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## SOIL EROSION. PROBLEMS OF SOIL PREVENTION FROM EROSION

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### ABSTRACT

The article describes soil erosion and the need to implement agro-complex measures to prevent soil erosion and prevent soil erosion in the territory of Uzbekistan. In this regard, it is an important task of agricultural experts to maintain and regularly increase soil fertility. It is not for nothing that the state allocates large amounts of money to the improvement of land reclamation, restoration of soil fertility, construction of reclamation systems, and activities related to their use.

### KEYWORDS

Soil, soil cover, fertility, erosion, humus, nutrient elements, micro-macro elements, chemical composition, physical properties, irrigation, microorganism, terracing, dehumidification, leaching, pasture erosion.

### INTRODUCTION

Agriculture is one of the main sectors of the national economy because agriculture provides food for the population, raw materials for industry, and fodder for livestock. Therefore, it is impossible to develop other sectors of the national economy without comprehensive development of agriculture.

Therefore, in the first years after gaining independence, our republic carried out work on deepening reforms in agriculture.

In recent years, the decision of the Cabinet of Ministers of the Republic of Uzbekistan No. 343 of 03.06.2021 “On further improvement of the system for assessing

the level of environmental pollution” was relevant when talking about the work on the development of agriculture in our country. This decision serves to develop every branch of agriculture in our republic. In particular, in the road map presented in Annex 1 of the Decision, conducting monitoring in the areas where soil pollution sources are located, timely identification of soil pollution factors in the areas where economic entities that affect the environment are located.

Soil fertility is of great importance in the development of agriculture. At the same time, there is a high probability of serious damage to productivity due to soil erosion. Therefore, it is appropriate to stop and talk about soil erosion and ways to eliminate it.

Soil erosion is the most common type of degradation. It causes enormous economic and environmental damage, as it can lead to the loss of soil as the main means of agriculture and as an irreplaceable component of the biosphere. The soil layer is being eroded under the influence of various improperly organized human activities. Erosion is a very common and devastating consequence of soil erosion.

As a result of erosion processes, the organic part of the soil is washed away together with small particles, the thickness of the humus layer decreases, and accordingly the number of humus decreases. In heavily washed soils, carbonate concretions protrude to the soil surface. If the soil profile is stony, then the stones protrude to the surface of the soil. All this worsens the agronomic properties of the soil.

## LITERATURE ANALYSIS

Soil erosion is one of the most complex problems in Uzbekistan's agriculture, and several mature scientists have conducted their scientific research on its spread, causes, types, and methods of elimination. In

particular, V.B. Hussak, M.A. Pankov, Z.N. Antoshina, F.K. Kocherga, M.B. Doshanov, R.G. Murodova, K. Mirzajonov, H.M. Makhmudov, L.A. Gafurova, A.A. Khannazarov, Sh.Nurmatov, S.N.Suchkov, N.F.Matyunin, H.Khamdamov, S.M. Elyuboev, A.Nigmatov, B.Joraev, K.Usmanov, M.Khamidov, S.Meyliboev, O.Haqberdiev, V.N.Li, B.Ahmedov, many other scientists have thoroughly studied the process of erosion in all regions of our republic and developed the scientific basis for eliminating this process.

The methodological basis of the research: Decision of the President of the Republic of Uzbekistan No. PQ-321 dated 14.07.2022 “On measures to introduce advanced technologies to the agriculture of Uzbekistan at the expense of the grant funds of the Government of the Republic of Korea” [1], 343 of the Cabinet of Ministers of the Republic of Uzbekistan dated 03.06.2021 Resolution No. “On further improvement of the environmental pollution assessment system” [2], Resolution No. 527 of the Cabinet of Ministers of the Republic of Uzbekistan dated 27.09.2022 “On measures for the establishment of educational and experimental farms in the field of agriculture” [3] ], Resolution No. 510 of the Cabinet of Ministers of the Republic of Uzbekistan dated 18.06.2019 “Improving the system of agrochemical analysis of soil in agriculture, The Resolution of the President of the Republic of Uzbekistan on January 28, 2022 “On the Development Strategy of New Uzbekistan for 2022-2026”.

## RESEARCH METHODOLOGY

In this work, measures and methods of soil erosion and protection of soil from soil erosion were studied. A systematic approach and analytical methods were used during the research.



As a theoretical and methodological basis of this article, literature and scientific articles on measures to protect soil from erosion to increase land productivity, research conducted by ecologists, soil scientists, agronomists on this topic, analysis of written and oral opinions of scientists and representatives of the field, and monitoring of processes are carried out. increased.

### ANALYSIS AND DISCUSSION OF RESULTS

The development of solutions to problems related to the consistent acceleration of agricultural production, rational use of the land fund, the productivity of each irrigated hectare, and its economic efficiency is of great importance. The land intensively used in agriculture in Uzbekistan is mainly irrigated land, equal to 4.28 million hectares. These lands are truly the Golden Fund of our Republic, and more than 95% of gross agricultural products are grown on them.

In this regard, it is an important task of agricultural experts to maintain and regularly increase soil fertility. It is not for nothing that the state allocates large amounts of money to the improvement of land reclamation, restoration of soil fertility, construction of reclamation systems, and activities related to their use.

