

ISSUES OF ASSESSMENT AND PROTECTION OF THE ECOLOGICAL CONDITION
OF OASIS LANDSCAPES OF KHOREZM REGION

Khayibaev Abror Ismoilovich

Researcher of the "Geography" department of Urganch State University

Abstract. *The article describes the ecological conditions of the anthropogenic oasis landscapes of the Khorezm region, which are considered a part of the Khorezm oasis, including various factors that have a negative effect on the soil cover of irrigated areas occupying the main part of the territory are listed. The reasons for the occurrence of these factors and solutions to complex environmental situations are shown, suggestions and recommendations are given.*

Key words: *Oasis landscapes, seliteb landscapes, soil salinity, secondary salinity, anthropogenic desertification, water erosion, greening, microclimate.*

INTRODUCTION

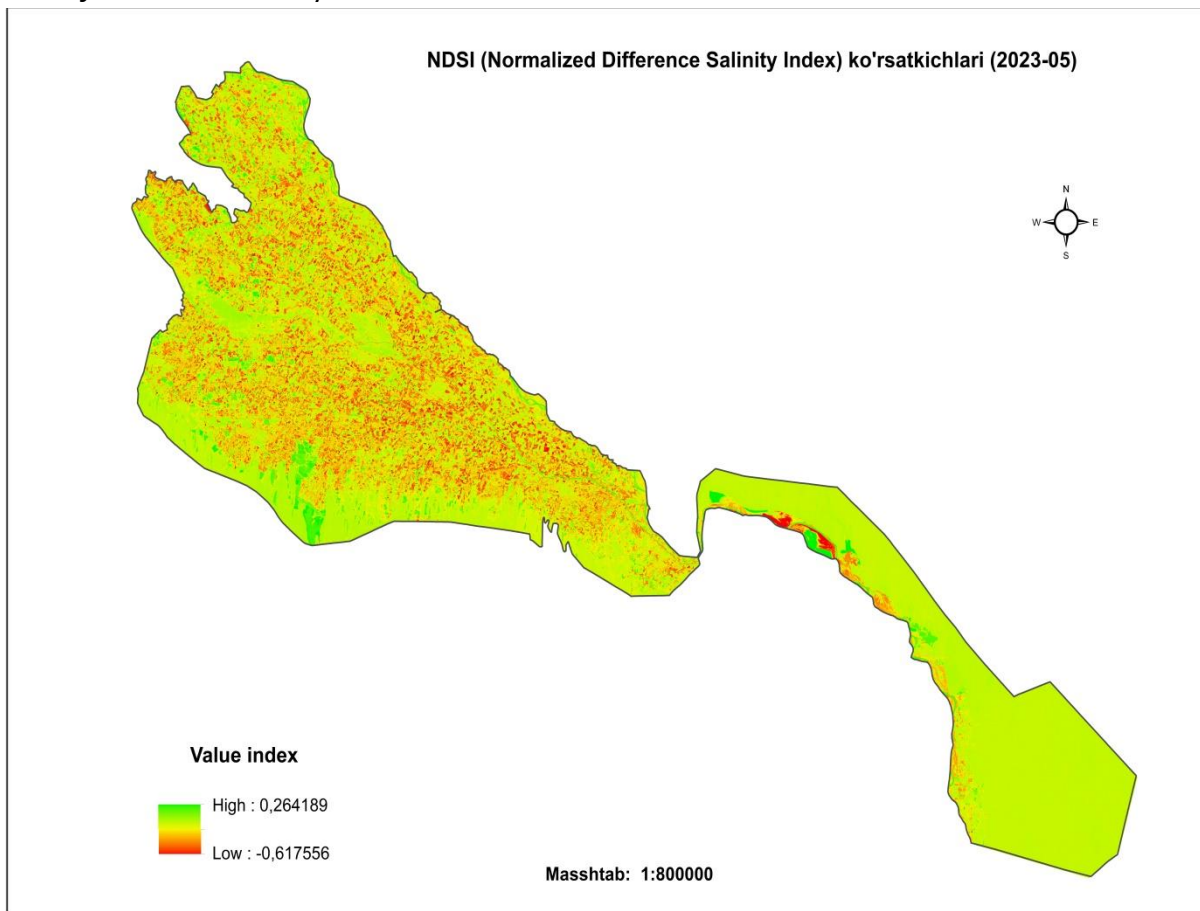
In the current period, the relationship between man and nature, especially the protection of colorful natural and anthropogenic oasis landscape complexes, the surrounding environment, atmospheric air, agrolandscapes, soil types, drinking water, urban and rural landscapes, natural resources appropriate and rational use of them, economical use of wastewater and drinking water is considered one of the biggest urgent problems.

