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AGRARIAN ECONOMICS AND SOIL FERTILITY

(In the example of Surkhandarya)

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Annotation: This article focuses on the results of the economic efficiency of the economy of the agrarian sector and soil fertility, the main factors that cause a decrease in soil fertility today, and the measures to be taken in the reclamation of salt marshes on irrigated lands. The article focuses on the negative consequences in the biosphere, especially the cause of the ecological problem of the soil, and the issue of finding a solution.

Key words: Agro-ecological problems, soil structure, irrigation-melioration, natural-geographical, hydrogeological, morphological characteristics, organic and mineral fertilizers, saline lands, barren soils.

Today, the seriousness of agro-ecological problems in the world community, negative consequences in the biosphere, especially the ecological problem of soil, is one of the most urgent problems before soil scientists.

On December 10, 2017, the President of the Republic of Uzbekistan Sh.M. Mirziyoev spoke on the day of agricultural workers and expressed the following opinion about agriculture: “First of all, effective use of land and prevention of its looting is one of the most important tasks. There is only 3 million 300 thousand hectares of irrigated land in the country, and there is no way to increase it. This could be because water resources are limited in Uzbekistan. There are difficulties in irrigating 830,000 hectares of land. 445,000 hectares of the most fertile land across the country were given to the population as homesteads. But its use is not at the level of demand.”

A.N. Rozanov (1951), A.E. Zaychikov (1957), soil scientists of the republican soil expedition (1960) called the soil of the fields of the Surkhandarya branch of the Cotton Scientific Research Institute of Uzbekistan as “barren soil”. However, in connection with the construction of the “Uchkizil” water reservoir in the upper part of the area where these soils are spread, due to the change of the hydrogeological conditions in the area, that is, as a result of the continuous absorption of water from the reservoir and non-concrete water networks into the soil, the increase of underground seepage water

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and up to 1.5-3.0 m to the soil surface that hydromorphic soils appeared due to the fact that the elevation caused the moistening of the soil layers, in 1967, under the leadership of soil science scientists V.V. Valiev, N.M. Mallaboev, P.N. Besedin, 35 soil pits in the fields of the Surkhondarya branch were dug up to underground seepage water (1 -3 m) and soil samples (monoliths) were taken and analyzed in the laboratory. They made a 1:5000 scale soil map and agrochemical cartograms and classified branch soils into meadow soils.

The territory of the region is complex geological, geomorphological, and mythological. It has hydrogeological climatic conditions, different soil and plant cover. It is located in a favorable geographical environment for the development of agriculture between the Bobotog and Boysun mountain ranges.

According to the information of Termez and Sherabad district meteorological stations, the first frost in the region will start from November 2-24. On March 2-12, the average temperature is observed in the range of 17.3-17.8 0C. The amount of annual precipitation varies, and the highest amount is observed in February, March, and April. In the oasis, the transition from spring to summer happens quickly. For example, if the average overnight temperature in February is 5-6 0C. It reaches 11.3 0C in March and 17.7-18.5 0C in April. A strong wind called “Afghan wind” blows in the south-west direction in the southern districts and covers the sky with yellow sand particles. As a result, many young shoots in early spring are severely damaged. Most will die. Harmsel, a dry and hot air current carried by a dust storm, also causes great damage to agricultural crops. During the wind, evaporation (transpiration) in plant organs increases, the surface of the soil dries up, and the demand of plants for water increases sharply. Crop elements and flowers of agricultural crops are shed. After the end of the wind, the air temperature will drop to 2-3 0C during the next two to three days. At the end of spring and the beginning of summer months, the relative humidity of the air decreases under the influence of the wind, the amount of evaporation in plants increases, which causes a lot of shedding of crop elements, combs and flowers that have appeared in young shoots. As a result, a sharp decrease in the weight of the crop obtained from the soil causes a decrease in economic efficiency.

According to the specific characteristics of the soil and climate conditions of the Surkhandarya region, two soil-climate regions can be distinguished in the region:

1. Bald. Brown sandy desert soils with a reddish tint. Baldness is developed; the southern part of the region or low plains is a desert area;

2. The northern part of the region or the area of the sub-mountain and sub-mountain plains where

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mainly gray soils are spread.

Soils distributed in the Surkhandarya oasis and their agro-ecological problems. In terms of the structure of the earth's surface, the territory of Uzbekistan is divided into two parts: 78.7% of it is plain, 21.3% consists of mountains and swamps between mountains.

