

АНАЛИЗ ЭКОЛОГО-МЕЛИОРАТИВНОГО СОСТОЯНИЯ ПОЧВЫ ЮЖНОЙ ЧАСТИ АРАЛЬСКОГО МОРЯ И ЕГО КАРТИРОВАНИЕ

ANALYSIS OF ECO-MELIORATIVE CONDITION FOR SOIL OF SOUTHERN ARAL SEA REGION, AND ABOUT ITS MAPPING

Арал деңизинин түштүгүндөгү кыйын экологиялык кырдаалга илимий изилдөө иштерин жүргүзүп, анын негизинде картографиялык методдун ролу, кыртышты картага түшүрүүнүн методдору, кыртышты экологиялык рекультивациялоонун өзгөрүшү анализге алынган.

Ачык сөздөр: Арал деңизи, экология, эко-мелиорация, эко-деградация, сугаруу, кыртыш, карта, картография.

Эта статья посвящена анализу изменения экологической рекультивации почвы и методов картирования почв и роли картографического метода на научно-исследовательской работе, основанной на критической экологической ситуации, которая произошла в южной части Аральского моря.

Ключевые слова: Аральское море, экология, эко-мелиорация, эко-деградация, орошение, почва, карта, картография.

This article is about analysis of change of eco-reclamation of soil and methods of soil mapping and the role of cartographic method on research work that is based on critical ecological situation which occurred in Southern Aral Sea.

Keywords: Aral Sea, environmental, ecological, eco-meliorative, eco-degradation, irrigation, soil, map, cartography.

Relationship between nature and human based on certain rules, its violation can lead to the eco-degradation. Aimless irrigation of the Aral Sea's main water sources the Amu Darya and the Sir Darya has led to sharp declines previous of the sea level in the geographical boundaries and to environmental disaster of the Aral Sea [3].

As President Islam Karimov mentioned – “The risk of drying up of the Aral Sea is the most critical issue that has become a national disaster”. Drying up South Aral Sea radically changed Aral Sea's natural condition, as a result dangerous ecological situation has occurred [1].

Many research works were carried out and are being carried out on natural environmental landscape and on studies for eco-reclamation of the soil of the region. In the 1980-1990s, including Z.M. Akramov., A.A. Rafiqov., I.A., Hasanov and E.Yu. Safarov came to the conclusion that study of the status of eco-reclamation of the soil and its research it is necessary to implement the cartographic method of techniques.

The major issue of the Aral Sea's ecological disbalance is pouring water to the Aral and balance disorder of regular water supply from water sources like Amu Darya and Sir Darya.

Now a large part of the Amu Darya and Sir Darya's previous wild forest trees in the foothills dried out, and the area of the reeds sharply reduced. Due to the shortage of water, previous productive pastures degraded. Because of the groundwater level went down and the increase in the level of mineralization to 10-15 times, the concentration of salt in the soil has occurred. Currently, vegetation density is extremely loosen on saline soils, topsoil is drying out and wind erosion increased. Where is the existing sandy soil there is sand content can be found. The effects of soil salinity and wind making the pasture condition even worse [2].

Now for a hectare, 9-10 tons of salt comes up with the river water and the bulk of the salt is

washed out to the existing drainage network, but in some areas there is no drainage or it is inefficient, in such areas salt regularly gathered. It can be seen on a large scale, particularly in the fields of Karakalpakistan. The existing drainage networks were not projected deeply under land (1.5-2 m), and the majority of them (30% -40%) was muddy and filled with a cane due to a lack of the ability to draw ground water, furthermore drainage networks absolutely does not exist on the 30% field. For this reason, average strong and very strong the saline irrigated land makes up 53% of the total area.

Low harvest of agricultural products for Karakalpakistan, associated with much amount of salt in the soil.

Currently, the decline of the Aral Sea level related to changes on surface and groundwater in Karakalpakistan, consequently, there has been a change in the quality of agricultural soils. The sea level continues to decline and these effects on the quality of land resources in Karakalpakistan. In addition, the deterioration of the quality of agricultural land is concentrated with the natural growth of the anthropogenic impact on the environment [4].

