogas, tierras contaminadas, revegetación, tipo, subtipo, areal.

INTRODUCTION

The Absheron economic region is characterized by a wide variety of minerals. The region is not territorially limited by the boundaries of the oil and gas region of the same name with its numerous onshore fields and the adjacent waters of the Caspian Sea but it also covers a part of the Shema-khi-Kobustan oil and gas region within the South-East Kobustan, as well as a narrow coastal strip of the Caspian-Kuba and Prikurinsk regions. However, oil and gas production and their reserves for the economic region are mainly associated with oil and gas fields in the Absheron region. Surface manifestations of oil and gas on the Absheron Peninsula have been known for a very long time. Back in the Middle Ages, oil was extracted from wells in the Balakhany area, as well as from the outcrops of oil-bearing strata. Surakhany Square is famous for the outlets of combustible gas and "eternal fires", where a medieval temple of fire worshipers is still preserved.

Large-scale oil production on the Absheron Peninsula began in the 70s of the 19th century, boreholes were laid at oil wells or at oil outcrops without taking into account the geological structure of the sites. To date, there are up to 27 hydrocarbon deposits onshore in the Absheron oil and gas region. The development and operation of oil fields is one of the leading factors in the transformation of the natural environment of the Absheron economic region, therefore, the assessment of its transformation is an urgent task to ensure the environmental safety of the region.

One of the methods for assessing the transformation of ecosystems is a component-wise approach, in which the state of individual natural components is assessed: the geological environment, atmospheric air, ground and surface waters, soil cover, vegetation cover, soils, etc. The continuation of these works allow monitoring the response of ecosystems to technogenic impacts over longer periods of time and assessing the impact of changes in the technology of the oil production process and the effectiveness of environmental protection measures on the ecological state of the area. That's why this type of study assessed not only the transformation of the soil cover and surface waters on the territory of various fields over a period of longer periods of time, but also the use of data analysis to assess the transformation of ecosystems.

Then, the goal of this study was to assess the transformation of ecosystems in the territory of Absheron economic region. Pollution studies of natural components on the territory of the deposits were carried out between 1995 to 2013. In the study were applied methods used in geographical science like: systemically - structural analysis, comparative - geographical analysis, statistical analysis and cartographic analysis.

DEVELOPMENT

In the Absheron economic region, the specifics of the interaction of the natural environment and the production developing on the basis of the use of natural resources, first of all, was associated with the huge intensive load on the natural environment of the territorial concentration of fixed assets of production activities. Key economic and environmental problems of the region are mainly related to the territorial-production complex, which was formed through the use of oil and gas production, various construction raw materials. At the same time, intensive development on the territory of production, high population density, high proportion of urban population establish the importance of economic and environmental measures in the area (Mamedov, 2007).

The study of some patterns of distribution of oil, gas and building materials resources, factors influencing the occurrence of environmental problems in the area, allows you to determine the areas of distribution of lands contaminated in the process of their extraction. Onshore oil and gas production in the Apsheron economic region is associated with the Apsheron oil and gas bearing region of the same name. The region includes the Apsheron peninsula, the Apsheron archipelago located to the east of the peninsula and the zone of the islands of the Ba-kinskaya bay in the south. It resembles a rectangle with a length of 130 km and a width of 85 km. This area has been comprehensively studied from a geological point of view.

The raw material base of the oil and gas producing industry in the Apsheron economic region differs from other oil and gas producing regions of the world in its specific features. Here, oil and gas fields differ in that they are compact and are located on a relatively small territory; in fact, there are no free areas between them. Onshore in this area there are up to 27 oil and gas fields. The organization of industry on the territory of the district is also distinguished by the combination, on a compact territory, of production sites with wide production ties and a certain specialization. Most of the territory was polluted due to the extraction of oil, gas, hazardous chemicals, as well as highly saline underground formation waters from deep layers of the earth during extraction. As a result, an economic and ecological situation (contaminated land) arose on the territory of the district. A detailed study of the patterns of occurrence of such an economic and ecological situation requires an analysis of the functional structure of the territory (Gurbanzade, 2010).

