ECOLOGICAL AND ECONOMIC ASSESSMENT OF THE TERRITORY FOR THE PURPOSE OF IMPROVING THE LAND USE STRUCTURE

ЭКОЛОГО-ХОЗЯЙСТВЕННАЯ ОЦЕНКА ТЕРРИТОРИИ С ЦЕЛЬЮ СОВЕРШЕНСТВВНИЯ СТРУКТУРЫ ЗЕМЛЕПОЛЬЗОВАНИЯ

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Abstract: The article examines the main issues of ecological and economic assessment of the territory. Ecological and economic assessment of the territory is an interdisciplinary approach aimed at integrating ecological and economic criteria in planning, development and protection of lands. Such analysis is the basis for making management decisions aimed at sustainable development of territories. This approach combines elements of geoecology, economics of nature management and land management, allowing to assess the ability of the territory to reproduce natural components while simultaneously meeting economic needs.

Аннотация: В статье рассматриваются основные вопросы эколого-хозяйственная оценка территории. Эколого-хозяйственная оценка территории представляет собой междисциплинарный подход, направленный на интеграцию экологических и хозяйственных критериев при планировании, освоении и охране земель. Такой анализ является базисом для принятия управленческих решений, направленных на устойчивое развитие территорий. Этот подход объединяет элементы геоэкологии, экономики природопользования и землеустройства, позволяя оценить способность территории воспроизводить природные компоненты при одновременном обеспечении хозяйственных нужд.

Keywords: Ecological - economic assessment, anthropogenic pressures, environmental assessment, GIS, natural security of the territory, ecological nets.

Ключевые слова: эколого-хозяйственная оценка, антропогенная нагрузка, экологическая оценка, ГИС, естественная безопасность территории, экологические сети.

Ecological and economic assessment of the territory is defined as a systematized study of the natural, social and economic characteristics of lands with the aim of identifying their potential, vulnerabilities and opportunities for

optimizing the land use structure. For the successful creation of programs and their implementation within the framework of the concept of sustainable development, new approaches are needed aimed at organizing an environmentally compatible society. One of such approaches is the concept of ecological-economic balance (EEB) of the territory, which establishes and maintains harmonious relations between nature and human economic activity [1]. In connection with the climate growth provide concern for economic activity of man and significant activity with change of the maximum natural environment there is an acute need for an integral step in assessing its condition for the degree of favorability for modern man analyzed and other living creatures. Ecological and economic assessment of the territory is aimed at identifying the most favorable land plots for the goals set by the company or production, as well as in case of necessity monitoring the process of restoration of depleted zones.

The concept of the ecological-economic balance of the territory includes the following conditions: organization, arrangement and arrangement of territories of different administrative levels on a landscape-ecological basis; preservation and maintenance of natural and slightly modified landscapes that perform important environmental and resource-forming functions in full; rational use and maintenance of the natural potential of the territory, a reasonable distribution of natural resource rents; governance, self-government and territorial justice; achieving an acceptable quality of life and products and maintaining a healthy lifestyle; development of innovative processes [2].

In the process of studying the existing experience in assessing EEB, it was noted that, depending on the chosen research unit, its physical and geographical features and economic development, the components used for the assessment are different, and the development of geographic information technologies allows you to create cartographic products, which reflects each stage of the assessment, as well as the synthesis of the results.

The origins of land condition assessment can be traced back to classical works on geography and soil science, such as the research of V.V. Dokuchaev,

where it was first proposed to take into account agronomic and ecological characteristics when distributing land resources. Over time, separate directions aimed at assessing the ecological and economic condition of the territory were formed in Soviet and post-Soviet science, which is confirmed by dissertation research, for example, the works of V.A.Lobkovsky (1999) and other specialists in the field of environmental protection and rational land use.

Against the background of the successful application of the EEB assessment, the completion of which is the creation of recommendations on the sustainable development of territories, the problem of uniformity and themes of the used and obtained cartographic material is relevant. Modern cartographic works, the purpose of which is an analysis of the ecological-economic condition and its assessment, are based on the techniques proposed by B.I.Kochurov and V.A.Lobkovsky. Today there are two concepts that overlap with each other and complement this ecological-economic condition (EEC) and the ecological-economic balance (EEB). Methodological approaches to the analysis of the EEC and balance of the territory were developed by B.I.Kochurov, Yu.G.Ivanov, V.A.Lobkovsky, and were first tested on example of the territories of the Moscow region and the Republic of Altai. B.I.Kochurov devoted his work to the concept of EEB [3, 5, 7].

