

# IMPACT OF CLIMATE CHANGE CONDITIONS ON THE DYNAMICS OF THE FERGANA FLOOR LANDSCAPES

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## ABSTRACT

*Changes in the nature of the Fergana Valley under the influence of climatic factors, changes in climatic indicators, effects on soil, vegetation and water resources under the influence of climatic indicators have been studied.*

**KEY WORDS:** *climate and climate resources, temperature, precipitation, windy, landlocked*

The general climatic features of the Fergana basin, rather than the geographical location of the valley, to be surrounded by high mountain ranges surrounding the valley, valley it is characterized by the fact that the dry subtropical climate region belongs to the continental climate type and is located in the berg basin in the central part of the Eurasian continent.

Due to the fact that the Fergana bog is located in the middle of a huge arid climate, the dry season lasts here for a long time, the lack of natural moisture in the soil cover during the vegetation period of plants requires the need for artificial irrigation in agro-landscapes.

Climatic characteristics of Fergana bog, including oases Abolin, A.A. Skvortsov and Yu.A. Skvortsova, B.P. Alisov, S.A. Sapojnikova, L.N. Babushkin, E.N. Balashova, O.M. Zhitomirskaya, O.A. Semyonova, E.N. Balashova, O.M. Zhitomirskaya and others, Chelpanova, V.E. Chub, B. from Uzbek scientists. We can find it in the researches of Kamalov, Yu. Sultonov, R. Kholikov, K. Boymirzaev and others. The agro-climatic resources of Namangan, Andijan, Fergana regions are widely covered in the reference books.

Researching the changes in the water regime of rivers of the Fergana basin, which have basins with different natural geographical conditions, and identifying the differences between them is important from both scientific and practical points of view. This will allow the main sectors of the national economy to be warned about the changes that can be expected in the water resources of the valley under the conditions of climate change and to make corrections to the plans in time.

The Fergana basin is very rich in climatic resources and is suitable for growing all kinds of agricultural crops and obtaining high yields from them. Here, the annual total of the average daily temperature above 10 °C is 3800-4600 °C. The sum of temperatures above 10 °C, which are beneficial for agro-landscapes, is 2200-2400 °C. A thermal resource with such an indicator fully allows all types of agricultural crops to be planted and ripened. For example, early-ripening cotton 1720 °C, late-ripening cotton 1960 °C, peanut 1400 °C, sesame 1450 °C, rice 1440 °C require useful temperature. In addition, the climatic conditions of the Fergana basin allow harvesting of most crops twice a year.

The relative humidity of the air in the Fergana basin was slightly lower than it is now, before the development of the Fergana basin for the purpose of planting irrigated agricultural crops. Nowadays, the increase of irrigated cropland, the expansion of irrigation channels and the construction of many artificial reservoirs lead to an increase in the relative humidity of the air in a large part of the valley.

In the summer months, the average temperature of the air of the oasis, as one of the changing factors, is greatly reduced due to the influence of human activity. For example, the air temperature in oases is lower by 2.5-2.0 °C in the summer months compared to the desert geocomplex due to the abundance of irrigated crops and the evaporation of a lot of moisture from cultivated plants. The relative humidity of the air is 8-11% and the absolute humidity is higher than 5-7%.

A slightly higher temperature is observed in the north-western part of the exit from the valley, on the south-western slopes of the mountain and at altitudes of 300-500 m above sea level in the mountainous region as a result of air compression in winter. The northern slopes of the mountains south of the depression are the coldest.

According to climatic conditions, the Fergana basin can be divided into barren and desert zones. The desert climate zone mainly occupies the plain in the middle of the valley and the foothills with gray soil. The boundary between these two zones is not sharp, but it passes through the upper part of the Isfara range, the Sokh range, and the lowland between the Sokh-Isfayramsoy range. Then the border extends to the north. Passing around the western edge of the Aravon-Shahrikhansoy range, in the west, from Boz district to Syrdarya, and from there it stretches westward along the stream of Syrdarya, bypassing the Chust-Pop hills, to the slope of Pungon, through Okbel, Akchop and Supatov hills to the Khojand gate of the Fergana basin. Such demarcation of climate zones was reflected in the 1960 soil-climate zoning scheme of Uzbekistan by A.Z. Genusov, B.V. Gorbunov, and N.V. Kimberg .