One of the main issues of economic and environmental problems in the Apsheron economic region is to determine the sources of impact on land for the economy of the oil and gas industrial complex. The choice of the most effective organizational, technological and constructive work for the remediation of contaminated land becomes rational only when negatively affecting sources and their impact on the land for the land economy are correctly identified. And this creates favorable conditions for determining the subtypes of contaminated lands and areas of their distribution.

Industrial enterprises operating in the area for many years have admitted gross mismanagement. As a result of the lack of metal tanks for re-supplying water, containers for transportation and collection of excavated slag in the areas where drilling work was carried out at one time, drilling fluids and technical water in most cases were stored in pits. Slags and chemical reagents thrown into the territory contributed to the pollution of the land. In many places, after dismantling of derricks from non-operating wells, their concrete foundations remain. And this, in turn, creates certain obstacles in the implementation of reclamation work on contaminated land in this area.

Based on a comprehensive analysis of data on land pollution in the economic region, it was established that negative impacts on land are the following sources of production processes: 1) exploration of oil and gas fields and drilling of wells; 2) construction of transport roads between production facilities; 3) exploitation of fields - oil and gas production; 4) transportation of oil and gas; 5) extraction of building materials.

A comprehensive analysis of production processes shows that during the development of oil and gas fields, the negative impact on land occurs at three stages: during geological exploration, construction work, and field operation. Here, the negative impact on land plots by its nature occurs in two directions. First, it is the negative impact depending on the technological environment. This influence can be eliminated through the use of effective methods in the course of field development. Secondly, there is the negative impact of oil and gas waste on the natural environment - on land due to emergency situations that have arisen during mining. In case of improper use of technological processes during the exploitation of oil and gas fields, their production, transportation and conservation, the elements of the natural environment are subject to greater damage.

The studies carried out show that in the region most of the lands were negatively affected. The soils have been contaminated by toxic chemicals as well as slag contained at drilling fluids, waste water and flushing fluids. Also, there is oil pollution within the territory in various volumes. Soils in the fields located on the territory of Bilajar are polluted in depth10 cm from the surface, and in some areas the pollution reaches 15-20 cm, even up to 50 cm. In the fields of Bina and Buzovna, the thickness of the oil-contaminated soil layer reaches 50-60 cm. In some parts of the region, the thickness of the contaminated land is more than 100 cm. Oil absorption into deeper strata is more noticeable in the Binagadi, Bina, Buzovna and Yasamala fields.

The results of a number of analyzes carried out on the oil-polluted lands of the economic region show that during soil pollution, the ratio between carbon dioxide and nitrogen contained in it immediately increases, which worsens the nitrogen regime in the soil and prevents plant roots from feeding (Mamedov, 2013). Oil spilled on the surface of the earth penetrates into deeper layers, even heavily pollutes groundwater and soil, as a result of which the fertile layer of the earth cannot be restored for a long time. Crude oil, thrown into the natural environment, penetrates the soil horizons, closes porous areas and kills microorganisms in the soil. There is no oxygen in such soils and it can be said that the degradation process does not take place in them. The penetration of crude oil into the depths of the soil horizons depends on soil moisture and drainage conditions.

Analysis of the technical and economic factors of oil field exploitation shows that the most effective among them is the method of artificial stimulation of reservoirs. Onshore oil fields in Azerbaijan use the method of stimulation by pumping water into strata, which is the most used. About 85% of the oil produced is obtained from fields where water is pumped into the reservoirs from different directions. In the oil fields of Sabunchi and Binagadi, using the method of injection into reservoirs, oil production from reservoirs is increased. For the injection of water into reservoirs, they mainly use formation waters extracted from wells.

From water wells, water enters the combined compressor and pumping station, then from there it is given to injection wells. To extract one ton, 1.9 tons of water are injected into the strata. Oil wells are one of the elements of the oil and gas production complex. The flow rate of each specific well in the region is 5-7 tons per day. Oil under the influence of intra-formation pressure enters the surface. Statistical data show that for the production of one ton of oil in the fields, the consumption of electrical energy is 10-15 kW / h. If we take all work in the course of production as 100%, then we will see that 1/3 of the work is completed by electricity, and 2/3 by reservoir energy. Oil from oil wells enters group metering units, then - to a booster pumping station. Oil production from a theoretical point of view

follows a closed circuit, however, from a practical point of view, it has invisible waste, which is more striking when the fields are put into operation. For this purpose, pits and emergency tanks with a volume of 200–300 m^3 are being dug near the deposits; for this purpose, they also use deep relief forms. In the Absheron economic region, highly mineralized formation waters also have a strong impact on the natural environment - on land. Reservoir and waste waters of oil fields differ in physical and chemical properties and composition. The high content of harmful substances in the composition of strata and waste waters has a stronger effect on the soil and vegetation (Imanova, 2007; Mamedov, 2014).

