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THE SOUTH-WEST HISOR: SIGNIFICANCE, ANTHROPOGENIC IMPACTS AND PROTECTION MEASURES

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ABSTRACT

This article describes mountains and their importance in human life, anthropogenic impact on the mountain and sub-mountain landscapes of Southwest Hisar, its consequences, and measures to improve the geocological situation.

KEYWORDS

Mountains, mountain landscapes, landscape, relief, anthropogenic, pastoralism, irrigated agriculture, dry farming, industry.

INTRODUCTION

The increase in the number of the world's population, as a result, provides them with natural resources and rational use of nature. This, in turn, causes an increase in man-made destruction, chemical pollution, desertification, melting of glaciers, soil degradation, and other negative environmental processes in landscapes and the natural environment in general. To combat these problems, international organizations, in

particular, the UN, are developing many programs and concepts. One of the 17 goals defined in the UN program for sustainable development until 2030 is aimed at solving the tasks of "...protection and restoration of terrestrial ecosystems, their rational use, rational management of forests, combating desertification, stopping land degradation and preventing the loss of biological diversity."

The main results and findings

Mountains are a geosystem rich in fresh water, mineral and forest resources, biological and landscape diversity, morphostructural landforms and unique natural features. Also, mountains are a natural geographical object that gives people wonderful aesthetic feelings, attractive touristic and recreational resources, and helps to feel the feelings of pride and national identity.

Today, 15 percent of the world's population lives in mountainous regions. Half of the world's biodiversity is found in mountains. About half of the world's population depends on mountain ranges for water, food and energy. Mountains cover almost 27% of the Earth's surface. Not only do they directly support the lives and well-being of the 1.1 billion mountain people living in the mountainous regions, but they also indirectly benefit billions of people living below.

More than 90 percent of people living in mountainous areas are residents of developing countries. Therefore, in many developing countries, a unique ethno-ecological culture has emerged among peoples and mountains. This can be clearly seen in the case of countries such as Nepal, Tajikistan, Peru, and Bolivia.

Mountains provide 60-80% of all fresh water in the world. Therefore, their importance as a resource is incomparable.

The countries of the world pay great attention to the optimization of the geo-ecological situation in the mountainous regions, to the research of their landscapes, to the implementation of nature protection measures.

In Uzbekistan, in the field of ecology and environmental protection, a number of measures are being implemented to use the natural resource

potential of the regions on a scientific basis, to improve the ecological conditions in geosystems, to fight against various environmental problems, and to ensure that the population lives in an ecologically safe environment.

The 79th goal of the "Development Strategy of New Uzbekistan for 2022-2026" is: "Elimination of existing ecological problems that harm the health and gene pool of the population", and the 80th goal is "Protection of ecology and environment, improvement of the ecological situation in cities and districts, Implementation of the nationwide project "Green Space" [2] and important tasks such as "...scientifically ensuring the solution to the problem of environmental protection" [3] in the "Environmental Protection Concept" of the Republic of Uzbekistan until 2030 specified. These tasks require carrying out scientific research aimed at optimizing the geo-ecological conditions, especially in the arid climatic and arid regions of Uzbekistan, including the mountainous and sub-mountainous landscapes of South-western Hisar.

Mountain and sub-mountainous regions are rich in natural resources. That is why, in the early stages of human society, civilization was formed in mountain valleys.

It is known that every person, every family and nation, nation and nation live, form and develop in areas with certain natural ecological conditions, adapt to it. For this reason, man is a child of nature and a product of the landscape, and nature is his mother and creator [9; p. 8].

Natural complexes of mountain slopes, valleys and mountain plains are constantly changing under the influence of gravity, large slope, mountain-valley winds, underground and surface water flow and other

factors. As a result of human economic activity, the placement of industrial enterprises on mountain slopes and valleys leads to environmental pollution, destruction, and loss of circulation.

The variability of mountain and sub-mountain complexes is determined by factors such as the composition of the rocks that make them up, the slope of the slope, the degree of vegetation cover, and the nature of human economic activity [5].

