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SCIENTIFIC CONCEPTS FOR SOLVING SOME PROBLEMS OF THE AGRARIAN SECTOR IN AZERBAIJAN

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1. Assessment of the state of water and land resources in Azerbaijan

The total area of the republic is 8,641,500 hectares of land, of which 55 percent of it, i.e. 4,756,500 hectares, is suitable for agriculture. or 16.6 percent of the total area, or then 1,432,600 hectares, is irrigated land.

Of the total land balance, 1,808,400 hectares are arable land suitable for agriculture. It should be noted that 181,600 hectares of the available total area of arable land are under occupation by the Armenian aggressors. 224,700 hectares of arable land, perennial crops, 117,600 hectares of hayfields, pastures of 2,560.0 thousand hectares, 45.7 hectares of fallow areas. In the country, 258,100 hectares of households (227,600 hectares of arable land), 1,038,800 hectares are included in the share of forest plantations.

Due to the increase in the population, now about 10 million people, using land for non-agricultural projects and allocated for the construction of individual buildings and structures, certain types of soil erosion have developed strongly, and on the other hand, the rise in the groundwater level as a result of the rise in rising sea levels, improper conduct of agro-meliorative measures on production areas in individual farms, the use of environmentally friendly crop cultivation technology and agricultural machinery in violation of the rules, the arable area per capita is declining from year to year.[1,2,4] If allocated to the share of one person in 1959 was 0.36 hectares of arable land, this figure was 0.23 hectares in 1970, 0.21 hectares in 1979, at the same time it decreased to 0.155 hectares in 2006 [3] .

60% of the territory of the entire territory are located in the mountainous part of the republic. Due to the influence of natural and anthropogenic factors here, it can occur in all types of erosion [5]. According to the results of our numerous studies in the field of studying the patterns of development of land degradation problems, and the land degradation in certain regions, it was found that the erosion process is very widespread (especially in mountainous areas) in the country.

Currently, more than 42.8% of the entire territory of the republic, 70-85% in some regions suffer from various degrees of erosion [5,6]. One of the biggest contributors to water and irrigation erosion.

Dominating in the republic by the duration of furrow irrigation and flow, agrotechnical measures, regardless of any land protection, agriculture, horticulture and animal husbandry, cause soil erosion [2,7].

However, the country is facing severe conditions of water shortage.

The country's water resources are 32.5 billion m3. In dry years, this figure decreases by 23.16 billion. m3.

The volume of water resources in the country hold only 30%, and the remaining 70% flow through neighboring countries [4]. It should be noted that in the face of constant water shortages, a sharply uneven distribution of water in the country, despite the economic and environmentally efficient irrigation of crops, not primitive, traditional or torrential irrigation is carried out.

The results of the study revealed that up to 96% of irrigated lands are irrigated mainly by traditional irrigation methods (furrows and flooding) by surface methods, and the rest up to 5% - while irrigated fields are irrigated using progressive water-saving low-intensity irrigation systems. Therefore, in the fields, the groundwater level is growing every day. In fact, in a number of areas, groundwater, arable land, suitable for about 1,000 thousand hectares, were subjected to salinization, which caused a particular danger in violation of the ecological balance of the country.

At present, more than 53 thousand hectares of sown areas of the Kura-Araks lowland have endured great danger as highly saline soils as a result of flooding, where household plots of the population of these regions of Azerbaijan have left the crop rotation, where thorough washing of those soils from life-threatening salts of various kinds is required. [2,4,6].

The results of monitoring studies have revealed comparative indicators for water supply of 3 Transcaucasian states: Georgia, Armenia and Azerbaijan, a follower of water resources for their 70, 25 and 10 billion km3, respectively.

The annual per capita water resources in these countries are consistently 11000, 3000, and 1500m3/person. According to the study, 2020, the annual per capita water resources of Azerbaijan, in turn, are 2 times less than in Armenia, and 7 times less than in Georgia.

It is believed that water resources are very important in the development of the economy of each country, especially in the industrial production sector, and agriculture is a key element of life.

2. Degrees of destruction according to Erosion and methods of its struggle in Azerbaijan

Degrees of soil destruction by erosion:

Grade 1 - weak erosion - occurs mainly in the form of surface washout invisible to the eye. ITS traces, in the

form of small potholes and deposits, are easily leveled in the process of agrotechnical tillage.

Degree 2 - moderate erosion - manifests itself in the form of potholes, changes the level of humus in the soil, reducing its amount, worsens the physical and chemical properties of soils. This process does not affect the formation of relief.

Degree 3 - medium erosion - intensively destroys the arable-humus layer, reaching even the parent rock. Potholes and gouges are numerous, deep and cannot be corrected as a result of the processing process, causing the formation of slope undulations.

Grade 4 - Severe erosion - destroys the entire soil profile, creating potholes and cuts that go deeper and deeper into the parent rock layer. As a result, a so-called erosional landscape appears with a characteristic dissection of the soil cover and the formation of ravines.