It should be noted that a visible negative impact on the natural environment, especially on the land cover, was rendered in the area by vehicles, tractors, excavating processes, pipelines, and others that were haphazardly moving within the oil and gas fields. Also, when transporting oil and oil products through a pipeline, huge impacts on the elements of the natural environment occurred mostly caused by corrosion and accidental rupture of the pipelines.

Analysis of the impact on the natural environment of the oil and gas complex of the area under study, in particular during the extraction of oil, gas and building materials, allowed to establish areas of distribution of contaminated lands. Nevertheless, it was very difficult to determine the total area of contaminated land in the district primarily due to the widespread development of oil and gas production in different parts of the region and because the variety of methods used during the extraction of oil and gas reserves formed a large amount of contaminated soils.

When determining the plots of contaminated land in the Absheron economic region, it was taken into account the land contaminated with oil, covered with fuel oil and bitumen, land with depressions, pits filled with oil and stratal waters, dumps, garbage dumps, ash land, flooded, wetlands and contaminated in other the shape of the land, as well as the area of these lands, the degree of their pollution, their depth and other features. In most cases, data on the areas of contaminated land in the economic region were widely presented, which did not correspond to each other and were of a special and estimated nature. According to the former Azneft, the predecessor of the State Oil Company of the Azerbaijan Republic (SOCAR), 17.2 thousand hectares of land were contaminated only in connection with oil and gas production. In other sources, the total area of all types of land in the economic region is indicated as 25 thousand hectares (Hasanov, 1977) and 33 thousand hectares (Mamedov, 2013).

In the course of this research, it was found that the negative impact of the oil and gas industrial complex on the natural environment - the land cover, was formed depending on the production process itself. As a result of the impact of the extraction of oil, gas and building materials, as well as other products, lands contaminated in various forms were formed on the territory of the region. According to the calculations, the total area of contaminated land in the district is more than 21 thousand hectares, of which: 19 405 hectares were contaminated by oil and gas extraction, 1079 hectares during the extraction of building materials and 845.8 hectares were polluted by other activities.

One of the other sources that create economic and environmental pressure in the Apsheron economic region is the extraction of construction materials in the region, industrial, construction and household waste. Lands polluted as a result of the impact of these sectors of the economy are found mainly in sandy, gravel, clay and stone quarries, in construction projects for various purposes, in the construction of overground and underground linear communications. As a result of construction work and the opening of quarries, the upper fertile layer of the earth mixes with the lower layers and its physical and chemical properties are disturbed. The main constituent elements of soil-ground masses formed on the surface of hard rocks and soft clay rocks fluctuate between the following quantities: humus: 0.14% - 1.19%, carbonates: 10.5–34.9%, absorbed alkalis: 21.3-26.7 mg.eq., phosphorus - 3.6-11.4; potassium - 82.4-196.3 mg / kg (Hasanov, 1998). At morphogenetic indicators of lands contaminated with industrial, construction and household waste, humus is characterized by a high content: 0.24-1.96%. The amount of carbonates is 6.56-23.81%, absorbed alkalis: 18.2-24.9mg equivalent, phosphorus - 4.2-18.2; potassium - 75.1-279.8 mg / kg (Hasanov, 1998). These lands can be found throughout the area. Thus, being one of the important conditions for their reclamation morphogenetic features are of particular importance in predicting the process of soil formation in this territory after reclamation.

Reclamation of contaminated lands in the territories of oil and gas production and their use in various sectors of the economy, in general, are closely related to the rational territorial organization of production. From this point of view, the typological classification of contaminated lands was also analyzed as the main task of economic and geographical research. However, it should be noted that the typological classification of contaminated lands has been little studied by economic geographers.