The watery parts of the South-western Hisar ranges consist of a glacial (permanent snow and glaciers) region. Due to the extreme complexity of the natural conditions, the instability of the climate above 4000 meters above sea level, the change of the ecological environment has not been greatly influenced by man.

The slopes of the mountains at an average height (from 1200 to 1500 m to 3000 to 3500 m) are mainly occupied by forests - juniper groves, in the lower part, walnut groves, almond groves, holly groves, hawthorn groves, pistachio groves, and various shrubs and tall grasses. Most of the mountains of Uzbekistan are characterized by the sparseness of forests at this height, and sometimes they have already disappeared. That's why the slopes are very deep, steep ravines have formed, the soil has been washed away in many places, and fragments of rocks have been exposed as a result of weathering.

The mountain includes river valleys and their banks, several erosion-accumulation terraces and slopes of different slopes. Their natural conditions have had a positive effect on the development of all sectors of the economy since ancient times.

It is known that large landslides have occurred in the upper reaches of Topalangdarya, in the valleys of Ohangaron and Ugom rivers, and the annual decrease of vegetation from mountainous hills (for example, east of Guzor hills) to the mountains, as a result of which soil erosion is rapidly developing.

The biodiversity of the mountain region ensures its stability. In terms of numbers and species, the number and type of representatives of the animal world is higher in the mountains than in the plains. Most of the mammalian predators belong to the mountain region. But in recent years, the reduction of biodiversity in terms of species and quantity has a serious impact on the stability of mountain geosystems.

The environmental situation in Uzbekistan is generally moderately stable, and varies from satisfactory to catastrophic in some places. The watershed parts of high and medium-altitude mountains have the most convenient and comfortable situation, because human economic activities are practically not carried out in these geosystems. Human influence begins to be felt on the slopes of the mountains, and disturbances in the structure and functioning of ecosystems are observed in the upper parts. Vegetation, animal world, partly changes in the soil.

According to L. Alibekov (2006), at present, as the territorial division of labor deepens, the interdependence of the economy of the mountains and plains is increasing. At the same time, the integration of adjacent mountains and plains - that is, the regulation of river flows, the alternation of seasonal pastures (ie, from the mountains to the plains, from the plains to the mountains), and the provision of pulse crops and fruits to the population - is increasing [3; 11].

