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OPPORTUNITIES FOR ECONOMIC USE OF THE LANDSCAPES OF THE NUROTA–QO'YTOSH DEPRESSION

Abstract

This article examines the natural conditions, landscapes, and geoecological state of the Nurota–Qo'ytosh Depression. It analyzes the current economic use of the region's landscapes, the environmental problems arising from such activities, and possible solutions for sustainable development.

Keywords: natural conditions, relief, depression, landscapes, economic activity, natural resources, soil cover, livestock breeding, agriculture, horticulture.

ВОЗМОЖНОСТИ ИСПОЛЬЗОВАНИЯ ЛАНДШАФТОВ НУРОТА-КОЙТАШСКОЙ ВПАДИНЫ В ХОЗЯЙСТВЕННЫХ ЦЕЛЯХ

Аннотация

В данной статье рассматриваются природные условия, ландшафты и геоэкологическое состояние Нурота-Койташской впадины. Анализируются современное хозяйственное использование ландшафтов региона, экологические проблемы, возникающие в результате данной деятельности, а также возможные пути их решения в целях обеспечения устойчивого развития.

Ключевые слова: природные условия, рельеф, впадина, ландшафты, хозяйственная деятельность, природные ресурсы, почвенный покров, животноводство, земледелие, садоводство.

Introduction

The Nurota–Qo‘ytosh Depression is located between the Northern Nurota and Southern Nurota mountain ranges and stretches approximately 150–160 km from southeast to northwest. The study area is bordered by the Northern Nurota and Qo‘ytosh Mountains in the north and northeast; by the Oqtov, Qaraqchitov, and G‘ubdintov ranges, which are parts of the Southern Nurota Mountains, in the south; by the G‘allaorol Depression in the east; and by the Kyzylkum Desert in the west [1; 8–9]. Studies devoted to the landscapes of the Nurota–Qo‘ytosh Depression and its surroundings can be found in the scientific works of L.N. Babushkin and N.A. Kogay [3; 66–67].