The major regional centers of Andijan, Namangan, and Fergana are located in the desert zone. On the border of the desert zone there are settlements such as Khojand, Konibodom, Kokan, Pop, Jomashoy, Boz, Bagdad, Yozyovon. The arid climate of the desert zone is characterized by sharp changes in temperature, with hot summers and cold winters. The annual solar radiation in the plain of the desert zone is equal to 240 kcal/cm<sup>2</sup> or, in other words, it is not less than the radiation of the tropical region. The presence of such a large heat resource is primarily explained by the fact that the sun is stationary for a long time in relation to the ecliptic plane and there are many cloudless days in the hot season of the year.

In the central part of Fergana, the average annual temperature of atmospheric air is 13.5C, passing through the middle part of the Isfara and Sokh ranges and the northern part of Nasriddinbek, Andijan, Jalalabad and Namangan. The average annual air temperature can be 13-14 °C in Central Fergana, up to -7 °C in the highlands . The highest temperature in July is 26-27 °C in the bottom of the valley, 9 °C in the high mountains, and 3-4 °C in some places. The minimum monthly temperature is observed in January and is -2 -3 °C in Central Fergana, up to -19 °C in the highlands . The temperature rises above 0 °C in the center of the valley in early February, at 2000-2500 m in late March and early April, and at 3500 m in mid-May. For every 500 m increase in relative altitude, the onset of summer is delayed by 10 days on average.

One of the main features of the climate of the Fergana basin is the extreme dryness of the western part of the central plain. Here, according to meteorological data, the annual rainfall is 80-90 mm. This amount is the lowest amount of annual precipitation throughout Uzbekistan. As you go from this place to the west, north, east and south, the amount of rain increases. According to I.A. Ilin, 50 km to the west and 100 km to the east of this place, that is, in the central plain, the amount of rain is twice as much, and this is confirmed by meteorological observations (see Table 1.1).

The average monthly temperature of winter in Besharik is -2.2 S, Ultraman -2.3 S, Kokonda -2.2 S, -0.2 in Nasriddinbek Makes S The lowest temperature is -27 -28 S. With the onset of spring, the temperature rises rapidly. In mid-April, the average monthly temperature is 14 will be more than s. The average temperature in July is 25-28 to C, with a high of 42 in the east S, 46 west It goes up to S. Annual rainfall is about 100 mm. Toward the east and northeast, the amount of precipitation gradually increases and turns into a barren climate of a gray soil region. The largest amount of precipitation occurs in winter and early spring, accounting for 70-90% of the annual precipitation. Summer and autumn are characterized by dry and cloudless days. Snow cover is kept on the ground for 20-40 days.

The influence of the wind on the oasis landscapes of the Fergana basin, especially on the complexes of agricultural nature, is quite large. One of the main features is the daily change in the direction of the winds in the shallows. Mountain-valley winds are developed, moving from the mountain to the valley at night, and from the shallows to the mountain during the day. Average monthly wind speed is not high, 1.5-3 m/s. Strong winds are associated with the arrival of cold air and cumulus clouds. The number of windy days with a speed  $\geq 15$  m/s is not very high - 4-7 days a year, sometimes 10-12 days in the foothills. However, such winds can be observed 20-50 times a year in the passes of Aloy Mountain. Its influence increases especially from the east to the west of the valley (see Table 1.1) (see Figure 2.2). Below we present the number of days with average strong winds (15 m/s and above) according to the data of Ko'kan, Nasriddinbek, Namangan and Uchkurgan meteorological stations.