Since the middle of the 20th century, the rapid growth of science and technology, the formation of the geotextile system in the landscape sphere, has turned the problem of optimizing the relationship between man and nature and the geoecological situations that have arisen into an extremely urgent issue..

Main part. Man-made and managed oasis landscapes, including the oasis landscapes of Khorezm region, especially irrigated agro-landscapes, are in dire need of protection.. Because the irrigated soil layer of the agro-landscapes occupying large areas in the Khorezm oasis region has a secondary, i.e., re-salination character. The soil layer of the permanently irrigated fields in this oasis is 85-90% saline, in some regions of the region up to 100%.

In 2018, 50% of irrigated lands are weakly, 33% moderately, 10% strongly saline, and 7% not saline. In the conditions of water scarcity in 2023, the percentage of moderately and strongly saline soils increased (48% and 16%), while weakly saline soils decreased to 48%. The salt composition of the soil is mainly dominated by chloride and sulfate salts, and their distribution is 50-833 t/ha in the upper 2-meter section. The level of salinity has regional differences depending on the type of crops grown and the level and mineralization of underground water. According to the results of the obtained data, it was observed that highly saline soils are widespread in Gurlan and Koshkopir districts, where the absolute height of the surface of the region is 77

meters. The districts of Yangariq, Koshkopir, Shavot and Yangibazar, which are located in the lower regions of the relief, are distinguished by the amount of easily soluble salts in the 0-1 meter layer of the soil. Here, the amount of easily soluble salts in the 0-1 meter layer is 200-300 t/ha.



It can be seen that there is a large share of saline areas in the irrigated lands of the region. The main reasons for this are the size of the irrigated lands, the flatness of the relief, the low slope, the very low rate of outflow of excess water, the proximity of seepage waters, the salinity of the soil under the influence of various factors, and the level of salinity of seepage waters. This, in turn, has a negative impact on the productivity of agricultural crops.

Irrigated agro-soils are salinized to different degrees (weak, medium and strong) and require protection during the salinization process. Therefore, it is advisable to carry out salt washing of saline soils in the irrigated cropland in the winter months consistently and based on agrotechnical rules. In addition, protection of all irrigated agro-landscapes in Khorezm region from water and wind erosion, soil contamination with toxic chemical compounds, oasis landscapes from the invasion of shifting sands is an important task.

The main part of the Khorezm region is composed of seliteb oasis landscapes inhabited by people. Seliteb landscapes are divided into two types according to their nature and content: 1) urban seliteb landscapes and 2) rural seliteb landscapes. In the area of the urban landscape, not a trace of the natural landscape remains, as it has