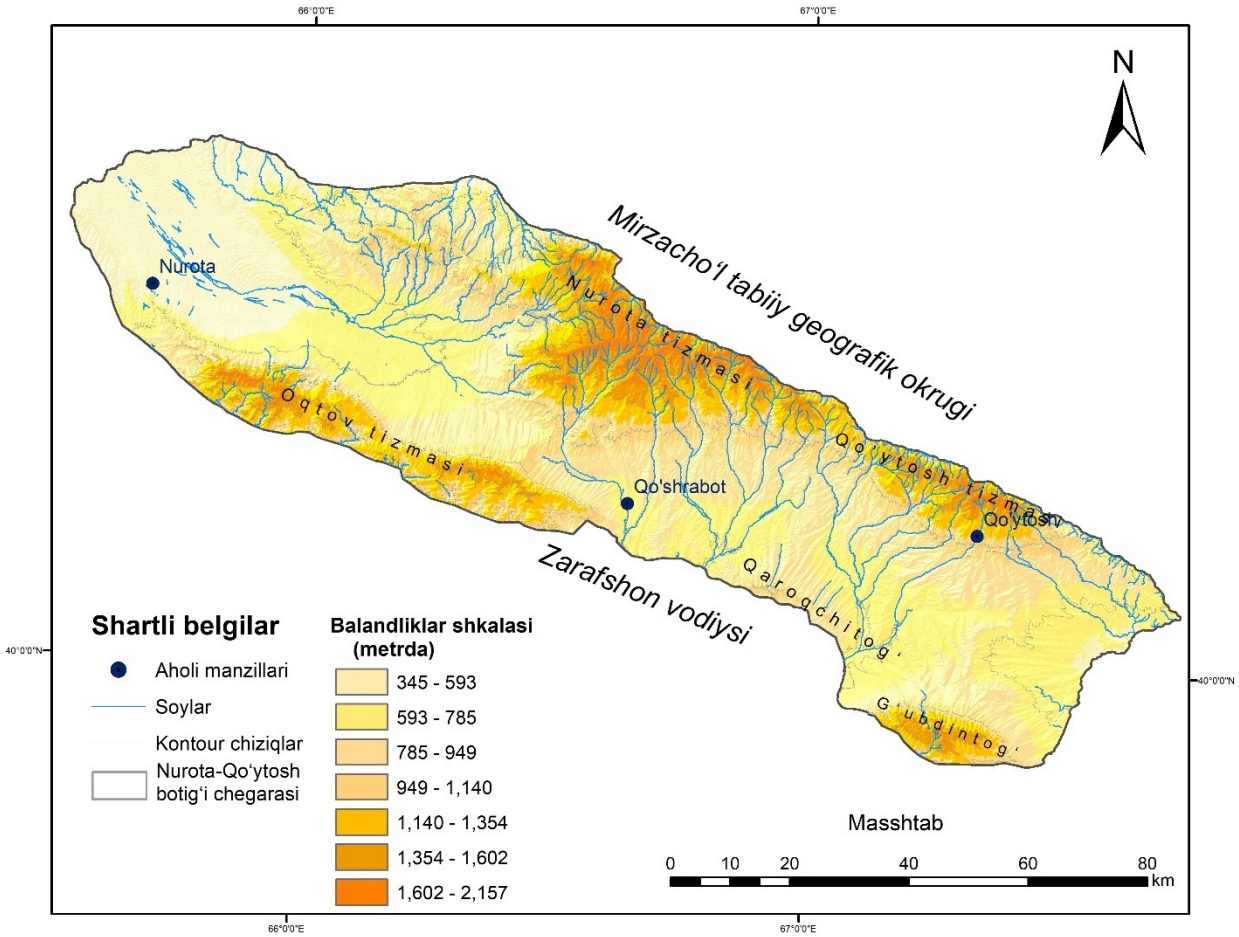

Figure 1. Physical-Geographical Map of the Nurota–Qo‘ytosh Depression

Main Part

The Nurota–Qo‘ytosh Depression is one of the regions of Uzbekistan characterized by a complex physical-geographical structure. The landscape system of this territory has developed as a result of the interaction of components of different origins, making it an important factor in the territorial organization of economic activities. The diversity of natural conditions, particularly landforms, climatic conditions, soil cover, and the uneven distribution of water resources, determines the level of development of economic sectors.

This article provides a comprehensive analysis of the current use of the landscapes of the Nurota–Qo‘ytosh Depression, their economic efficiency, existing problems, and future development prospects. Morphostructurally, the landscapes of the depression are diverse, and each type is specialized in specific economic activities. The region includes foothill plains, depression areas, semi-desert zones, and low mountain slopes. Foothill plains possess relatively fertile soils and are therefore the most suitable areas for agriculture. In the depression zones, the relatively shallow occurrence of groundwater creates favorable conditions for irrigated farming. Semi-desert landscapes are mainly used for livestock grazing, while mountain slopes are ecologically sensitive areas requiring restricted use [1; 132].

