

# Water Sources of the Southern Fergana Landscape and their Role in Recreation

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## ABSTRACT

This article provides information on water sources in the Southern Fergana landscape and their role in recreation.

Rivers, lakes and groundwater make up the water resources of the region. The foothills and plains of the region belong to the area that hydrologically consumes and evaporates water, and the mountains to the south of it from the surface and groundwater runoff.

The Syrdarya is a transit river that begins and flows out of the region. Its left bank to the middle stream flows at a certain distance to the Kayrakkum Reservoir, creating recreational landscapes in the region.

The main rivers flowing into the region are the Sokh, Isfayram and Isfara rivers, which are actively involved in the formation of recreational landscape complexes. Some of them start in the Alay Mountains (Isfayram, Shohimardon), while Isfara is a fast-flowing mountain river that starts from the Turkestan ridge. As they emerge from the mountains, the water of these rivers divides and spreads into irrigation canals and ditches, none of which reaches the Syrdarya.

One of the rivers abounding with water in southern Fergana is the Sokh. It starts from the Matchokh mountain node, which is separated from the Alay, Turkestan and Zarafshan mountains, by a glacier at an altitude of 5549 m. It flows through a deep and narrow ravine in the upper reaches of the Sokh River. Here the average depth of the river valley is 1190 m, and the average slope of the slopes is 27 degrees. Such a gorge-like depth of the valley not only creates a unique landscape, but also helps to draw and collect the surrounding groundwater. As the river rises to the hillside, the river valley widens. Finally, near the village of Sarikkurgan, the river rises to the plain and forms a classic conical spread with a width of 70 km and a length of 50 km. The basin is 66 percent shale, 20 percent limestone, 7 percent granodiorite, and 7 percent conglomerate, sandstone, clay, and gravel. There are many glaciers in the Sokh river basin and they are located at a much lower level (2650-4400 m). There are 99 glaciers with a total length of 211 km and an area of 170 sq. Km in the upper reaches of the river, but according to new data, the number of these glaciers has decreased significantly. These glaciers cover 6.9% of the river basin. Sariqkurgan water distributor, Oqchi hydroelectric power station and a water distributor have been built at its foot. Each of these waterworks is a unique spectacle of the recreational landscape. Sokh provides water to the arable lands of the Dukhan oasis districts The Isfayram River begins with small glaciers on the northern slope of the Alay River. Near the village of Uchkurgan, the river water is distributed to irrigation canals. Near the village of Polmon, the Quvasoy canal receives water from it. The main river of of

Quvasoy is Besholshisoy in the region. It is called Yazyovonsoy.

42 % of the Isfayramsay basin is covered with limestone, 27% with shale and 23% with granodiorite. In the middle and upper reaches, forest-shrubs and meadows occupy 23% of the basin.

It is the second largest glacier in the Isfayram river basin after the Sokh river. Its basin consists of 72 glaciers with a total length of 109 km, with an area of 134 sq. Km. or 6 percent of the basin. The glaciers in this basin are located 500-600 m above the Sokh basin, and their lower parts are covered with moraines. The abundance of small lakes and moraines around the glaciers is one of the important recreational landscape features of this river basin. There are 26 lakes in the basin, with a total area of 1.6 sq. km.

The Isfara River starts from the Shirov Glacier on the northern slope of the Turkestan ridge. It rises 78 km southeast of Konibodom to the plain part of the valley, forming its own conical distribution.

52 % of the river basin is covered with shales and sandstones, 28% with limestones and 12% with granodiorites. Forty percent of the basin is thickly covered with vegetation. In the upper reaches of the basin, there are 34 glaciers with a length of 102 km, with a total area of 88.7 sq km, or 5.8% of the basin. The glaciers here are 170 m higher than the glaciers in the Sokh Basin.

The Shokhimardonsoy is formed by the confluence of the Aksu and Koksuv rivers near the village of Shokhimardon, starting from the northern slopes of the Aloy ridge. It is divided into Margilansay, Oltiariqsay and Fayziobodsay in the village of Vodil.

46% of the basin area is covered with limestone, 15% with shale, 11% with granidiorites and 17% with current deposits. Shrubs, forests and pastures cover 40% of the basin. At the headwaters of the Shokhimardonsoy are 20 glaciers with a total length of 41.5 km, which occupy 52.6 sq km or 3.7% of the basin area.

According to the V. L. Schultz classification, these rivers, which belong to the type saturated with ice-snow water, have a flow regime typical of this type of rivers. The maximum watering period in these rivers is July-August, and the lowest flow is March-April; Between July and September, more than 40 percent of the annual flow is in the Sokh and Isfara rivers.

Due to the height of the catchment areas and the saturation of perennial snow and ice water, the amount of water flowing in these rivers varies little from year to year. This is because the amount of runoff generated by the melting of ice

and perennial snow is determined not by the amount of oil burned in the same year, but by the heat balance. In July-September, the heat balance fluctuates less from year to year, and is almost constant over the years.

In terms of water resources, the total area of glaciers in the basins of the Sokh, Isfayram, Isfara and Shohimardon rivers

is 345.3 sq. km. With ice water flowing from so much area, 138,000 hectares of land can be irrigated (I. A. Ilin).