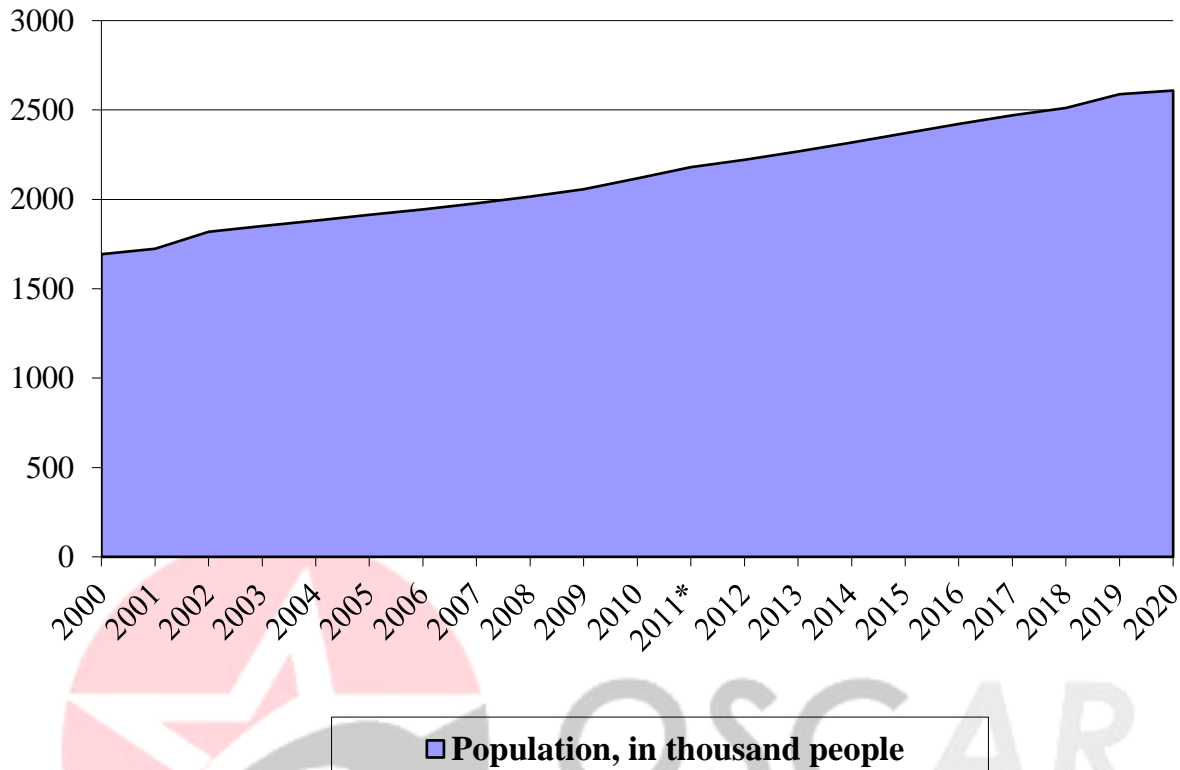


Figure 1. Population dynamics in the mountainous and mountainous districts of southwestern Hisar (2000 – 2020)

Approximately 31.2% of the population of more than 6 million people living in South Uzbekistan (40.5% of the population of Kashkadarya region, 19.8% of the

population of Surkhandarya region) corresponds to the mountainous and mountainous regions of Southwestern Hisar (Table 1).

Table 1

Location of population in mountainous regions of Uzbekistan and its south* (as of January 1, 2022)

	Uzbekistan Republic	Kashkadarya region	Surkhandarya province
Total population, thousand people	35271,3	3 408,3	2 743,2
	100	9,66	7,78



Of this, in the mountainous and mountainous regions, a thousand people, %		1660 48,7	1560 56,8
A thousand people in the mountainous and sub-mountainous region of southwestern Hisar %	2150 6,1	890 39,5	810 29,5

* The table was compiled by the author based on the information of the State Statistics Committee of the Republic of Uzbekistan.

The following situations were identified as a result of anthropogenic influence in the landscapes of the mountainous and mountainous regions of southwestern Hisar:

- disruption of the stability of ecological systems and changes in the appearance of natural landscapes;
- use of low areas of relief for disposal of sewage and waste water;
- preparation of medicinal, food and technical plant raw materials for industrial processing;
- use of toxic chemicals (pesticides) to protect agriculture and other plants;
- hunting animals, cutting trees and bushes;
- changing the hydrological regime of rivers and streams;
- operation of industrial facilities, their construction, renovation.

With the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 541 dated September 7, 2020 "On further improvement of the mechanism of environmental impact assessment", the list of activities subject to the State environmental expertise was approved. Highways, reservoirs and dams of national and international importance, mining and beneficiation factories, mining mines of ore and chemical raw materials, recultivation of mines formed during mining,

cleaning and mining of accumulated ore materials in river and stream beds, 34 types of activities are included: exploration, exploration, mining and well-equipment of fuel resources (oil, gas, coal, etc.) [2]. 17 of them are found in the mountainous and mountainous regions of South-western Hisar.

As a result of the negative impact on nature, a number of ecological changes are taking place in the southwestern branches of the Hisar ridge. For example, in the basin of the Kashkadarya river, which includes the slopes of the South-western Hisar mountains, a large area has been turned into unsuitable land for agricultural use as a result of the development of landslides. Thrust phenomena developed more strongly in Jinni Darya, Kichik O'radaryo, Aksuv and Katta O'radaryoni basins. More than half of the basin area of these rivers is doomed to erosion processes. 12% of its soil cover is strongly washed, 40.5% is moderately and weakly washed [8; 58.].