Typological classification creates the necessary basis for the development of projects that ensure socio-economic development in contaminated areas. It provides standardization in different systems of lands polluted as a result of the impact of certain industries and the creation of mutual relations between these different systems.

Azerbaijani scientists, carrying out reclamation on lands contaminated as a result of the impact of industry, pay great attention to a comprehensive study and typological classification of contaminated lands in order to form more rational territorial-production complexes in those areas. Based on the study of contaminated lands in the Absheron economic region and a comprehensive analysis of the collected materials, it is given a typological classification of contaminated lands. The main taxonomic unity in a typological classification is type and subtype. The following types of contaminated land have been identified in the area:

A 1 - land, contaminated by fuel oil

A 2 - ground, contaminated bitumen

A 3 - land, contaminated drilling waste

A 4 - land, submerged fishing waters, wetlands

A 5 - ground, contaminated vehicles, irregularly moving within the oil and gas industries

V 1 - earth, polluted by landfill and ashes

This convenient typological classification makes it possible to take into account the complex indicators of contaminated land, in contrast to other classifications, as well as to establish the areas of contaminated land in the republic. Thus, the analysis of singularities morphogenetic sources, acting on the land pollution, areas of contaminated land, and spread in the test area will integrate be contaminated area of ground to 7 subtypes. A study of the spread of contaminated land areas for oil and gas fields area revealed, that not all subtypes were distributed equally. Some subtypes are found everywhere, and some differ in local and sectoral distribution, as well as in the degree of pollution.

Economic-geographical analysis reveals a variety of subtypes of contaminated land in the territory and the presence of certain differences in meeting the various needs of economic sectors located nearby. All this makes it possible to determine the possible directions of reclamation by subtypes of contaminated lands and the distribution areas of their species. The patterns of distribution of contaminated lands of different subtypes within the possible directions of reclamation by subtypes of contaminated lands and distribution areas of their species (we have identified 6 areas) depend on the natural, economic and historical conditions of the territory. Areas identified from this point of view were named in accordance with the territories of oil and gas fields.

- Within the range Sabunchi-Ramana, such subtypes of polluted lands as A1, A2, A3, A4, A5, V1 are widespread. The area of contaminated land by subtype is 3587.5 hectares, which is 16.3% of the total area of contaminated land in the district. Possible directions and types of reclamation by subtypes of contaminated land within the area is considered agricultural (arable land, horticulture, viticulture, olives, saffron, vegetable garden - vegetables); forestry (soil protection, sanitary protection); water management (ponds for raising fish, birds); recreational (recreation areas, sports pools); construction (civil and industrial buildings) sanitary and hygiene.
- Within the range Bibiheybat-Patamdar, such subtypes of contaminated lands as A1, A2, A3, A4, A5, V1 are widespread. The total area of contaminated land for all subtypes here is 1880 hectares, which is 8.8% of the total area of contaminated land in the district. Possible directions and types of reclamation by subtypes of contaminated land within the area is considered forest (soil protection, sanitary protection); recreational (recreation areas, sports pools); construction (civil and industrial buildings) sanitary and hygiene.
- Within the range Buzovna-Mashtaga such subtypes of contaminated lands as A1, A3, A5, V1 are widespread. The total area of these lands is 39,938 hectares, which is 18.7% of the total area of spoiled land in the district. Possible directions and types of reclamation by subtypes of contaminated land within the area is considered agricultural (arable land, horticulture, viticulture, olives, saffron, vegetable garden

- vegetables); forestry (soil protection, sanitary protection); water management (ponds for raising fish, birds); construction (civil and industrial buildings); recreational (recreation areas, parks, sportsbasses and playgrounds) sanitary and hygiene.

- Within the Binagadi areaSulutepe, such subtypes of contaminated lands as A1, A3, A4, A5, V1 are widespread. The area of contaminated land for all subtypes is 3721 hectares, which is 17.9% of the total area of contaminated land in the district. Possible directions and types of reclamation by subtypes of contaminated land within the area is considered agricultural (arable land, horticulture, viticulture, olives, saffron, vegetable garden - vegetables); forestry (soil protection, sanitary protection); water management (ponds for raising fish, birds); building (civil and industrial buildings) sanitary-hygiene.

