

*Nazarov A.A.
Doctor of Geographical Sciences, Associate Professor
Koriyev M.R.
Doctor of Philosophy in Geographical Sciences
Uzbekistan, Namangan, NamSU.*

THE EFFECT OF CLIMATE CHANGE ON NATURAL GEOGRAPHICAL PROCESSES (FOR THE EXAMPLE OF FERGANA VALLEY)

Abstract: This article describes the specific features of the natural geographical processes occurring in the Fergana Valley. Also, the impact of climate change on the natural geographical processes of the Ferghana Valley has been studied.

Keywords: global climate change, natural geographical processes, environmental protection, natural landscapes, anthropogenic factors.

*Назаров А.А.
Доктор географических наук, доцент.
Кориев М.Р.
Кандидат географических наук, доцент
Узбекистан, Наманган, НамГУ.*

ВЛИЯНИЕ ИЗМЕНЕНИЯ КЛИМАТА НА ПРИРОДНЫЕ ГЕОГРАФИЧЕСКИЕ ПРОЦЕССЫ (НА ПРИМЕРЕ ФЕРГАНСКОЙ ДОЛИНЫ)

Аннотация: В данной статье описаны особенности природно-географических процессов, происходящих в Ферганской долине. Также изучено влияние изменения климата на природно-географические процессы Ферганской долины.

Ключевые слова: глобальное изменение климата, природно-географические процессы, охрана окружающей среды, природные ландшафты, антропогенные факторы.

The geomorphological structure of the Fergana Valley plays a key role in the formation of unique natural processes. The natural processes that have formed and can occur in the Fergana Valley are distinguished by their location, cause, scale, associated material damage and other characteristics. Nowadays,

one of the most important tasks is to forecast the occurrence of natural disasters, to warn the public authorities and the population about the impending disaster. Geophysical, geological, hydrogeological, atmospheric and other factors play a key role in the formation of natural disasters in the regions of the Fergana Valley. Earthquakes, landslides, mudslides, floods, and floods occur relatively often in the valley. This, in turn, causes material damage to the national economy to varying degrees, and puts people's lives in danger.

The surface of the Fergana valley rises in steps depending on the height. The central part of the valley, occupying areas with an absolute height of 300-400 m, and the part up to the current valley of the Syrdarya River, is considered the first step, and in this area, mainly there are salt marshes, places of lakes and sand dunes. The regions of the Fergana Valley at an altitude of 400-600 m are the second level, which occupies the expanses of rivers and partly streams. The regions of the relief of the Fergana valley, rising to a height of 600-1200 m, consist of adyrs. This is the third step, rocks, gravel, mud and clay mixed rocks and low elevations are characteristic of the adyrs. The mountains above 1200 m and surrounding the valley form the fourth level. They consist of strongly broken, sloping slopes. This division of the relief causes an increase in the slope.

By the 70s of the 20th century, the hills of the Fergana Valley were developed for the purpose of irrigated agriculture. By organizing the development of viticulture, horticulture and other types of agricultural industries in the hills, hilly lands with complex topography have begun to be strongly transformed. The adyrs are the main land fund in the valley and are widely used in irrigated agriculture. As a result of such exploitation of hills, non-compliance with agrotechnical rules of irrigation, unique natural and natural-anthropogenic processes are taking place. These include soil erosion, landslides, soil salinization, impoverishment of flora and fauna. Such a situation can be found in the cultivated hills of Kosonsoy, Turakurgan, Chust, Pap, Chartak, Yangikurgan and Uchkurgan, Beshariq, Sokh, Rishtan, Kuva, Markhamat, Asaka, Khujaabad,

Kurgantepa, Khonobad districts of the valley. At present, inappropriate and unsatisfactory processes related to irrigation development have intensified in the area of more than 250,000 hectares of the Northern and Southern Fergana adyrs. Also, one of the biggest problems related to irrigation is the rise of groundwater in the lower parts of the mountain slopes (Chartak, Yangikurgan, Kasansay, Beshariq, Rishton, Kuva, Tashlak, etc.), has also led to increased waterlogging and salinization. For example, the exploitation of Chartak adyrs has caused groundwater to escape from residential areas (Fig. 1).