The lower limit of the forests on the eastern slopes of the Surkhantog and Ketmonchopti ridges has risen by several hundred meters to approximately 1700-1800 meters. Of course, a few decades ago, their limit was not like that. Reduction of the area of forests causes the active passage of dangerous natural geographical



processes. It is known that forests can act as a major barrier in preventing and countering many hazardous natural geographic processes. For example, the influence of forests on the movement of a single wind starts to be felt from a distance of 250 m, and on the movement in the opposite direction from the forest, from 1500 m. The wind speed in the forest does not exceed 1m/sec [6; p. 54].

Among the 314 species of plants belonging to 49 families included in the "Red Book" of Uzbekistan, 135 species belonging to 35 families are found in the mountainous and sub-mountainous landscapes of South-western Hisar, and about 80 of them are endemic to Hisar. In the "Red Book" of the Republic of Uzbekistan, plant species are given 4 statuses according to the degree of rarity, and the status of 1 species found in the South-western Hisar mountain and sub-mountain landscapes is 0 (lost or not likely to be lost); 52 species status 1 (endangered); 40 species status 2 (rare); The status of 42 species is 3 (decreasing in number). Of these 135 plant species, 73 species are not under any protection or protection measures have not been developed.

The following are the main reasons for the decline of plant species in the mountainous and mountainous landscapes of southwestern Hisar: continuous development of mountainous areas, irregular grazing of livestock, continuous and unreasonable collection of seeds by local residents for the perfume industry and as medicinal raw materials, various insects being damaged by, adapted to special conditions, resistant to changing environmental conditions, etc.

In the Adir region of the Kashkadarya basin, the share of poisonous and weedy grasses in the pastures, the development of cattle breeding, dry farming, and irrigation farming are the main influencing processes, which accelerated the degradation process in the Adir

region compared to the mid-mountain and high mountain pastures [7; p. 21].

It is very important to study the interrelationship between animals and their habitats of mountain and mountain regions, and landscape research is of particular importance. Today, the decrease in species and number of animals due to various impacts requires the study of the fauna of mountain geosystems in a landscape-dependent manner. Landscape zoogeography is important in this. Landscape zoogeography - reveals patterns of distribution of animals across landscapes and regions.

When studying the reasons for the decrease in species and numbers of animal species in the mountainous and sub-mountainous landscapes of South-western Hisar, it became clear that there are specific reasons, along with general reasons specific to all regions (climate change, poaching).

There are a number of anthropogenic activities in the use of the mountain and sub-mountain landscapes of southwestern Hisar. Among them, directions such as mountain-pasture animal husbandry, dry farming, forestry, picking of medicinal plants, recreation tourism, hunting, and fuel production have accelerated somewhat.

Currently, there are three main sectors in the structure of agricultural use of the mountainous and sub-mountainous landscapes of South-Western Hisar - pastoralism, irrigated or valley farming, and dry farming.

The conducted studies and analysis of the literature show that the main sources affecting and polluting the mountainous and mountainous landscapes of Southwest Hisar are: 1) toxic man-made waste from industrial enterprises; 2) toxic chemical compounds



used in the cultivation of agro-landscapes and used in the fight against harmful insects; 3) various toxic gases emitted from motor vehicles; 4) waste from household enterprises; 5) local winds that have a negative impact on the environment; 6) wastes emitted by cities and large villages.

We believe that it is desirable to have a unique agricultural culture in the oases and pastures of the hills and to make effective use of these landscapes. It is necessary to limit the irregular movements of livestock in the hills, to graze in the upper parts of the mountains in a very short period of the year, when the capacity of the hills has increased. To do this, farmers, farms and homesteads in villages located around hill oases, small rivers and streams should be planted with fodder and nutritious crops - alfalfa, corn, barley, sugar cane, etc. Planting hardy trees and creating gardens is important.