Light gray soil is spread in places of Surkhandarya natural geographical area up to 500 m above sea level (Termez 302 m). Saline gray soils are found in places where groundwater is close to the surface. Alluvial meadows and swampy soils are found in the banks of the Surkhandarya and Sherabad rivers, and sandy and loamy soils are found in the sand massifs in the southern part. The total credit rating of regional lands is 60 points. Of this, 562.7 thousand ha are irrigated, 279.5 thousand ha of arable land, 776.7 thousand ha of perennial trees and pastures. The part used for agricultural production is 1089.2 thousand. 272.8 thousand are irrigated fields, 57.9 thousand are cultivated land (corresponds to 14% of the total land fund of the region).

Normal and dark gray soils are scattered in the part of the country from 500 m to 1200 m altitude. Such soils have been exploited in many places and turned into cultural gray soil.

On the slopes of the Surkhandarya at a height of 1600-2500 m, mountain-brown soils are spread, the humus content of which is 4-6%. Above 2500 m, the pasture region begins, and mountain-meadow, meadow, meadow-swamp land is found.

Termez district consists of newly irrigated barren-meadow soils formed on alluvial deposits, I-II overburden terraces of Surkhandarya. Barren-meadow soils are composed of heavy loamy and salty fractions developed in the plains of the desert region.

Barren soils are a type of typical desert (desert) soils with a unique genetic structure and characteristics in the Surkhandarya oasis. These soils appeared on the subarea alluvial and pluvial plains of the Surkhandarya oasis, on the somewhat heavy and more or less saline deposits.

First, the surface of the barren soils is flat; it is distinguished by the presence of a 1-5 cm thick, red-bluish, lumpy layer consisting of cracks of various shapes. Beneath the pulp is a reddish-brown granular-granular, porous sub-layer of pulp, which is usually 6-10 cm thick. This layer alternates with a layer with a thickness of 20-25 cm, very large and small lumps covered with brownish-red oozing spots. Under this layer there is a layer of 80-100 cm with a very complex color (red, brown, with leaking points, iron rust and black-brown spots, etc.). The fine-grained layer of barren soils is usually 200 cm or more. The most characteristic morphological structure is that all genetic layers have a very heavy mechanical composition (heavy, coarse, and light). For this reason, in the development of this

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soil, it is necessary to apply agro technical and amelioration measures typical of lands with heavy mechanical composition.

The second morphological feature characteristic of barren soils is their natural compaction. At first glance, these soils appear to be very well aggregated, but these aggregates are only a simple physical appearance, they are actually "super-false" aggregates, as these aggregates change their state when wet and turn into mush as the moisture increases.

Naturally, soil is a renewable resource and its role in nature and human life is invaluable. Nowadays, it is possible to increase soil fertility and improve its condition artificially by humans. This could be because the soil, which is considered an independent rock with its natural characteristics, has been damaged by man, who is considered an anthropogenic factor.

As the causes of deterioration of the soil structure, the violation of the condition of soil use, improper implementation of agro-technical measures make it unusable, as a result, irrigation (water) erosions occur due to human influence, salinity in the soil appears and increases or it leads to swamping.

It is necessary to carry out the following main activities in the reclamation of salt marshes on irrigated lands:

1. By digging collectors and ditches around the fields, lowering the level of storm water and stopping water from rising to the surface through capillary paths.
2. Planting hedgerows around fields and irrigation facilities.
3. Washing of water-soluble harmful salts collected in soil layers (washing of cones is usually carried out in late autumn and winter).
4. Fertilization and plastering are recommended.

The most important of measures to improve the condition of saline lands is lowering of underground water, that is, digging ditches, cleaning the old ones and carrying out salt washing.

Irrigation of cultivated fields many times in one year leads to the accumulation of various salts in the soil and, as a result, to re-salinization of the soil. Saline soils are causing many problems. The following conclusions were drawn from the collected scientific research data:

- firstly, the soil is left out of agricultural use and becomes unsuitable for planting crops;
- secondly, only halophytic plants grow and it is impossible to plant other plants;
- thirdly, the fact that a very small part of the planted crops grows, and even then it does not give a harvest, the productivity decreases, and in addition, only salt-resistant crops are planted in saline lands;
-fourthly, restoration of saline lands, i.e. recultivation, requires a lot of money. That is, it is necessary

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to transfer collector-drainage to saline lands, dig ditches and clean the old ones.

To get a high yield from the soils distributed in the region:

1. Rational use of organic and mineral fertilizers based on the plan.

2. Increase the weight of alfalfa in the rotation system.

3. Prevention of soil compaction.

4. In order to reduce the cost of water, it will be necessary to implement drip, sprinkler and subsoil irrigation measures, which have proven themselves in practice.

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