

MONITORING OF AGRICULTURAL ARABLE LAND THROUGH MODERN ELECTRONIC PROGRAMS AND THE EXAMPLE OF SURKHANDARYA REGION

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Abstract. *This article presents the work on monitoring and analyzing agricultural arable land in the Republic of Uzbekistan over the past five years using modern electronic programs, developing monitoring, assessment and reporting forms for measures to combat land degradation, and other information in the field of rapid data processing.*

Keywords: *Land, modern programs, GIS, agricultural arable land, monitoring degraded lands, innovative sectors, cross-section of territories, population, digital technologies and statistical data.*

In the current era of climate change, modern electronic programs play a significant role in monitoring and analyzing agricultural land in Uzbekistan, transforming degraded lands into thriving ecosystems and sustainable areas. In recent years, as a result of global climate change, dust storms have become more frequent in our country, which is also due to global climate change, illegal logging, water scarcity, and uncontrolled livestock grazing, which are leading to the degradation of desert pastures.

In this regard, the country is committed to aligning its strategies with the UN Convention to Combat Desertification on Land Degradation Neutrality and ensuring sustainable livelihoods for vulnerable populations. In this context, restoring degraded lands and increasing drought resilience requires significant financial resources. Such efforts often exceed the budget of the republic. Robust mechanisms to facilitate access to international financing and innovative partnerships are essential for the success of collective efforts. The following proposals were recognized for this purpose:

- ✚ Simplify the application and approval processes for access to funds;
- ✚ Increase grant financing for projects with limited financial returns that deliver long-term environmental benefits;
- ✚ Provide technical assistance to develop bankable projects that meet donor requirements;
- ✚ Innovative financing mechanisms and instruments, including expanding green bonds, have been proposed to mobilize additional resources.

Our republic has invested in advanced irrigation systems, reducing water use in agriculture and increasing drought tolerance. In developed countries, scientific research is being conducted by scientists to monitor and analyze agricultural land.

Figure 1. Monitoring work through modern electronic programs.



In this regard, the Cabinet of Ministers has decided to implement the Resolution of the President of the Republic of Uzbekistan No. PP-277 dated June 10, 2022 "On measures to create an effective system for combating land degradation", as well as to combat land degradation and mitigate its negative consequences, prevent drought and desertification in the regions, preserve and increase soil fertility, restore degraded lands, and widely use advanced scientific developments and innovations in this area.

It is intended to establish the procedure for monitoring, evaluating and reporting forms for measures to combat land degradation and prevent land degradation processes and soil protection, and to publish the results.

The Regulation on the procedure for monitoring, evaluating and reporting forms for measures to combat land degradation and to publish their results was also approved.

✚ Procedure for organizing monitoring of measures to combat land degradation and receiving reports;

✚ Procedure for publishing the results of measures to combat land degradation.

Monitoring and analysis of agricultural cropland through a modern electronic program, mitigating the negative consequences of land degradation, global climate change, drought and desertification, maintaining, increasing and restoring soil fertility in agricultural lands, and determining the procedure for implementing monitoring work and implementing measures to combat degradation. The main term of our scientific research, Monitoring and analysis of agricultural cropland through a modern electronic program, land degradation is explained by the Global Environmental Fund as follows, and its most important indicators are the following 3 factors.

- Decline in productivity Decline in land productivity is observed in all regions of Uzbekistan. Soil fertility is usually calculated in terms of bonitet scores, with a unit of 0 to 100 points.

How the bonitet score is calculated is not important for everyone, but it is important to know that the higher the bonitet score, the more fertile the land. Since the early 1990s, the bonitet score of irrigated lands in Uzbekistan has decreased by an average of 10 points from 55–65 points.

- The decline in natural biodiversity is directly related to the existing diversity of biological life forms participating in all processes that provide certain ecological services (productivity, pollution tolerance, hydrology, participation in the cycle of chemical substances, etc.). With a decrease in the number of biological species, the quantity and quality of the processes occurring decrease. As a result, degraded lands appear.

- The decrease in the ability to withstand external influences is a constant resistance to various natural (climate and other natural disasters) and anthropogenic (pollution, temporary negative impacts, etc.) impacts. It is precisely the processes in the correct movement within the system, the presence of biodiversity, that lead to the ecosystem's recovery from negative impacts and the restoration of its previous functions.

The main causes of land degradation are unwise agricultural practices, overexploitation of pastures, and the destruction of forests and other vegetation. Unwise agriculture is manifested in the excessive use of water in irrigated lands, the erosion of topsoil by wind and water, the compaction of topsoil, the formation of a special layer, salinization, and the unsuitability of various soil uses.

At the same time, many natural pastures are not used and are subject to degradation. If ungulates do not visit pastures, the top layer of soil hardens and plant seeds characteristic of this area do not spread, and plant biodiversity does not develop, and as mentioned earlier, as biological species decrease, the course of biological processes also worsens, resulting in land degradation.

Degradation of agricultural arable land is one of the most pressing environmental problems in Uzbekistan, affecting various aspects of agriculture and the ecological state of the country. The degradation process includes such phenomena as soil erosion, salinization, depletion of soil resources and reduced productivity. The problem of land degradation is becoming increasingly important in the context of a changing climate and intensive use of land for agricultural needs.

The main causes of land degradation in Uzbekistan, such as improper use of water resources, intensive irrigation, and insufficient agrotechnical training, have been studied. The impact of degradation on the country's ecosystems and economy has been analyzed, and the main goals are to improve agricultural practices, introduce sustainable agricultural practices, and effectively manage water resources. Our country, with its vast agricultural lands and rich natural resources, is facing one of the most pressing problems in today's economic conditions - land degradation.

According to ongoing research and estimates, about 60 percent of Uzbekistan's territory is subject to various forms of land degradation. This percentage is high and continues to grow due to insufficient attention to sustainable land use and inefficient use of agro-ecological resources. The problem of land degradation in our republic also requires comprehensive information about its distribution in different regions of the country, including areas with a high level of degradation. To achieve this goal, we will identify the characteristics of soil degradation.

The problem of degradation of agricultural land resources poses a serious threat to the sustainable development of the country.

This problem is being addressed by reviewing the country's total area and long-term trends in soil quality. At the same time, efforts are being made to improve land use, combat soil degradation, and improve agricultural and water management practices in agriculture. In addition, work is being carried out to implement projects to restore degraded lands and increase their productivity.

The scale of the land degradation problem in Uzbekistan requires urgent and effective measures to prevent further deterioration of the situation and restore the state of the country's soil.

When analyzing the problem of land degradation in Uzbekistan, it is necessary to take into account its distribution in different regions of the country, since each region has its own characteristics and factors affecting soil degradation.

Stresses the need to take into account local characteristics and problems when developing a strategy for sustainable land management in Uzbekistan. Solving the problem of soil degradation requires an integrated approach that takes into account the specific conditions of each region and appropriate measures to prevent further deterioration of the land and restore its productivity.

To sum up, monitoring and analysis of agricultural cropland through modern electronic programs, in achieving success in the fight against degradation, is important at various levels, including state agencies, public organizations, and science. Only through the solution of these problems, efforts can we ensure sustainable management of land resources and preserve ecological integrity for future generations.

In general, the monitoring and analysis of agricultural land through modern electronic programs, solving the problem of land degradation requires a complex and systematic approach, as well as continuous monitoring and analysis in accordance with the changing situation.

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