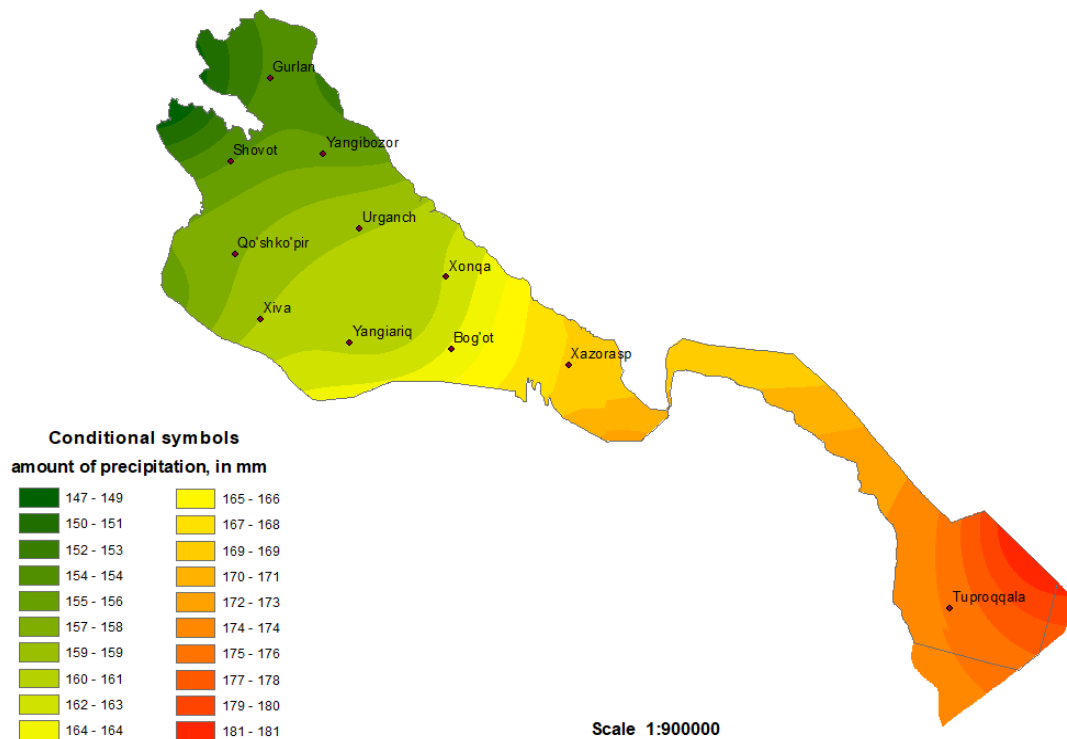
been heavily altered. In the urban landscape, under the influence of technological civilization, an urban landscape that is fundamentally different from the natural landscape has emerged [1].

One of the urgent tasks related to the worsening of the ecological situation is the preservation of the nature of urban and rural landscapes and its atmospheric air in an optimal condition for human life and health. In particular, the impact of motor vehicles on the air pollution of urban landscapes is significant. Various toxic gases emitted from cars, waste from industrial enterprises and household service enterprises spoil the city air and have a negative effect on human health. Therefore, greening of settlements, cities, planting flowers, planting evergreen trees, increasing the number of green zones and recreation areas around the city will allow to optimize the environmental conditions in urban and rural landscapes. Large-scale organization of green areas in cities prevents heat, preserves air humidity, creates a microclimate, and thus creates optimal conditions for people. This is also a form of protection of oasis landscapes.

Global climate changes, i.e. the rising air temperature, are leading to the worsening of the ecological situation in the Aral Bay, Kyzylkum, including the Khorezm oasis. The reason for this can be explained by the location of these regions in the desert zone and their strong tendency to the process of desertification. Especially in these regions, the problem of water shortage is the most visible process, the living conditions, agriculture and household life of the inhabitants of these regions are strongly affected. As a result of climate change, the amount of water resources and the process of their formation changes from year to year.

The impact of climate change on the irrigated areas and the soil layer is clearly felt in the Khorezm oasis, where the land is degraded and desertification is expanding. In addition, the processes of anthropogenic desertification in the process of cutting down many trees, water pollution, and the development of natural landscapes for agricultural, industrial and other purposes will further increase the scale of the problem of climate warming. Climate change in the oasis increases the presence of high temperatures and strong winds in summer, carries dust storms poisoned with chemicals harmful to human health, accelerates the evaporation of water from the soil surface, and negatively affects the development and productivity of agricultural crops.

The latest hydrometeorological indicators show that the maximum increase in summer temperature in this area has increased from 43°C to 53°C, while in winter it has decreased from -27°C to -32°C [1]. The average annual temperature in the Khorezm oasis is 14.5°C, the average annual rainfall is around 80 mm. Previously, during the period when the Aral Sea was full, constant evaporation was observed in this basin, and the humidity was somewhat high there, that is, a favorable regional microclimate was created in the area, which had a positive effect on the climate and nature of the Khorezm oasis.



In order to mitigate the negative impact of climate change on Khorezm oasis, first of all greening of the area, i.e. planting trees, including the correct distribution of Amudarya water, the correct use of industrial enterprises, it is necessary to apply a number of measures one by one.

Soil cover is an indicator of the condition of irrigated lands in oases, and based on the results of soil evaluation, a general conclusion can be made about the condition of agroecosystems. In oases, the water-salt regime of the soil is the main factor that determines the state of land reclamation.

