

The Importance of Monitoring and Controlling Saline Soils in the Republic of Uzbekistan

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Abstract.

In the global aspect, problems associated with irrigation and land reclamation are being studied globally, especially in regions with arid and semiarid zones. Agriculture is based on irrigated agriculture in the arid and semi-arid regions (Uzbekistan, Central Asian countries). There are many problems such as poor soil conditions and land quality, salinization and pollution of irrigated soils, groundwater and water sources. All these problems negatively affect the ecological environment, and one of the reasons for their appearance is the improper water management of irrigation systems. Soil salinization is considered from two sides, the first as a process that appeared for natural reasons and conditions. The second one is the intervention of people in the irrigation process. The highest salinity occurs when people intervene in the ecosystem. The biggest problem in Central Asia is the Aral Sea disaster, the depletion of its water resources. The consequences of this disaster were salinization in irrigated agriculture. This problem is common in Central Asia for over 8 thousand years.

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INTRODUCTION

Earth is the main nurse. Agriculture does not make sense without irrigated agriculture. The main problem of agriculture is an imperfect water management system at different functional levels of the system, which in turn creates problems such as deterioration of soil fertility and quality of agricultural land, and leads to salinization and pollution of soils, groundwater and other water sources.

About ten percent of the surface of the globe is covered with saline lands. Common areas are arid areas. The problem of salinization is present in about 75 countries of the world; these are Australia, China, India, Pakistan, the USA and many others. In the Republic of Uzbekistan, saline land accounts for approximately 46 percent of the total irrigated land.

Salinization of soils leads to a decrease in yield, yield losses are from 0 to 33 percent for weak salinization, about 50 percent for average salinization, 65 to 84 percent for strong salinization, and absolute crop losses for very strong salinization.

The food sector also suffers, soil degradation is the cause of hunger and malnutrition, leads to a suspended state of food prices, people migrate because of this reason, and many become bankrupt.

It is worth noting that the destruction of plant productivity is gradual. The activity of nucleic acids changes, nitrogen metabolism is disrupted, proteins break down, their synthesis is suppressed, this is all due to a violation of synthetic processes and hormonal balance of the roots.

There are 10 main threats to the normal functioning of the soil is erosion, loss of productivity and stocks of carbon in the soil, loss of biodiversity, nutritional imbalance, acidification, pollution, soil salinization and soil compaction. In Uzbekistan, the main reason is the rise in the level of mineralized groundwater above a critical depth due to large losses of water from irrigation systems and increased irrigation rates applied to irrigated fields.

Saline soils are a serious problem that requires a specific approach, systems of activities that include agro-technical complex, manual irrigation system according to the norms of the system of special ameliorative measures that allow the removal of salt from the soil.

METHODS

The methodology for studying the problems of salinization of the land is based on the comparative geographical, analytical methods and the method of generalizing the results.

THE RESULTS OF THE STUDY

The main component of the process of controlling salinization of land is monitoring. It, in turn, will be able to ensure timely receipt of information on the state of agricultural land of the Republic of Uzbekistan. All information received is useful for land users and society. Unified state monitoring is a hierarchy of levels, which allows you to monitor the condition of soils, manage the sources of the problem.

In monitoring soil and water salinization in the Republic of Uzbekistan, such organizations are involved as:

- State Committee for Land Resources, Geodesy, cartographer and state cadastre
- Ministry of Agriculture
- Ministry of Water Resources
- State Committee for Architecture and Construction
- Center of Hydro-meteorological Service under the Cabinet of Ministers
- State Committee of the Republic of Uzbekistan on Geology and Mineral Resources

Regional hydrogeological and reclamation expeditions, created on behalf of the Ministry of Water Management and the Ministry of Agriculture, have been appointed responsible for monitoring irrigated land. The supporting materials are materials of soil research of design institutes, and other scientific organizations and institutes.

The monitoring should be based on principles such as comprehensiveness, a system of observations, approval of dates with geomorphological and hydrological conditions, and calculation of indicators using common methods throughout the Republic of Uzbekistan.

Monitoring is carried out in accordance with the "Land Monitoring Methodology in the Republic of Uzbekistan" developed in 2001. All land in the Republic is monitored, regardless of anything.

When choosing key objects for soil monitoring, attention is paid to their location with typical natural agricultural landscapes in all soil and climatic zones. When interested soils are selected, soil maps with scales of 1: 10000 and 1: 25000 are used. The monitoring period and the scope of work are generally carried out in three periods, preparation, field and chamber.

The salinity of the soil salinity is manifested immediately after any external and internal influences, when tracking the level of salinity, you can get all the information about the processes in the soil.

As a result, it can be noted that monitoring the saline of irrigated soils can solve the following problems:

1. Allows you to calculate the number of saline soils and reclamation systems
2. When taking into account the sources of salts and the state of reclamation systems, it allows you to consider the dynamics of soil salinization at the micro and macro levels
3. Create statistics using data for a certain period, which allows you to make changes to the process of reducing salinity.

It is important to take the data as a basis for more than 5 years, and probably 10 years, to identify objective causes of soil sanding. The data should include images taken from space, high quality and modern computer programs. Using the pictures, you can see the areas with salted and unsalted soils, and the degree of their salinization.

An improved system for continuous monitoring of changes in salinization of irrigated soils should be created. Do not forget about the fight against salinization.

The introduction of effective methods to combat salinity is the main task for irrigated farming. Using the right methods, you can significantly reduce the area of salted soils. Thus, in the Concept of Water Development of the Republic of Uzbekistan for 2020-2030, it is planned to reduce the area with salted soils from 1935 thousand hectares to 1722 thousand hectares.

DISCUSSION

In addition to improving monitoring of saline soil areas, which allows you to control and prevent the emergence of new territories with this nature, great attention should be paid to restoring the properties of irrigated soils.

There are places where soils are highly saline; in such areas, you can use the flushing method. Flushing is the removal of salts from the arable and subsurface horizons of the soil by flushing water, flushing is today one of the main means of combating salinization of irrigated lands.

The beginning of water washing works consists of leveling, processing and breaking by rollers into sections at intervals of 0.2-0.3 hectares, then the sections are filled with water. The norm of the poured water is regulated depending on the degree of salinity, salt composition, water permeability, and the level of groundwater. Typically, washing is carried out in conditions where the evaporation is the smallest and groundwater is low, usually such conditions occur in late autumn. The rest of the wash water is diverted through desalination drainage. The physical properties of the soil and the degree of salinity affect the effectiveness of flushing.

There is already a definite proven system for restoring the properties of irrigated soils. It is advisable to use it together with high-quality monitoring of saline lands. The first step is the use of drainage systems, thereby forming an artificial flow and lowering the level of groundwater. Then, using large-scale technology, compact the plowed plot, the third step, rely on the conditions of soil formation and divide the irrigation rate by two three times, then fertilize and sow crops with salt tolerance properties, for example, sunflower, Sudan grass, Indian sorghum and others. The next stage is to change salt-resistant cultures to alfalfa and shepherd's spherophysis, and only then to plant the culture chosen at the beginning.

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