It is also important to note the role of GIS in assessing the environmental and economic balance, as a promising tool that makes it possible to analyze calculated indicators and identify spatial patterns. GIS makes it possible to conduct queries on the values of the coefficients (K_a, K_r, K_{ns}), visualize them for comparison and analysis of dynamics, as well as build thematic cartograms that allow you to identify areas with both favorable and unfavorable nature management structures that need more in-depth research.

The assessment of the EEC of the Ferghana region was based on the National Report of the State Committee on Land Resources, Geodesy, Cartography and State Cadastre of the Republic of Uzbekistan on the state of land resources and the data on land balance of cities and districts of the Ferghana

region. To assess the current geoecological situation caused by the use of natural and natural resources of the Fergana region, the level of environmental and economic stresses of urban and district territories is studied. For this purpose, anthropogenic load (AL) indicator by city and county is analyzed.

The grouping of lands by the degree of anthropogenic load makes it possible to evaluate the anthropogenic transformation of the territory in comparable terms. They are the coefficients of absolute (K_a) and relative (K_o) tension of the EEC of the territory, calculated by the formulas (1)–(2): coefficient of absolute tension of the EEB of the territory (K_a); coefficient of relative strength of the EEB of the territory (K_r); coefficient of natural security of the land fund (K_{ns}); ecological fund of the territory (P_{ef}); the area of the study area (P_t) (table 1).

Table-1

Coefficients evaluate the ecological-economic balance of the territory (B.I.Kochurov, 1999, 2003).

Name of coefficient	Formula	Used data	Change characteristic values
Absolute ecological tension coefficient	$K_a \frac{AL6}{AL1}$	Areas with high and low anthropogenic loads are taken into account	K_a - the higher the coefficient value, the tighter the situation
Relative environmental stress ratio	$K_r \frac{AL4+AL5+AL6}{AL1+AL2+AL3}$	Areas of various types of anthropogenic load are taken into account.	$K_r \leq 1$ - tension of the EES of the territory of the balance is balanced To - the higher the value of the coefficient, the tense the situation
The coefficient of natural security of the territory	$K_{ns} \frac{P_{ef}}{P_t}$	Is used P_{ef}=AL1+0,8AL2 +0,6AL3+0,4AL4 and P_t – the area of the studied territory	K_{ns} – the higher the coefficient value, the better the situation $K_{ns} < 0,5$ – critical level of territory security

The concept of the EEB allows the inclusion of criteria for assessing anthropogenic load in a particular order across specific regions, ie administrative units. Calculation of computers for administrative units of Fergana region is

carried out in several stages. The first phase of the calculation focused on the anthropogenic load for all land categories and types, and the appropriate score.

Taking into account the recreational needs of the urban population and their role in optimizing the ecological situation, special attention should be paid to the establishment of recreational zones, micro reserves and shelter forests in the areas adjacent to the cities. Biodiversity forests between recreational areas and other land users may serve as buffer zone. The ecological importance of such zones is very high and serves as an ecological barrier, which protects the recreation zones from negative anthropogenic effects. Therefore, it is important to distinguish elements that function as environmental barriers in the structure of the ecological nets, especially around settlements and industrial enterprises.

As studies have shown, the ecological-economic condition of the territory of the region is unsatisfactory. In connection with the development of agricultural production, industrialization, urbanization, it continues to deteriorate. Agricultural lands are exposed to erosion, deflation, salinization. The transition to an adaptive landscape farming system should be carried out taking into account the ecological-economic condition of the territory. Planned activities should not lead to an increase in the values of the coefficient of its relative intensity of the EES above 1.0. To recommend to the design organizations when assessing the EES of the territory to use our proposed methodology, taking into account the level of land reclamation arrangement of the territory. To carry out the general anti-erosion organization of small land holdings simultaneously on the entire catchment, regardless of the boundaries of the allotment owners.

Further economic development of the region under study should be oriented toward rational use and preservation of the territory's natural resource potential. This will minimize and prevent the development of negative processes in the interaction of natural and economic systems in the future. The priority task of rational land use is to optimize the structure of lands in favor of the natural components of the agricultural landscape.

Ecological and economic assessment of the territory is a fundamental tool in modern land management. Its development reflects the desire to ensure a balance between economic activity and the preservation of natural capital. Integration of modern technologies and unification of methodological approaches are key factors contributing to the sustainable development of territories and improving the quality of life of the population.

Based on these criteria, indices are developed that allow for a quantitative assessment of the state of the territory. The development of GIS technologies and remote sensing has significantly expanded the possibilities for spatial analysis of the ecological and economic state of territories. These technologies allow not only to collect and process data, but also to visualize the distribution of natural resources, contaminated areas and other key characteristics, which makes the assessment more objective and scalable. In practice, ecological and economic assessment is used in the development of land management schemes, planning of agricultural enterprises and urban infrastructure.

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