- Within the area of Surakhany-Garachukhur, such subtypes of contaminated lands as A1, A2, A3, B1, V1 are widespread. The area of contaminated land by subtype is 2501.5 hectares, which is 11.7% of the total area of contaminated land in the district. Possible directions and types of reclamation by subtypes of contaminated land within the area is considered agricultural (arable land, horticulture, viticulture, olives, saffron, vegetable garden); forestry (soil protection, sanitary protection); water management (ponds for raising fish, birds), sanitary and hygiene.
- Within the range Garadagh-Yasamal, such subtypes of contaminated lands as A1, A3, A4, A5, B1, V1 are widespread. The area of contaminated land by subtype is 5636.4 hectares, which is 26.4% of the total area of contaminated land in the district. Possible directions and types of reclamation by subtypes of contaminated land within the area is considered agricultural (arable land); forestry (soil protection, sanitary protection, special landscaping); water management (reservoirs, ponds for raising fish, birds); building (civil and industrial buildings) sanitary-hygiene.

Allocation of possible directions and types of distribution of remediation areas by subtypes of contaminated lands in the studied Absheron economic region in theoretical terms allows us to make the following conclusion:

- Areas allocated according to possible directions and types of reclamation in different subtypes the contaminated lands of the district, reflecting the placement of reserve sites, can be used during the planning of the territory for reclamation work. Including for the restoration of the environment, the difficulty of their technical preparation and the approximate ratio of the capital and labor capacity of reclamation are determined.
- Areas allocated according to possible directions and types of reclamation in different subtypes contaminated land, allows you to choose the best options for reclamation in the area and establish their economic efficiency.

Thus, most (75%) of the land contaminated as a result of the impact of the oil and gas industrial complex in the Absheron economic region can be considered as reserve sites to meet the needs of the economy through reclamation.

The main of the necessary elements of the comprehensive nature of the reclamation of lands contaminated as a result of the impact of the oil, gas and building materials industry, as well as other forms of economy, is the creation of an excellent environment for the life and economic activities of society, as well as obtaining the greatest economic effect on the restored lands. Of course, the implementation of such activities requires high costs. The costs incurred for activities carried out in the field of remediation are included in the capital investment. Therefore, the analysis of data on the costs spent on reclamation works is essential in determining the economic efficiency of these works.

When determining the costs spent on reclamation work, the condition of the contaminated land and the timing of the work to be performed should be taken into account. If reclamation work is carried out on contaminated land, where oil and gas production is currently stopped, then the costs of all complex reclamation work are determined from the capital investment allocated for the restoration of natural resources at the expense of the state budget. If the reclamation of damaged lands is carried out simultaneously with oil and gas production or immediately after exploration, then the costs are determined not at the expense of capital investment, but directly at the expense of the operating costs of that enterprise.

Analysis of data from various sources on the costs spent on the remediation of contaminated land shows that the volume of costs spent on the remediation of 1 hectare of contaminated land varies from several hundred to several thousand dollars. The costs spent on the remediation of contaminated land in Azerbaijan varies from 9350 man / ha (in the direction of agriculture) to 4235 man / ha (in the forest direction), and in other directions up to 3450 man / ha. In general, the costs spent on the reclamation of 1 hectare of contaminated land averaged 5230 man / ha. Calculations made according to regulatory documents show that the costs spent on reclamation of lands contaminated by oil and gas production range from 4690 man / ha (for pastures and meadows) to 8950 man / ha (in the direction of arable land)

The amount of expenses spent on reclamation work in the Apsheron economic region, first of all, depends on the geographic characteristics of the territory (relief, geological, hydrological and soil conditions, development, use of the territory, etc.), the method of oil production and gas, the degree of provision with the equipment of the enterprise that conducts reclamation, as well as from the directions of reclamation and from other factors. And the difference in the amount of expenses spent on reclamation work depends on the development of a subtype of contaminated land. 70-90% of the total cost of the reclamation work carried out in the area are the costs spent on the technical stage. The technical stage includes the costs of cleaning the territory from inactive wells, their platforms, unused pipes, planning works on the territory, moving in some places of fertile layers and other costs. The costs spent on these works are on average from 520 man / ha to 8940 man / ha, depending on the volume of work done.