Table 1.1

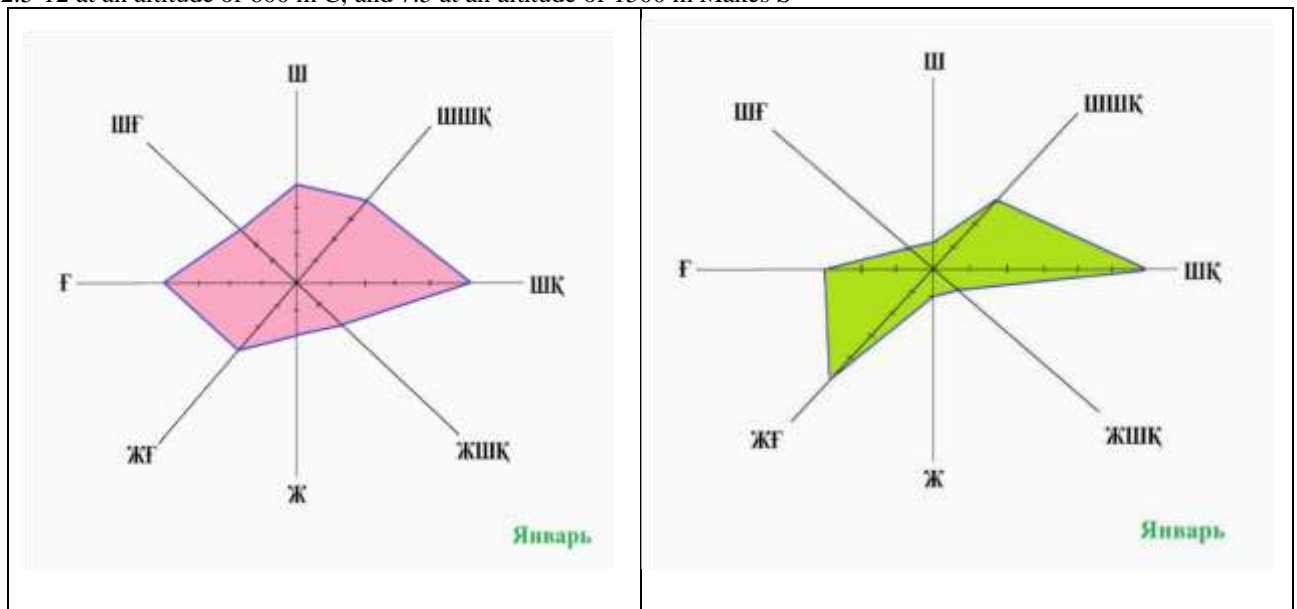
Duration of winds blowing at a speed of 15 m/s and higher in climate zones

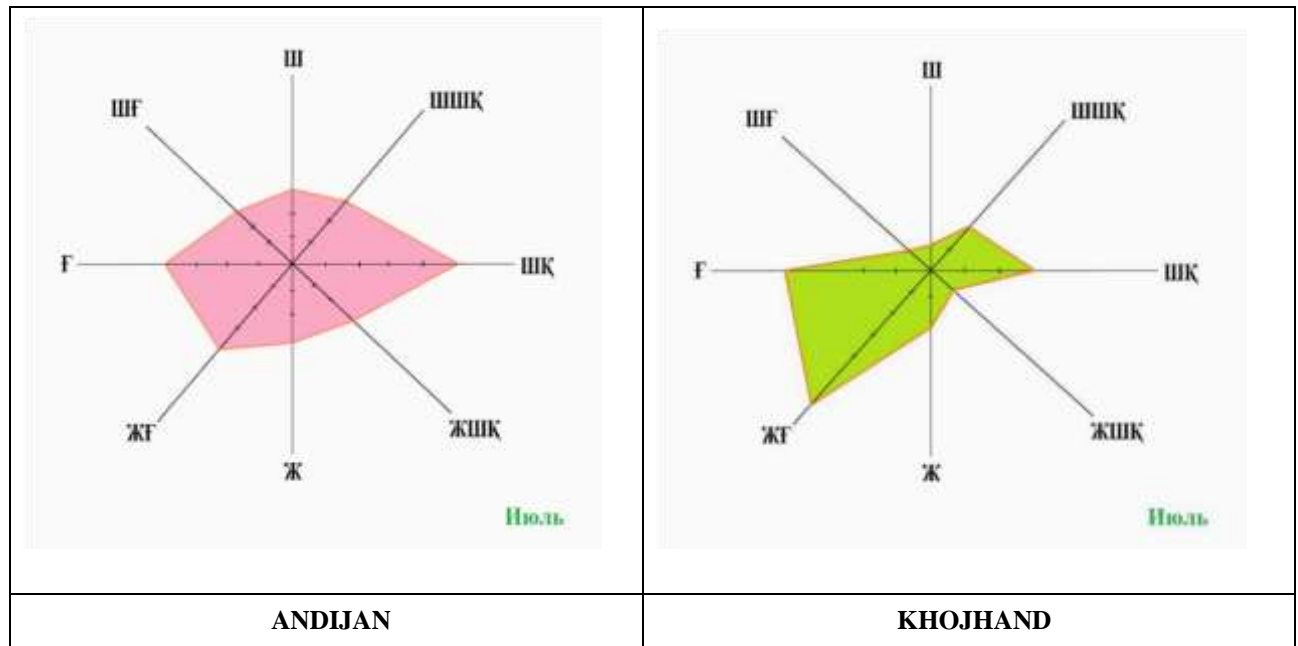
Months	Desert zone		Chalachol zone		
	Besharik	Kokan	Ferghana	Khanabad	Andijan
I	3	1	0	0	0
II	3	2	1	0	0
III	6	5	2	1	0
IV	5	6	3	1	1
V	5	6	4	2	1
VI	2	3	4	1	1
VII	2	3	2	1	0
VIII	3	3	2	0	0
IX	2	3	2	0	0
X	4	3	2	0	0
XI	4	2	2	0	0
XII	3	2	1	0	0
Yearly	42	39	23	6	3

