ASSESSMENT OF AGRO-ECOLOGICAL CONDITION OF THE TERRITORY OF THE REPUBLIC OF TAJIKISTAN

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Abstract: *The territory of Tajikistan has unique natural and climatic conditions, and also differs in its complexities and characteristics. The article presents the division of the territory according to the geographic, geological and biological characteristics of the republic, gives an assessment of the ecological state of the territory of the Republic of Tajikistan, identifies the main problems in this area and proposes measures to eliminate them. For each of the newly created agricultural landscapes, depending on the altitude location, with certain violations, clear characteristics are given. Raise the issue of pollution of air and water basins of the republic, the sources of these pollution are given. Attention is focused on the quality of water, in connection with which the issue of the Aral Sea has been raised. Summarizing the highlighted environmental problems are noted, the required immediate measures to eliminate them. The elevation marks of the republic's relief surface range from 300 to 7500 meters above sea level. Such a range of heights in a relatively limited area, only 143.1 thousand square kilometers, predetermined a variety of natural and climatic conditions: from the sultry arid valleys of the South-West and North of the country to the high-altitude cold deserts of the Pamirs. Mountain ecosystems occupy from 600 to 7000 m above sea level. They concentrate from 70% to 80% of the species diversity of communities, as well as most of the summer pastures and forests. In the foothills and plains, semi-desert and desert zones are usually located. By geographic, geological and biological characteristics, the republic is divided into: Sughd-Zaravshan, Central-Tajikistan, South-Tajikistan, Gorno-Badakhshan ecological provinces. Thus, the territory of Tajikistan is represented by a variety of ecological provinces with unique natural and biological features.*

Keywords*: agricultural landscapes, ecological state, ecosystems, problems, the Republic of Tajikistan*

INTRODUCTION

The territory of Tajikistan has unique natural and climatic conditions, and also differs in its complexities and characteristics.

The elevation marks of the republic's relief surface range from 300 to 7500 meters above sea level. Such a range of heights in a relatively limited area, only 143.1 thousand square kilometers, predetermined a variety of natural and climatic conditions: from the sultry arid valleys of the South-West and North of the country to the high-altitude cold deserts of the Pamirs (SOCIAL ASPECTS OF ECOLOGY / ED. BUSLOVA K.P. - MINSK: SCIENCE AND TECHNOLOGY, 1983 .-- 232S).

Mountain ecosystems occupy from 600 to 7000 m above sea level. They concentrate from 70% to 80% of the species diversity of communities, as well as most of the summer pastures and forests.(I.B. SHULMAN,2007).

Today, the state of natural ecosystems in Tajikistan is unsatisfactory and requires studying the reasons for their deterioration. Over the course of 30 years, under the influence of anthropogenic pressure, their area has significantly decreased, and some are under threat of extinction. As a result of land development, the area of natural low and medium mountain ecosystems has also decreased.

Each of the newly created agricultural landscapes, depending on the high-rise location, has certain violations.

In low-lying areas - in areas of irrigated agriculture, the most common problem is a decrease in the bio-productivity of the territory. It arises due to a violation of the water-salt balance, leading to flooding, waterlogging and salinization of territories, as well as due to a violation of irrigation regimes and imperfection of irrigation systems. Another problem that negatively affects the ecological situation of lowland agricultural landscapes is the excessive use of pesticides, insecticides and mineral fertilizers. One of the factors contributing to the deterioration of the ecological situation on these lands was the replacement of cotton-alfalfa crop rotations with cotton-cereal (mainly wheat) crop rotations, which led to a decrease in soil fertility everywhere.

MATERIAL AND METHODS

In the foothills and plains, semi-desert and desert zones are usually located.

By geographic, geological and biological characteristics, the republic is divided into: Sughd-Zaravshan, Central-Tajikistan, South-Tajikistan, Gorno-Badakhshan ecological provinces. The characteristics and features of ecological provinces are presented in Table 1.