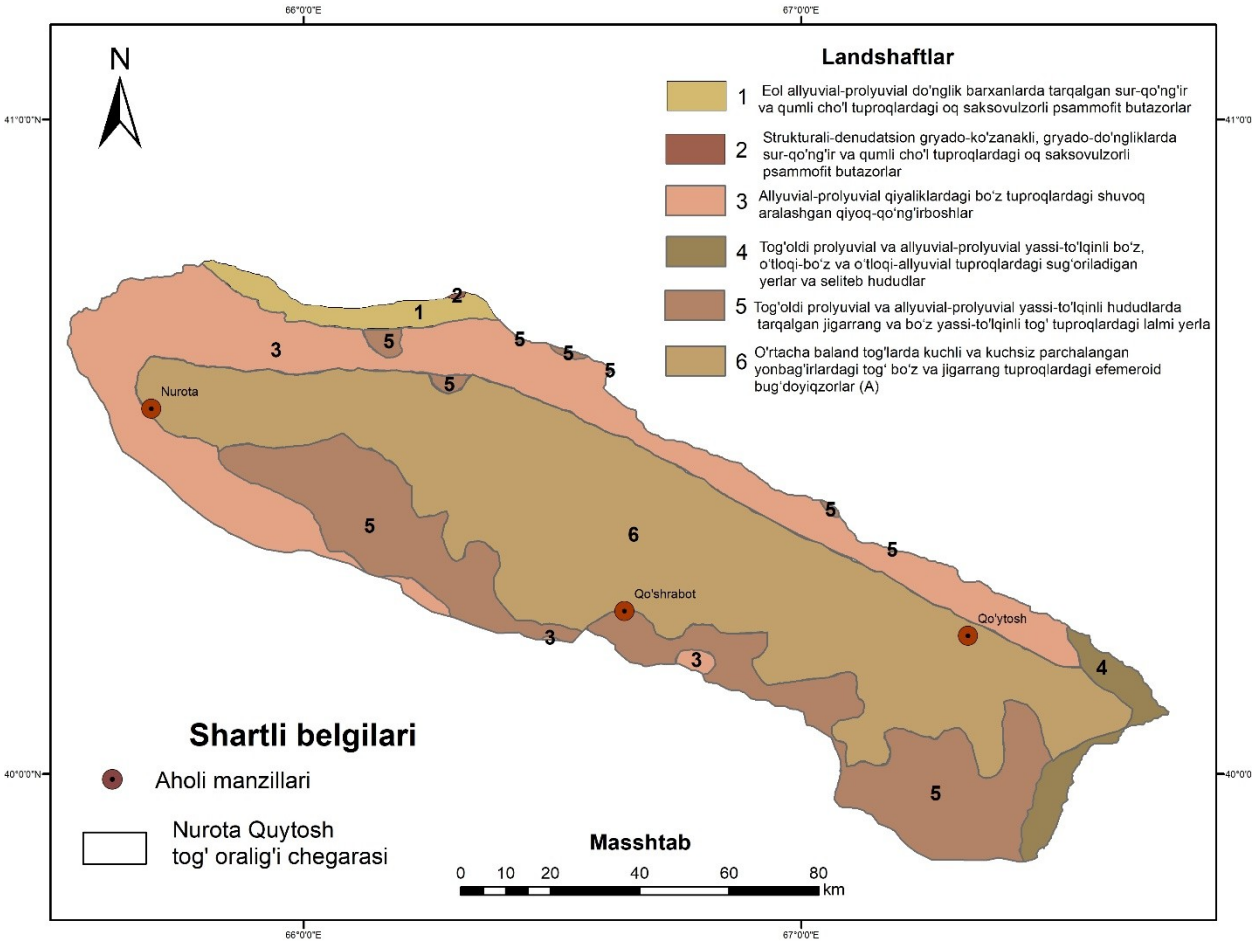

Figure 2. Landscape Map of the Nurota–Qo‘ytosh Depression

In 1964, L.N. Babushkin and N.A. Kogay divided the territory of Uzbekistan into 10 physical-geographical districts, 40 regions, and 66 landscape types. The study area belongs to the Nurota Region of the Turkestan–Nurota District. They identified the following seven landscape types within this territory:

1. Cultural landscapes on loess plains with irrigated typical gray soils;
2. Undulating loess plains with typical gray soils covered by rang and qo‘ng‘irbosh vegetation;
3. Lower mountain slope landscapes with dark gray soils and almond groves;
4. Strongly dissected middle mountain landscapes with brown soils and ephemeral-steppe vegetation;

5. Strongly dissected middle mountain landscapes with brown soils and juniper forests;
6. High mountain meadow landscapes dominated by feather grass and sorrel vegetation;
7. Cultural landscapes in reclaimed territories [6; 56–58].

Table 1. Economic Potential of Landscapes

Landscape Type	Natural Characteristics	Economic Use
Foothillplain landscapes	Fertile soils and favorable climate	Agriculture and horticulture
Depression landscapes	Relatively higher moisture availability	Irrigated farming
Semi-desert landscapes	Arid conditions and sparse vegetation	Pasture livestock farming
Mountainslope landscapes	High erosion risk and complex relief	Limited use; forestry in some areas

Agriculture in the region is mainly based on irrigation, making water resources a decisive factor. Grain and industrial crops are cultivated on irrigated lands. Rain-fed farming is also practiced in some areas; however, its productivity is highly dependent on climatic conditions. Inefficient water use, outdated irrigation systems, and incomplete implementation of agrotechnical measures have led to declining crop yields.