The annual flow of river water varies with the seasons, which is one of the main factors determining the nature of the seasonal load in the recreational-landscape areas.

**Table №1 Seasonal distribution of flow**

(as a percentage of annual)

| Rivers       | Spring | Summer | Autumn | Winter |
|--------------|--------|--------|--------|--------|
| Sokh         | 10.3   | 61.6   | 20.8   | 7.3    |
| Isfara       | 11.5   | 60.2   | 16.4   | 11.7   |
| Isfayram     | 16.9   | 49.7   | 20.1   | 13.3   |
| Shokhimardon | 16.4   | 45.1   | 22.3   | 16.2   |

The rivers named above are different in terms of turbidity. The average annual turbidity of water at their outcrops is 0.13 kg m<sup>3</sup>, and in the distance from Isfayram to Sokh it is 0.2 kg m<sup>3</sup>. 500t per year from the area of 1 sq. Km of the Sokh river basin. , Isfara 200t. , Shokhimardon brings 100 tons and Isfayram brings 39 tons of ice (I.A.Ilin).

There is the Shursuv River between the Sokh and Isfara rivers. It starts from the Isfara-Logan sediment and carries the flow collected from groundwater and wastewater through a deep valley in the Guzan-Burgan ridge to the plain near the village of Karimdevona. It is a low-water stream.

The water supply of the region is characterized by the lack of natural lakes. The conditions under which a lake is formed in this area are not sufficient. Although the relief conditions that form the lake are sufficient, there is no atmospheric precipitation and no excess water reserves that form the lake. There are lakes such as Kolikubbon and Yashil lakes in the upper reaches of the Shohimardon river basin, and only a few temporary lakes on the left bank of the Syrdarya.

Kolykubbon is located 7 km south of the village of Shokhimardon, in the valley of the Koksuv river, the right tributary of the river, at an altitude of 1724 m above sea level. Kulyubbon is a lake formed by the accumulation of water by collapsing the mountain slope and blocking the Koksuv valley as a result of a strong earthquake. The length of the dam along the river is about one kilometer, the width (at the highest point of the dam) is 160 m and its height above the water surface is 20 m. Tugan is composed of rocks of various sizes from the marbled limestones of the Paleozoic period. Some of them have a cross section greater than 15m.

The lake stretches from north to south for 700m in length, 200m in width, 130m in area and 5-10m in depth. The bottom of the lake is covered with mud and the sand lies in a mixed state. The shores are steep and high, but the southern coast is flat and covered with sand. The lake deposits are mainly composed of sediments brought by the Koksuv River and rocks that have eroded from the rocks. In the middle part of the lake, dolomite piles form inverted folds. The area of the lake is shrinking year by year due to the fall of many light rocks into the lake where the folds are bent on both shores.

The water of the lake is fresh, the clarity is 5-6m in July-August. On the hottest days, the top layer of water heats up to 15 degrees, the color is greenish-airy. However, its color changes throughout the day. It is dark blue in the morning,

green in the open air on a sunny day, and red at sunset. The color of the lake water is determined by its clarity and absorption of sunlight. The purer the water, the clearer its blue color, and the rocks in the water give the lake water a green, yellowish-green hue.

The lake is mainly filled by the Koksuv River. The water of the river increases in July-August due to the melting of ice and snow in the mountains. The lake has four glaciers with a catchment area of more than 11 sq. km. The water level of the ash rises from May and peaks in August-September. From October, it will start to decline again. Such fluctuations in the water level are mainly due to the difference between the amount of water in the Koksuv River that flows into the lake and the amount of water that seeps under its dam. During the winter months, the lake is mostly filled with groundwater, its water surface drops sharply, becomes shallow and freezes.

As a result of the low temperature of the lake water and the rapid change of its level, it is poor in flora and fauna. Due to the fact that the river water is flooded by the lake, its amount does not change dramatically during the year depending on other rivers. For example, the difference between the water consumption of the Sokh river in the months of the highest and lowest months is 110 m<sup>3</sup>, in the Isfara river - 40 m<sup>3</sup>, in the Shokhimardonsoy river - 14 m<sup>3</sup>, in the Koksuv river this amount is only 2 m<sup>3</sup> sec. The shores of the lake are covered with rose hip, camel thorn and tamarisk bush, and the slopes are covered with spruce and various shrubs. In general, there are a lot of poor, bare areas for ornamental plants behind the arid climate and insufficient humidity, not to mention the mountain slopes around the lake.

At a distance of 100-150 m to the south of the lake there are small but very beautiful Yashil and Aydinkol lakes. Due to the complex mountainous terrain, these lakes are shaped like a crescent moon, the western part of which is open to the Koksuv River. The area of the ash is about 5 hectares, with a depth of 1-5 m. The bottom of the lake is muddy and rich in organic matter, the water temperature rises to 15-20 degrees on sunny summer days.

The green lake is saturated with the water of the small Archali river, which flows into it from the south-west, the spring water from the foot of the western slope, and partly from the Koksuv river. The Koksuv River flows into the lake from late May to late August. The lake supplies its water to Koksuv through a small ditch that flows from the northeast. In dry years, the lake water almost dries up.