Fig. 1. Consequences of development of Chartak adyrs

Another of the most active and noticeable natural geographical processes in the Fergana Valley is the process of ravine erosion. The process of ravine erosion occurs under the influence of natural, anthropogenic and combined factors. A. Nigmatov and A. Dadakhojhayev (1995) studied the processes of ravines in the hills of Northern Fergana and their causes.

According to the results of the conducted research, in order to prevent such natural processes, it is necessary to plant trees on the slopes, improve the condition of meadows, open the old floodplains and valley roads, timely repair

existing floodplains and it is appropriate to use other hydrological measures. Adyr region is one of the most influential regions of the valley, and the impact of the activities carried out here is reflected not only in them, but also spreads to the lower regions. Therefore, development and use of hills requires careful attitude.



Fig. 2. Consequences of development of hills (ravine erosion) (adyrs of Northern Fergana).

Currently, there are flood-prone areas in the mountainous and sub-mountainous zones of the republic, which is about 46,000 km². In particular, the stepped structure of the Fergana Valley is the basis for the occurrence of floods and landslides. These processes were studied by S.A.Shuvalov (1957), F.K.Kocherga (1962), A.Saidovlar (1971). According to them, floods and floods are formed under the influence of: 1) the structure of the surface layer of the place, 2) relief and geomorphological factors, 3) hydrolithological factors [1, 2, 3]. As a result of heavy rainfall and rapid melting of snow in Kurama, Chotkal, Fergana, Turkestan and Aloy mountain ranges surrounding the Fergana valley, floods often occur in Chartak, Yangikurgan, Kasansay, Turakurgan, Chust, Pap, Sokh, Rishton, Kuvasay, Khonobod, Markhamat districts. Flood events are seasonal in nature. Floods that occur in streams in the foothills and hills increase in early spring. Because in these regions, the amount of rain is high in March-

April, and at this time, the soil has a lot of moisture. As a result, a 1.4-1.6 times increase in rainfall causes floods and floods to increase by 1.1 times in March and up to 3 times in April. The magnitude of the terrain slope also causes floods and landslides. For example, as a result of an increase in the amount of precipitation, floods and floods increase 1.5 times in areas with a slope of 10 degrees, and 2.8 times in areas with a slope of 20 degrees [1]. The presence of lakes with natural dams (Kurbankol) in the mountainous regions of the Fergana Valley remains a risk of flooding. In this place, the flood that occurred on the night of July 7-8, 1998 in the village of Shahimardan of Fergana region caused a huge disaster. Due to the sudden warming of the air, the melting of snow accelerated and a large flow of water appeared. This flow joined the Shahimardan stream, increasing its water capacity by 200-300 m³/sec, and as a result of the strong flow, 52 households and 36 recreation centers were damaged. Also, the construction of hydrotechnical structures of various sizes in the Fergana Valley increases the risk of flooding. For example, on May 1, 1979, the flood that occurred as a result of the failure of the Chartak reservoir caused the flooding of agricultural fields and partially residential areas in the district.

Plants is the main factor in reducing the occurrence of flood events. In mountainous and sub-mountainous areas, the abundance of plants increases the infiltration of rainwater into the soil, which reduces the risk of floods and landslides. The lack of plants helps the snow to melt quickly and the rainwater to form a stream without being absorbed into the ground, which increases the risk of floods and landslides. In accordance with this, it is necessary to implement measures such as regulation of the use of mountain slopes as pasture, prevention of cutting down of trees by the population (Table 1.).

Table 1.**The degree of change in the nature of the Fergana valley**

Rate of	Areas	The main problems observed
Weak	Sub-mountainous and mountainous	Erosion, deforestation, permanent change and pollution of the natural environment during the extraction of minerals, landslides, improper use of pastures, vegetation degradation, floods and landslides, mountain collapses, karst phenomena, snow cover 'chkili
Average	Adyrs	Permanent irrigation erosion, floods and landslides, erosion, suffocation, soil salinization and swamping in adirorti plains, vegetation degradation
Strong	The plain	Atmospheric air pollution, groundwater rising, salinization, wind erosion, waterlogging, siltation of collector and drainage networks, pollution of open water bodies, generation of domestic waste are characteristic.

In short, the high anthropogenic pressure on the nature of the Fergana Valley is causing geocological problems. From this point of view, solving the ecological problems arising in the process of using nature, studying them on a scientific basis, and ensuring the stability of its protection are among the urgent issues of today.

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