Table 2. Structure of Agricultural Production (Approximate)

Sector	Share (%)	Characteristics
Livestock breeding	50	Dependent on pasture resources
Agriculture	35	Dominant in irrigated areas

Sector	Share (%)	Characteristics
Horticulture	10	Developed in foothill zones
Other activities	5	Local services

Livestock Farming and Pasture Resources

Livestock farming is one of the key sectors of the regional economy and relies primarily on natural pastures. In some areas, pasture use exceeds sustainable limits, leading to vegetation degradation and soil deterioration. Effective pasture management requires seasonal rotation, regulation of livestock numbers, and improvement of pasture infrastructure.

Industrial development in the region remains relatively low and is mainly limited to small-scale manufacturing and processing enterprises. This indicates that existing raw material resources are not fully utilized. Likewise, the service sector remains underdeveloped, contributing to the relatively low level of economic activity in the area.

Problems Related to the Use of Natural Resources

Several challenges affect economic activities in the region, primarily associated with natural and anthropogenic factors. The major problems include:

- Limited water resources;
- Soil salinization;
- Wind and water erosion;
- Pasture degradation.

Prospects for Development

Considering the existing potential of the region, development can be promoted through several directions, particularly the introduction of water-saving technologies and other modern methods aimed at increasing economic efficiency.

The Nurota–Qo‘ytosh Depression is characterized by an arid climate, low precipitation, and limited surface water resources. Since agricultural production largely depends on irrigated farming, the rational use of water resources, improvement of irrigation efficiency, and reduction of water losses are among the most pressing issues.

The introduction of water-saving technologies contributes not only to water conservation but also to increasing agricultural productivity, preventing soil degradation, and ensuring ecological sustainability.

First, the widespread implementation of drip irrigation technology is highly advisable. This method delivers water directly to plant roots and can reduce water consumption by 35–50% compared to traditional furrow irrigation. It also significantly decreases water losses through evaporation and seepage. Drip irrigation is especially effective in horticulture, viticulture, and vegetable production. Furthermore, it enhances fertilizer efficiency through fertigation systems.

Sprinkler irrigation systems may also be effective in certain parts of the region, particularly in uneven terrain and forage crop fields. However, in areas with high wind speeds, modern low-pressure sprinkler systems are recommended to minimize evaporation losses.

The use of digital monitoring systems represents another important direction in water conservation. Soil moisture sensors, meteorological monitoring equipment, and automated management systems make it possible to determine irrigation norms scientifically. This helps prevent excessive irrigation and improves water-use

efficiency. In addition, Geographic Information Systems (GIS) and remote sensing technologies can be used to monitor crop water requirements.

Modernization of irrigation infrastructure is equally important. Significant water losses currently occur in some irrigation canals due to filtration and evaporation. Therefore, converting open canals into concrete-lined channels or pipeline systems would considerably reduce water losses and improve water distribution efficiency.

The implementation of water-saving agrotechnical measures is also essential. For example, mulching technologies help retain soil moisture and reduce evaporation. Conservation tillage improves soil structure and moisture retention capacity. Replacing water-intensive crops with drought-resistant species can also yield positive results under local conditions.

Improving economic mechanisms for water resource management is another important measure. This includes digital water accounting systems, differential water tariffs, and financial support for farmers implementing water-saving technologies through subsidies and preferential loans. Such measures create economic incentives for efficient water use.

Strengthening the activities of water users' associations and organizing regular training seminars for farmers are equally important. The effectiveness of water-saving technologies largely depends on users' knowledge and practical skills. Enhancing environmental awareness among the population can foster a more responsible attitude toward water resources.

The large-scale introduction of water-saving technologies in the Nurota–Qo'ytosh Depression is a key factor in ensuring the sustainability of agricultural production under conditions of water scarcity. Expanding drip and sprinkler irrigation systems, utilizing digital monitoring tools, modernizing irrigation infrastructure, and developing economic incentive mechanisms can significantly increase water-

use efficiency. The comprehensive implementation of these measures will contribute to the ecological and economic sustainability of the region and enhance its future development opportunities.

Conclusion

In conclusion, the rational use of the landscapes of the Nurota–Qo‘ytosh Depression for economic purposes is closely linked to maintaining ecological balance and ensuring effective management of natural resources. Preventing soil erosion, conserving water resources, protecting biodiversity, and introducing environmentally friendly technologies are key factors in achieving these goals. Such measures not only meet the needs of the present generation but also create a favorable and sustainable environment for future generations. Therefore, the protection and rational utilization of natural landscapes should be regarded as a fundamental principle of economic activity.

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