Since that time, mapping the status of soil eco-reclamation was carried out on a large scale.

As you know, the Republic of Karakalpakistan is situated closer to groundwater than other regions of the country. Here, large areas of irrigated groundwater level changes to 1-3 meters. In some smaller irrigated areas, water is stored below 3 meters. Groundwater level of the region depends on the level of water supply and drainage systems.

A reduction in the flow of water from the Amu Darya, insufficient water supply land areas expanded in Karakalpakistan. Part from those above, both the volume and composition of mineral fertilizers on the ground effects on component change of reclamation of irrigated soil.

Since 1999, the State Committee for Nature Protection of the Republic of Uzbekistan Pollution Sources Monitoring (PSM) program monitors soil pollution sources. Toxic substances, mineral fertilizers, toxic chemicals buried reservoirs, oil production bases and industrial facilities that are close to objects areas which used for agriculture land are belong to the PSM.

Total mineral fertilizers, which stored in warehouses on the territory of Karakalpakistan are 17, in Beruni and Chimbay there are 3 warehouses in each district. Highest toxic chemicals warehouse is in Takhiatash (4).

In Khujayli, Chimboy, Amudarya and Kegeyli districts organochlorine pesticides soil pollution rate is 5 times higher than the norm.

The emissions from thermal power station in Tahiatash also have negative impact on soil pollution in Karakalpakistan. The Takhiatash thermal power station hazardous wastes and their placement on the use of the State Statistical Report 2010, in the local company area 168.5 tons of non-neutralized toxic waste was made up, emissions mainly consist of copper, lead and oil refineries. As mentioned above, the underground water level is close to the top soil in Karakalpakistan. To improve soils reclamation condition it is important to keep a standard level of ground water. It can be done when there is just enough length and effective working drainage systems.

We consider that a positive solution to the problem is, it is necessary to carry out the mapping. Soil maps are formed in order to view geographical spread of soils, to learn land cover components and to take into account land resources. Soil map gives opportunity to increase soil fertility, rational use of agricultural land and to evaluate them for this purpose using agricultural and land reclamation measures. Therefore, the maps are provided with cartograms and a special maps defining amount of acid soil, salinity properties and other chemical elements.

In maps taxonomic sections of the soil – type, small type, species, etc. are described. Unit type was adopted as the basic in genetic soil classification. Soil types are divided in to small types. Small types, which related to same type, lie in single genetic layer, but one or a few of them have affective process character. (Figure 1).



Figure 1. Soil map for the Republic of Karakalpakstan

Soil is divided into types and small types. They differ from types according to quantity indicators, intensity level, soil formation process and the type development level of soil profile.

Large-scale map creating work in field filming or aerospace materials are carried out on the basis of decryption, small-scale maps formed by large-scale maps generalization. Soil types in nature are usually invisible to observer, so the outlines of boundaries on the map are conventional. Geologist and cartographers work together to create a map, for them it is necessary to know the nature of the soil cover of territory. To illustrate soil cover on small-scale maps the main demand is laws of soil formation in territory, their wide areas, the spread along vertical zones and the correct description of the processes that make up the soil. Based on a small-scale maps large-scale maps are formed, in this the main map creating method is generalization. The main purpose of the generalization method – description of the specific typical zonal and regional soil characteristics depending on the scale and purpose of map. V.M Fridland divides generalization work in to 3 methods that carried out during soil mapping: 1) soil classification, methods of mapping that about soil domination, or soil components and soil cover in the area; 2) work on the composition of the soil, the soil cover components of the composition, their interactions and geometrical properties; 3) generalization work on classification and ways to summarize the contents depending on the nature of the soil cover. The most widespread method is first one, it is approved in the practice of general maps production, this method has been going on since the first steps of soil cartography. Prevalent method of genesis, structure and properties of agro production soil based on unification of the one soil contour. If there is a soil with contrast and different genesis types, they are mapped by dividing them in to soil complexes or compounds [5].

In fact, mapping is one the important factors in the study of the status of environmental reclamation, increasing soil fertility and high harvesting.

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