In order to maintain, increase and protect the productivity of dry soils and to use the land effectively, to introduce alternating sowing of grain crops with perennial grasses, as well as leguminous and oil crops, to prevent erosion processes, to place crops according to soil and climate conditions, to establish surrounding tree groves, pistachios, It is advisable to use such technologies as planting almond, walnut, cranberry and grape plantations, and preserving moisture for a long time by plowing.

In dry lands, hedgerows are very important in preventing or slowing erosion processes. Due to the reduction of evaporation, hedgerows provide an opportunity for better wetting of the surface and preservation of snow during the winter. In the summer, hedgerows help to absorb rain into the soil. Slope terracing and selection of agricultural crops to reduce erosion are important tools for increasing the productivity of drylands. According to experiments,

tobacco, corn, polys-vegetables, essential oil, medicinal crops do not slow down erosion processes and, on the contrary, somewhat accelerate them. Cereals and legumes greatly reduce soil erosion, while perennial grasses almost eliminate erosion processes.

In the use of land resources as pastures, it is necessary to pay serious attention to nature protection. Because all types of soils of pastures are affected by the processes of erosion (washing) expressed to different degrees depending on the features of the terrain. Also, the use of pastures without taking into account the bioecological conditions of plants in the vegetation cover complicates the conditions for the natural recovery of plant resources and leads to the thinning of the vegetation cover. Thinning of vegetation, in turn, leads to increased water and wind erosion, leaching or leaching of organic matter from the soil, and ultimately to a decrease in the productivity of pastures.

In order to reduce the process of erosion in mountain and mountain areas, preservation of the existing vegetation cover on the mountain slopes, in addition, planting and propagation of trees; irrigation taking into account the slope of the slope in agriculture; establishment of horticulture (including intensive horticulture) in hilly and mountainous areas with favorable natural climatic conditions [4; p. 58] is necessary.

CONCLUSION

It is expedient to carry out measures of nature protection and improvement of the geoecological situation in the mountainous and sub-mountainous landscapes of South-western Hisar on a complex and typological scale. We believe that the following measures should be implemented in order to comprehensively optimize the geo-ecological situation



in South-western Hisar mountain and sub-mountain landscape complexes:

- sufficient use of natural and agro-climatic opportunities of mountainous regions. This includes improving agricultural specialization and territorial use of land resources of each mountainous district;
- on the basis of available mineral resources in mountainous areas, to establish industrial enterprises with low impact on the environment in this very place and to provide these enterprises with local personnel in this area;
- establishment of unique "resource", "resort" and "smart" cities in mountainous regions. To do this, select districts with such opportunities (Shahrisabz, Kitab, Boysun, etc.) and apply the experiences of foreign countries (for example, the USA, Switzerland, Germany) on the basis of their centers or second-level (higher-rated) cities;
- organization of regional addresses of non-traditional for our country, but possible to develop - skiing sports, agro- and gastro-tourism industries in mountainous areas;
- construction of water reservoirs below glacier areas and tree plantations in treeless open areas can reduce the impact of climate warming on glaciers. In this regard, it is necessary to use the experience of the countries of Italy and Tajikistan;
- establishment of special scientific and research institutions that study mountain areas in a complex manner (in natural, socio-economic, agrarian, etc. fields) and attract to them local specialists who can fully experience the mountain as much as possible;
- maintaining, increasing and protecting the productivity of mountain soils and efficient use of land;

- establishment of cultural forests with high fertility on a scientific basis in mountain and sub-mountain areas;
- to establish surrounding tree groves that mitigate the effects of strong winds and dust storms, to effectively protect against soil dust and soil erosion, to increase the number of trees and shrubs such as pistachios, hawthorns, almonds, apples found in the local flora, and to expand the area of mountain forests at the expense of high hills;
- development of environmental culture among mountain youth through geography, biology, chemistry, development of specific measures for the protection of the nature of mountain areas;
- organization of regional location of population service industries in mountainous areas, together with medium-sized cities, district centers and large towns.

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