Table 1

Characteristics of the ecological provinces of Tajikistan

Provinces	Occupied territory	Soil	Climate	Vegetation	Animal world
1	2	3	4	5	5
Sughd-Zaravshan province	The territory of the Western Tien Shan and the north-western part of the Pamir Alai mountain system	Serozem and mountain-steppe soils	Continental, relatively dry with an average annual temperature of -2 + 7 ° C; amount of precipitation 300-350 mm per year.	Mountain forests, woodlands, steppes, tugai and semi-deserts.	Birds, insects, reptiles and mammals.
Central Tajikistan province	Occupies the central part of Tajikistan, including the Karategin, Vakhsh, Darvaz, Alai ridges, Peter the Great and Khazratishokh ridge, Karategin, Surkhob and Obikhingou intermountain hollows.	There are Paleogene-Neogene-Quaternary deposits, Precambrian formations and intrusive rocks.	The average annual air temperature is + 14-16 ° C, atmospheric precipitation is 800-1500 mm per year. There are many snowfields..	It is represented by juniper, broad-leaved, xerophytic forests, woodlands, alpine and subalpine meadows, semi-savanna and mountain steppe plants.	Almost all species of mammals and birds of Tajikistan live, about 50% of rare and endemic species of plants and animals are found.

Continuation of table 1

1	2	3	4	5	6
South Tajikistan province	Occupies the southern part of the Pamir-Alai, consisting) of small ridges Babatag, Aktau, Tuyuntau, Teraklitau, Choltau and Dzhilantau. Gradually they pass into the Parkharo-Pyanj, Vakhsh, Beshkent and Shaartuz oases.	Cretaceous, Quaternary and Neogene sediments.	The climate is dry and hot. The average annual air temperature reaches + 15-17 ° C, atmospheric precipitation - 150-200 mm per year. A significant part of the land is used for agriculture. Anthropogenic ecosystems prevail.	The vegetation cover is diverse and is represented by fragments of desert-sandy and riparian communities	The fauna is rich in reptiles, mammals, birds, among which there are many rare and endemic species.
Gornobadakhshan province	Occupies exclusively high-mountainous territory of Darvaz, Vanch, Yazgulem, Shakhdarinsky, Shugnansky, Vakhan, Ishkashim, Rushan, Zaalaysky, North and South Alichursky, Muzkolsky ridges	Precambrian rocks, intrusions of rocks of the Jurassic, Carboniferous and Triassic systems prevail.	The climate in the western part of the province is cool, sometimes harsh. The average annual air temperature reaches -2 + 7 ° C, atmospheric precipitation is 300 mm per year.	The vegetation is relatively sparse; mountain steppes, small-leaved forests, and cryophyte meadows prevail. Floristic composition does not exceed 1500 species. Arboreal and shrub communities are found in river floodplains and at the outlet of groundwater.	Large mammals are inhabited by the snow leopard, Siberian ibex, Pamir mountain sheep.

RESULTS AND DISCUTIONS

Thus, the territory of Tajikistan is represented by a variety of ecological provinces with unique natural and biological features.

Today, the state of natural ecosystems in Tajikistan is unsatisfactory and requires studying the reasons for their deterioration. Over the course of 30 years, under the influence of anthropogenic pressure, their area has significantly decreased, and some are under threat of extinction. As a result of land development, the area of natural low and medium mountain ecosystems has also decreased.

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Mid-mountainous and high-mountainous areas (summer pasture zones) are exposed to another danger - the cutting of forest vegetation. Already rare, plants are also disappearing due to indiscriminate grazing. Since pastures still do not have a clear status and restrictions on use, this leads to the development of the problem of land degradation, and ultimately to their loss.

Agricultural landscapes in high mountain areas are most at risk - land degradation and erosion. This problem develops due to improper technological and irrigation treatment.

In addition, the economic crisis of farm and agricultural enterprises negatively affects the state of agricultural landscapes. Due to the lack of land in the republic, less fertile lands have been developed, requiring special processing and certain reclamation measures. These conditions cannot be met due to insufficient financing of the agricultural sector, and, as a consequence, there is a gradual decrease in the biological productivity of such agricultural landscapes.

Thus, the ecological problems of agricultural landscapes are closely related to each other. Improper soil cultivation, erosion, loss of its fertility, continuous population growth leads to a sharp decrease in agricultural land.(ALIEV N.N ,2011)

In recent years, the area of agroecosystems has expanded due to the development of new lands and an increase in pastures. More than 1000 species of wild relatives of cultivated plants grow here, as well as a lot of fruit and berry and row crops. Due to its species diversity, Tajikistan is considered one of the world centers of origin of cultivated plants.

However, the ecological situation in the republic, as well as organizational and economic reasons, directly affect all anthropogenic ecosystems, increasing the threat of their degradation.