The natural water permeability of the soil determines the general state of the melioration conditions in the oases, salt accumulation and salinity, floods, swamping and the depth of the groundwater level, types of drainage and their technical aspects [5].

Important natural factors determining the reclamation status of irrigated lands in the delta plains. Assessment of the natural and amelioration conditions of the territories, which includes the engineering and technical conditions of the construction of hydrotechnical structures, land preparation for use, the amelioration procedure (mode) of irrigation, the placement of agricultural crops depending on the level of moisture and climatic resources, the use of irrigated lands is based on the analysis and synthesis of natural factors that determine unfavorable natural processes that can develop during.

The main scientific principle of natural-ameliorative assessment to increase the productivity of irrigated lands in oases is the landscape (or landscape-ameliorative) principle, which reflects all the anatomical aspects of the place. Geomorphological, landscape-cartographic, aerospace, landscape-indication, landscape-geochemical and other methods are usually used to assess the natural and meliorative conditions of

irrigated lands in oases. Because they are based on direct field conditions research, as well as analysis of soil, ground and water samples. The aerospace method is effective in researching the reclamation conditions of irrigated lands.

The relief (type of deltas) determines the general nature of land reclamation, the water permeability of the area, the design and operation of hydrotechnical structures, the ways of efficient use of irrigated lands and pastures. The topography of the irrigated regions of the deltas determines, among other factors, the order of groundwater in the corresponding order of occurrence and the nature of the salinity of the soil, as well as the ameliorative order of irrigation (semi-hydromorphic, hydromorphic). The lithological composition of the delta deposits is primarily determined by the natural water permeability of the area, the water regime of the soil, the state of land reclamation, the possibilities of building hydrotechnical structures, the character of the development of natural-geographical processes and phenomena. Soils are the basis of all reclamation and hydrotechnical structures and serve as the main factor in managing complex irrigation-reclamation processes [4].

Ground waters and their order determine the direction of soil-ameliorative condition in oases. The depth, mineralization, chemical composition and movement speed of groundwater are the main factors of the water-salt system of the soil.

Surface water has an indirect effect on land reclamation in oases, that is, through groundwater. Surface water - irrigation canals, water reservoirs, river systems of deltas - is a local source of groundwater saturation and is one of the important factors in the mixing and dissolution of salts and their storage in the soil. As V.A.Kovda (1981) noted, surface water is a source of salts accumulated in the soil during irrigation, and the degree of pollution of irrigation water determines the salinity of the irrigated land.

The distribution of natural processes and phenomena of meliorational importance is directly related to the state of land reclamation, halogeochemical processes, the state of engineering - melioration and irrigation hydrostructures and the nature of their operation, the possibility of planting one or another crop, they obey certain laws in oases and have a regional character.

In addition to the above recommendations, we can put forward the following recommendations: 1) in the conditions of climate change, bringing the microclimate of crops to an acceptable state, managing the microclimate in general; 2) slowing down the process of desertification through the widespread use of water-saving methods; 3) take measures to drastically slow down the rate of soil salinization; 4) organization of forestry in degraded lands using local trees; 5) purposeful use of natural cold.

Of course, the methods of putting the above recommendations into practice have been developed, and today they are of great importance in protecting against the negative consequences of climate change, and in addition, in the correct approach to the sustainable development of agriculture.

Conclusion. In short, overcoming the complex physical, economic, and socio-political consequences of climate change is defined as how the future of humanity will

continue. Therefore, it is one of our urgent tasks to eliminate this urgent and pending problem by making local, regional, and international decisions based on the above suggestions and recommendations. Including the preservation of the system of natural water bodies in the Khorezm oasis, preservation of biological diversity, restoration of biological resources, preservation of animal and plant life, creation of small areas with a favorable microclimate (wetlands) due to the creation of artificial lakes, cotton and rice cultivation areas that require the most water it is possible to solve this problem by drastically reducing it and maintain a favorable climate for human life in the oasis.

Science and technology development opens wide opportunities to meet the material and spiritual needs of the society in every way, but on the other hand, it requires more and more intensive use of natural resources. This process has a negative impact on the surrounding environment and ecological balance. Therefore, at the current stage of the development of our republic, it is the sacred duty of each of us to take care of the rational use of natural resources, forests, clean air, wildlife, land and water, and the production of ecologically clean products.

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