1. As can be seen from Table 1, in the western part of the Fergana Basin, strong winds frequently recur in March, April and May, causing great damage to the oasis landscapes of Ko'kan, Yaipan, Besharik, Khojand, especially their agricultural complexes. Therefore, in order to improve the local agro-climatic conditions in this area, it is necessary to implement measures to further expand the surrounding forest regions.

2.

One of the most characteristic features of the climate of Central Asia is that there is a very high chance of evaporation. of O.M.Chelpanova according to information, this indicator corresponds to 1200-1500 mm in the Fergana basin. In addition to the general climatic conditions, the local mountain-valley and monsoon winds are also characteristic of the Fergana basin. They are usually caused by warm air rising during the day, then cooling down in the evening and blowing down into the valley or from above. These winds are especially active in winter. The average annual air temperature in Northern Fergana at an altitude of 450-500 m above sea level is 13.5 S, 12.5-12 at an altitude of 600 m C, and 7.5 at an altitude of 1500 m Makes S





3. Figure 2. Wind directions

A significant decrease in temperature in winter leads to freezing of the soil cover. At 1500 m above sea level, the average temperature from May to September is 10 will be higher than S. The lowest temperature was observed in Podshuta and it was -33 By S, the average number of cloudy days is 52%. There are 132 cloudless days in Namangan and 97 in Podshuta, and 79 cloudy days in Namangan and 103 in Podshuta. Annual rainfall is 200 mm at 450-500 m above sea level, 250 mm at 500-600 m, and at an altitude of 1000 m, the most rainfall occurs in March-April, and at an altitude of 1000-1500 m, in May. The thickness of the snow cover increases along the route Namangan-Podshoota. For example, in Namangan, the thickness of the snow cover is 16 mm, while in Podshuta it is more than 20 cm.

The climate of Eastern Fergana differs from other parts of the valley in its moderation. Winds characteristic of Western and Central Fergana will be very rare. In Kampirrovot, more easterly winds are observed. Strong winds with an average speed of 4-5 m/s occur 2-3 times a year. The average annual air temperature in Andijan is 13 S, 12 in Kampirrovot S, 9.7 in Jirgatal, 200 m above sea level S. 10 in Eastern Fergana The hot period over C lasts about 7 months. Relative air humidity in Kampirrovot is 49-55% in summer and 78-85% in winter, and 30-72% and 62-71% in Jalalabad. The annual amount of precipitation in Eastern Fergana is 300-500 mm. Such conditions allow for the wide development of arable and spring farming.

In general, the climate of Eastern Fergana is very favorable for sustainable development of agro-landscape complexes. South

The mountainous parts of Fergana are located in the desert and desert climate zones. The climatic characteristics of the Isfara, Sokh and Qatrantov plains located in the west of the desert zone are similar to the climate of Central Fergana. The climate of the south-eastern part of Southern Fergana reminds the climate of Northern Fergana. As you go south from Fergana city towards Shahimardan and east towards Osh, the amount of atmospheric precipitation increases. This indicator is 170 mm in Fergana and 350 mm in Osh.

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