But the ecological problems of agricultural landscapes are far from the only ones.

Air and water pollution is one of the most acute environmental problems in Tajikistan.

According to the Hydro-Meteorological Service of the republic, the air basins of the largest natural and economic zones of the Vakhsh and Gissar republics, where a high concentration of industrial and transport pollution sources are concentrated, are most susceptible to pollution .

Maximum concentrations of harmful impurities in the air are also observed on the outskirts of the city, which is explained by the circulation of polluted air streams from industrial enterprises.

Automobile transport causes the greatest damage to the atmosphere of the republic. According to observation data for the last 6 years, the concentration of only one dust in the air was 12 MPC.(FOMENKO A.E.,2015)

After the formation of the South Tajik territorial production complex in the cities of Tursunzade, Yavan, Kurgan-Tyube, Kalininabad, new branches of energy-intensive industries appeared, which became decisive in the level of pressure on the environment (DECREE OF THE GOVERNMENT OF THE REPUBLIC OF TAJIKISTAN DATED FEBRUARY 27, 2009).

Thus, in order to improve the state of the air environment, it is necessary not only to limit emissions of harmful substances into the atmosphere, but also to transfer enterprises to more environmentally friendly types of fuel (natural gas, electricity).

Since the 70s, Tajikistan, having high indicators of water supply in Central Asia, has faced a number of problems associated with the deterioration and depletion of water resources.

The main source of pollution of the republic's rivers is the Takob fluorspar plant, the Khoja-Obigarm resorts, numerous catering establishments, camps and recreation areas, as well as household wastewater from villages(HTTPS://WWW.UNECE.ORG/FILEADMIN/DAM/ENV/EPR/EPR_STUDIES/TAJISKISTAN_II.R.PDF).

Due to non-observance of the rules for wastewater treatment, household and industrial waste, including oil products, oils, nitrites and other harmful substances, enter water bodies. Especially high concentration of harmful substances in plain and foothill water bodies.

Today, almost all existing sewerage systems of the republic do not meet modern requirements. According to the Committee for Environmental Protection of Tajikistan, the concentration level almost always exceeds the permissible values. The volume of wastewater significantly exceeds the design capacity of sewage treatment facilities.

The main indicators for the ecological suitability of water for human consumption are the value of mineralization, composition and quality of dissolved salts. The level of mineralization of the republic's waters is generally low, from 100 to 400 mg / l.

The amount of mineralization, the quality and composition of dissolved salts are the main indicators of the ecological suitability of water for drinking and other cultural and household needs. The degree of mineralization of the waters of the rivers in the basin is mostly low, but it is completely absent in agricultural water supply.(UMAROV, KH.,1998)

To solve this global environmental problem, in April 1993, the heads of states of Central Asia (Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan and Kyrgyzstan), with the participation of Russia, created the International Fund for Saving the Aral Sea. The World Bank has joined the work in this direction. An agreement was signed on joint actions to resolve the problem of the Aral Sea and the Aral Sea (POSTOLOV V.D.2019)

Thus, the unique nature of Tajikistan significantly affects the national, regional, global and ecological-economic situation in the republic. Summing up the highlighted environmental problems, it should be noted that all of them require immediate measures to be taken to eliminate them.(MUMINOVA M.O,2018)

CONCLUSIONS

To solve the ecological problems of the republic, the following can be proposed:

- development and implementation of anti-erosion measures on irrigated and rainfed lands;
- development and implementation of measures to improve land salinization;
- the introduction of environmentally sound measures for the use of pastures, primarily on winter pastures and improvement of cultivated pastures;
- expansion of areas of anti-erosion forest plantation belts;
- determination of the dynamics of the involvement of new land in the economic turnover, transformation of land development for various agricultural purposes;
- to develop and improve the ecological and economic substantiation of the system of land use, agriculture and the main directions of land protection in the republic;
- Evaluation of the effectiveness of air security measures for each enterprise and technological line;

- development of systems of measures to improve its condition, reduce the volume of the ingredient composition into the environment;
- creation of a data bank on the state of air pollution in various climatic conditions and emission regimes;
- strengthening the requirements of environmental legislation on sources of water resources;
- improvement and reconstruction of the irrigation network in the republic;
- establishment of a control regime for the state of glaciers, lakes and other types of groundwater.

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