Degree 5 - very severe erosion - erodes the entire soil profile, along with part of the foot. This leads to severe fragmentation of the soil cover, the creation of a dense network of ravines, and the transformation of the agricultural area into waste land.

Degrees of soil destruction by wind erosion:

Grade 1 - slight erosion causes a slight blowing out of the soil of the best and most valuable colloidal, clay and dust particles. Blowing it practically does not affect the condition of the soil;

Grade 2 - Moderate erosion begins to already limit soil humus to some extent due to blowing out a large amount of mineral and organic components, compared to weak erosion.

Grade 3 - medium erosion can significantly reduce the humus content due to the significant amount of mineral and organic particles and cause damage to the crops.

Grade 4 - severe erosion leads to changes in the soil profile. These soils are subject to strong blowing, have a clearly reduced level of humus, which accumulates in wind drifts.

Grade 5 - very severe erosion leads to the formation of dunes. Heavily eroded lands should be completely covered with forests.

Such ideas became the basis for the development of a program to protect land from erosion degradation for the whole country. Large-scale accounting was carried out only in those places for which plans or projects for the development and organization of the economy are being developed. This model does not take into account.

Research Methodology

Degrees of soil destruction by wind erosion:

In order to study the areas of distribution and intensity of development of erosion processes, we used field and laboratory research methods.

The phenomenon of soil erosion and its distribution areas were studied comparatively geographically, by stationary and semi-stationary methods.

The decisive role of the terrain in the manifestation and development of soil erosion is well known. The most pronounced factors of the nature of mountainous areas are the slope of the surface, the depth of local bases and the exposure of the slopes. Therefore, on the basis of topographic maps at a scale of 1:50,000, the maps of erosion factors of the same name were compiled for the study area.

When compiling a map of surface slopes, the following gradations were adopted: 0-30; 3-50; 5-70; 7-100; 10-150; 15-200; 20-250; 25-300; 30-450; and over 450.

For the distribution of land according to surface slopes, we used the indicators of the weighted average value of slopes proposed by M.N. Zaslavsky (1979)

$$\text{Avg.wt.} = \frac{i_1 s_1 + i_2 s_2 + \cdots + i_n s_n}{100}$$

Avg.wt - the weighted average of the slopes

I1; and I2; in - the slope of the selected contours,

s1; s2;sn - areas of allocated contours, % of the total area.

Depth maps of local bases of erosion were compiled with the definition of the excess of watersheds over river channels and their tributaries, as well as large ravines and dry valleys. To compile this map, the following gradation was adopted: 0-50; 50-100; 100-150; 150-200; 200-250; 250-300;300-400; 400-500 and more than 500 m [5]

The slope exposure map was compiled on a topographical basis and the following were distinguished: northern, northeastern, northwestern, eastern, southern, southeastern, southwestern exposures.

When carrying out soil erosion studies, the classification of S.S. Sobolev was applied (the description of which is given in the book by I.F. Sadovnikov 1954). Given this classification, soils were distinguished by the degree of erosion as follows:

1. Unwashed soils - all genetic horizons are present, destruction is not observed;

2. Slightly washed away soils - no more than half of the humus horizon A is washed away, the formation of striate erosions is observed on the soil surface.

3. Medium eroded soils - more than half of the genetic horizon A is absent.

4. Strongly eroded soils - horizon A is completely washed away, and horizon B partially passes.

3. Improvement of eroded soils of pastures in Azerbaijan

The territory of the Republic of Azerbaijan is located in the eastern part of Transcaucasia, this includes the regions of the Greater and Lesser Caucasus, the Talysh zone , Kura depression. The total area of the republic is 86.6 thousand km2, about 40% of the land area is plains, the remaining 60% are foothill and mountainous areas.

The climatic conditions of the republic are diverse, being a mountainous country, at the same time the republic has vast lowlands, valleys and, due to the diversity of the relief surface, it also has a diverse climate. The republic is protected from the invasion of cold air masses from the north by the main Caucasian ridge.

Depending on the altitude above sea level, climatic conditions vary. With the rise in the mountains, the average air temperature decreases. Of the 11 climate sub-types found on the globe, we have 9 climate sub-types, lacking savanna climates and rainforest climates.

Characteristic types of soils are mountain-meadow soddy soils, then mountain-forest soils, gray-brown soils are common in the foothills and foothill plains,

gray-brown in the arid zone, yellow soils in the Talysh zone.

Despite the small area, the republic has a variety of natural conditions and rich natural resources. Pastures are one of the natural resources in Azerbaijan. The area of pastures in the republic is 22.3% of the total area.

Summer pastures make up 621 thousand hectares, winter pastures 1.5 million hectares, near-village pastures and hayfields make up about 1 million hectares.It is known that the Republic of Azerbaijan has been distinguished since ancient times by the branch of animal husbandry.