In biological reclamation, the largest amounts are spent on creating fertile soil layers. The costs are calculated on average from 420 man / ha to 3750 man / ha. According to our calculations, the highest costs in the agricultural direction are 8940 man / ha, and the lowest costs in the construction direction - 450 man / ha. The costs are calculated on average from 420 man / ha to 3750 man / ha. According to our calculations, the highest costs in the agricultural direction are 8940 man / ha, and the lowest costs in the construction direction - 450 man / ha. The costs are calculated on average from 420 man / ha to 3750 man / ha. According to our calculations, the highest costs in the agricultural direction are 8940 man / ha, and the lowest costs in the construction direction - 450 man / ha .

The amount of both costs spent on technical reclamation and costs spent on biological reclamation is calculated conditionally. A significant variation in the amount of expenses spent on reclamation work in the district is explained not only by different conditions of reclamation, but also by the lack of a unified system of indicators and calculation methods.

One of the main questions posed by the study is the expansion of the area of soil reserves of one type, restoring them through the reclamation of contaminated land in the region. Therefore, at this stage, from a number of targeted reclamation options, the most economically effective directions and types of reclamation are distinguished, which, in specific conditions, can be considered as the optimal directions of reclamation. The economic efficiency of contaminated land in an economic region should be determined according to the justification of ecological, technical, socio-economic calculations. The basic principle of the calculations is to compare the specific costs spent on comprehensive measures for the remediation of contaminated land.

Analysis of the data on the economic efficiency of remediation of contaminated land in the Apsheron economic region allowed us to choose the most effective options for directions and types of remediation from an economic point of view. The assessment used technogenic factors, geographical conditions of the analyzed above contaminated lands, as well as indicators of costs spent on their reclamation. In this regard, all environmental, economic and social factors within the entire area of the contaminated lands of the district were studied in a comprehensive manner.

As a result, indicators of the magnitude of the average annual effect obtained from the development of contaminated land in different directions, in the year of completion reclamation works vary between 320 man / ha and 9350 man / ha. For the region, the most effective industries are arable land, viticulture, water management, and recreation. Among ineffective industries is the direction of sanitation and hygiene. Accounting for the calculated time between the costs spent on reclamation work and the resulting effect, and indicators of economic efficiency establish the compensation period from 1 year to 22 years. The most effective industries are the areas of recreation, water management, special landscaping, construction, the most ineffective are the direction of forage crops.

An analysis of the most effective directions and types of reclamation within the areas identified by subtypes of contaminated land shows that the most optimal options for most areas identified on the basis of spoiled land in the district are agriculture (arable land), forest (landscaping); water management, recreation, construction and sanitary hygiene.

Thus, the ecological and economic-geographical nature of the research work carried out makes it possible to study the provision of the district with land, the possibility of differentiating the territory by subtypes and optimal variants of contaminated lands. As a result, the identified areas of the contaminated lands of the region were divided into two groups. The first group includes spoiled land located within and near settlements. The second group consists of contaminated lands, located partly at a distance from settlements. Here, calculations were made to select the optimal directions for reclamation, corresponding to the local conditions of the territory.

CONCLUSIONS

A comprehensive study of the problems created by the negative impact on the natural environment of the production complex, the emerging industry of oil and gas production and construction materials in the Absheron economic region, shows the versatility and complexity of the questions posed. There is no doubt that this requires a methodological approach to their solution in connection with the principles of complexity, as well as the need to apply the methods of system analysis. Since the main goal of the study is the restoration of contaminated lands, reclamation work and the choice of their optimal directions and types, complexity forms the basis of the study. Therefore, the work often notes the importance of an integrated approach in the methodology of economic and geographical analysis of restoration of recultivation of contaminated lands.

The choice of the optimal reclamation options in contaminated lands is determined by physical, economic, social, geographical, technical and other factors. The value of

each factor is associated with the conditions of the area. Physical, economic, social, geographic, technical and other factors play an important role in the mutual relationship of natural and socio-economic systems. Due to the denser population of the area, social factors are essential in planning the territory.

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