Unfortunately, today the soil layer is eroding, good fertile lands are decreasing, and they are rapidly deteriorating. Throughout history, nearly a billion hectares of land have been lost to humans (cities, settlements, buildings, roads, erosion, salt water, etc.). Currently, crops are planted on 1.5 billion hectares of land all over the planet. According to the received data, about 6-7 million hectares of land are being lost every year in the world as mentioned above [6].

If we take into account that two-thirds of the earth's population lives in conditions of poverty and hunger, and if we consider that the arable land per inhabitant

of our planet is less than 10-20 years ago, increasing soil fertility, doubling and tripling the yield of crops in the nearest future it should remain the main task. Several laws and their drafts have been developed to ensure legal reforms in the agrarian sector of our country.

Among them, the Land Code, Laws on Land Cadastre, and other laws of the Republic of Uzbekistan aimed at the development and regulation of land relations based on the law, rational use, and protection of land were adopted and approved by the Oliy Majlis.

Under the influence of various improperly organized human activities, the soil layer is eroded and polluted [9]. The problem of protecting the soil from erosion is an urgent problem for many countries located in the arid climate region of the world, including the territory of Uzbekistan. Because the eroded land area in the republic is about 2 million hectares or more than 40% of the total arable land area [8]. According to our information, there are more than 3 million hectares of dry land suitable for use in the territory of Uzbekistan, of which about 1 million hectares account for the contribution of underserved and semi-served dry land, more than 70 percent of this dry land is subject to surface water erosion.

The classification of eroded soils in Uzbekistan has been developed and a map of the lands at risk of erosion in the republic has been drawn up. Under the influence of the erosion process, slightly eroded, moderately eroded, and strongly eroded, soil and sediment, that is, washed-out soils, are formed, which are the thickness of the soil layer, humus, stock, and composition of nutrient elements (micro and macro elements), the number of microorganisms and quality, chemical and physical properties, bioenergetic indicators indicate that productivity levels are different. It is known that 100-150 tons per hectare and more, and even up to 500 tons per hectare can be

washed away by irrigation erosion. Together with this soil, 500-800 kg of humus, 100-120 kg of nitrogen, and 75-100 kg of phosphorus can be lost per hectare per year [7]. strongly eroded, soil and sediment, that is, washed-out soils are formed, which are due to changes in the thickness of the soil layer, humus, supply and composition of nutrients (micro and macro elements), quantity and quality of microorganisms, chemical and physical properties, bioenergetic indicators indicate that the levels are different. It is known that 100-150 tons per hectare and more, and even up to 500 tons per hectare can be washed away by irrigation erosion.

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It should be noted that erosion processes hurt the soil ecosystem, negatively affecting the amount of solar energy used in biomass and reducing it [10]. As a result of erosion processes, 30 - 50 percent or more of the solar energy absorbed in phytomass, humus, and soil microorganisms is lost, taking into account that the intensity of biological and soil processes occurring in the soil is mainly related to the reserves of solar energy and changes in the reflected light, the scale of damage caused by erosion to the ecosystem can be imagined.

## CONCLUSIONS



In our country, every year, preventing and fighting against soil erosion, and increasing the productivity of soil eroded by water and wind is recognized as an event of state importance. Laws have been passed to protect soil from water and wind erosion. The law defines organizational, agrotechnical, forest melioration, hydro-technical, and other measures to protect the soil from water and wind erosion.

To protect the soil from erosion, it is necessary to carry out agro-complex measures:

- \* during farming in mountainous regions, level the land in the form of terraces (Supachai), to plant fruit trees and vineyards around the fields;
- \* proper organization of plowing and irrigation of steeply sloped lands;
- \* planting trees on the edge of the ravines, preventing the expansion of erosion of the ravines, preventing the flow of water from the irrigated fields into the ravines, and building various barriers and water catchment basins;
- \* To combat wind erosion, the planting of shrub trees, saxes on sandy soils, and the establishment of hedgerows are considered to be the most basic and necessary measures.

Also, planting various blades of grass, using pastures correctly, creating various fences, and also creating a thin sand layer using chemical substances with adhesive properties (oil waste, erosion, polymer K-4, LATEX SKS-65);

- \* To prevent irrigation erosion, taking into account the physical and chemical properties of the soil and the slope of the land, using the experience of advanced irrigators, it is extremely important to plan the amount of water to be poured into the wells for proper

irrigation of crops and to freeze and drain water on lands prone to erosion.

To prevent compaction of the subsoil layer of the irrigated soils, it is necessary to widely introduce the technology of planting and minimum tillage. According to the experiments, the density of the soil per cubic centimeter is equal to 1.20-1.35 g/cm<sup>3</sup> during the growing season, and it is maintained in optimal conditions. The correct and rational use of any means of production largely depends on how deep and comprehensive the study of its important features is.

As a result of the active influence of man on the soil, changes in its properties, increase or decrease in productivity, salinization, erosion, dehumidification, rational use of non-irrigated dry land in agriculture, and its protection require more attention than before.

So, first of all, it belongs to the soil, its rational use, increasing the productivity of the soil, knowing its quality, economic value, protection, successive planting of various plants according to the condition of the soil, ecologically “clean” methods of soil treatment, fertilization it is required to conduct at a high level.

Increasing the productivity and productive capacity of the soil must depend to a large extent on its careful and economical treatment and the complex aimed at its improvement.

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