Our region with rich natural pastures and pastures located in the Alpine zone is a natural resource. However, due to various circumstances, including soil erosion, these natural food resources are losing their potential fertility. One such circumstance is soil erosion.

Erosion is the destruction, corrosiveness, as a geological term, is the destruction of the upper fertile soil layer under the influence of wind and water.

The upper layer of the earth's crust, as a result of processes occurring in nature, undergoes various changes. This process can proceed as a normal natural phenomenon, as well as intensively as a result of anthropogenic load. In any of the 2 cases, the topsoil is washed away. Regardless of the type of erosion, the most developed fertile upper accumulative horizon is carried away.

Along with water flows and the solid phase of soils, nutrients with a finely dispersed fraction are carried away and, depending on the degree of washout, the damage caused by erosion varies. It should also be noted that, along with water erosion, the manifestation of wind erosion - deflation - is also large in our country.

Wind erosion is intensively manifested in the arid zone, where the dry climate, increased wind regime, and the insignificance of precipitation contribute to the degradation of the vegetation cover.The intensity of development of wind erosion in comparison with water erosion is low. However, the damage caused by wind erosion to agriculture is colossal.

Wind erosion, on the one hand, contributes to the blowing of soil, on the other hand, to the accumulation of particles in the form of a hill, moving sands fall asleep vegetable and gourd crops, roads, construction sites, squally winds tear roofs off houses.

Natural forage lands located on eroded slopes have low productivity.

Scientific concept of solving various problems in Azerbaijan Agro

The system of surface improvement of natural hayfields and pastures consists in the fact that by improving the water, air and food regimes, caring for the herbage, for the longest time to keep fodder lands in a state of economic value.

Surface improvement is expedient in meadows where 20-25% of valuable fodder grasses are preserved in the herbage. On hayfields and pastures with the worst herbage, surface improvement does not give the desired effect, and fundamental research should be carried out on them. as in the zone of the Kura basin.

It is known that the total area of the republic is 86.6 thousand km2, where about 40% of the land area is plains, the remaining 60% is foothill and mountainous areas. The climatic conditions of the republic are

diverse being a mountainous country, the republic at the same time has vast lowlands, valleys and, due to the diversity of the relief surface, has a diverse climate. The republic is protected from the invasion of cold air masses from the north by the main Caucasian ridge.

Depending on the altitude, climatic conditions vary. With the rise in the mountains, the average air temperature drops. Of the 11 under the types of climate established on the Globe, we have 9 under the types of climate, there is no savannah climate and tropical rainforest climate.

Typical soil types are mountain meadow soddy soils, further mountain forest soils, gray-brown in the foothills and foothill plains are common in the arid zone, gray-brown, in the Talysh zone of yellow earth.

Despite the small area, the republic has a variety of natural conditions and rich natural resources. One of the natural resources in Azerbaijan is pasture. The area of pasture s in the republic is 22.3% of the total area.

Summer pastures make up 621 thousand hectares, winter pastures 1.5 million hectares, village pastures and hayfields make up about 1 million hectares. It is known that the Republic of Azerbaijan has long been distinguished by the livestock industry.

Our land with rich natural pastures and pastures located in the alpine zones is a natural resource. However, due to various circumstances, including soil erosion, these natural feed resources lose their potential fertility. One such circumstance is soil erosion.

Erosion is destruction, erosion, as the geological term is destruction of the upper fertile soil layer under the influence of wind and water.The upper layer of the earth's crust as a result of processes occurring in nature, undergoes various changes. This process can proceed as a normal natural phenomenon, also intensively as a result of anthropogenic stress. In any of 2 cases, the topsoil is washed away.

Regardless of the type of erosion, the most developed fertile upper accumulative horizon is carried away.

Together with water flows and the solid phase of the soil, nutrients with a finely dispersed fraction are carried away and, depending on the degree of washing, the damage caused by erosion is different. It should also be noted that along with water erosion, the manifestation of wind erosion - deflation - is also great.

Wind erosion is intensively manifested in the arid zone, where a dry climate, enhanced wind regime, and insignificant precipitation contribute to the degradation of vegetation.

The intensity of the development of wind erosion compared to water is low. However, the damage caused by wind erosion to agriculture is colossal.

Wind erosion, on the one hand, contributes to the blowing of the soil, on the other hand, the accumulation of particles in the form of a hill, moving sands cover vegetable and melon crops, roads, construction sites, squally winds tear off the roofs of houses. Natural fodder land located on eroded slopes has low productivity.

Scientific concept of solving various problems in Azerbaijan Agro The system of surface improvement of natural hayfields and pastures is to improve fodder land in the state of economic value by improving water, air and food regimes, caring for grass stands.

Surface improvement is advisable in meadows, where 20-25% of valuable forage grasses are preserved in the

grass. On hayfields and pastures with the worst grass stand, surface improvement does not give the desired effect, and a radical study should be carried out on them.

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