UUT 551.491.6

SURFACE AND UNDERGROUND WATER REGIME OF BUKHARA REGION'S IRRIGATED LANDS

Radjabova Makhliyo Makhmudovna
Lecturer at the Bukhara Institute of Natural Resources Management, National Research University Tashkent Institute of Irrigation and Agricultural Technology Email: radjabovamaxliyo33@gmail.com
Dustov Jahongir Akhmad *ugli*
Lecturer at the Bukhara Institute of Natural Resources Management, National Research University, and Tashkent Institute of Irrigation and Agricultural
Shodiyev Shodiyor
Student of Bukhara Institute of Natural Resources Management of the National Research University of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers.
Hamdamov A'zimjon
Student of Bukhara Institute of Natural Resources Management of the National Research University of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers.

Abstract. *In this article, we discuss the geographical location of the Bukhara region, the benefits and harms of water resources for the lands of the Bukhara region, the fact that many lands in the Bukhara region have become unusable due to salinity, and the information about the surface and underground water resources of the Bukhara region.*

Key words: *irrigated area, salinity level, salt stains, collector-drainage water, salt content in the soil, salinity, irrigation norm, mineral content of groundwater*.

Bukhara region, the entire Amudarya delta is located in a closed basin within the Turan. Its sharp continental dry subtropical climate is one of the factors affecting the occurrence of surface and underground water, their life, and their location on the territory.

Amudarya is considered the largest river in Turan; it starts from the northern slope of the Khindikush mountain range at an altitude of 4900 m. Its main tributaries start from the Pamir-Aloy mountains. Amudarya is first called Vakhajjir at its source, then Vakhan river; after joining Vakhan river with Pamir river, it is called Panj, and at the place where Panj joins with Vakhsh river, Amudarya is named. The Vakhadjir-Vakhandaryo-Panj section of the Amudarya is 1137 km long, and it includes several tributaries: Tunt, Bartan, Yazgulyam, Vanch, Kyzilsuv on the right side, Kokcha river on the left. After joining the Panj Vash river, the largest right-hand branches of Amudarya are Kofernigon, Surkhandarya, and Sherabad, and Kunduzdarya flows on the left.

In the rest of Amudarya, it cannot add any other network for 1257 km. The total length of Amudarya is 2574 km. Amudarya flows in its lower part with a number of deltas. The earliest delta of Amudarya begins in Tuyamo`in district. Amudarya has formed a number of large and small deltas since ancient times, until it flows from Tuyamoyin to the Aral Sea. They are called Bukhara and Sarikamish deltas, Aqchadarya (Jana River), and Arolodi deltas in the geological strata of the Bukhara region. The territory of the Bukhara region includes the Bukhara and Sarikamish deltas. Amudarya divides into several branches in its delta. The largest of them are Aqchadaryo, Konadaryo, Daryalik, Erkindaryo, Kazogdaryo, Ko`ksuv, O`lidaryo, Aqdaryo, Kipchikdaryo, and Inzhenero`zak.

The area of the catchment area in the mountainous part of Amudarya is 199.3 thousand km2. The main territory of this area corresponds to the lands where the Pamir and Aloy mountain systems are located. Their average absolute height is 5000–5500 m, while some of them are above 6000 m or even 7000 m above sea level.

The main branches of Amudarya—Panj, Vakhsh, Kokcha, and others are fed by ice and snow waters. Branches starting from the lower parts of the mountains (Kunduzdarya, Kafirnigan, Kyzilsuv, Surkhandarya, and others) are also fed by snow and ice water [1]. In general, 79 km3 of water is collected annually in the mountainous part of the Amudarya basin. Therefore, until the 1960s, on average, 63 km3 of water flowed past the city of Kerki and 46.6 km3 past the city of Nukus.

Amudarya is one of the richest rivers in terms of turbidity, and 1 m3 of its water contains 2.6 kg of turbidity. The reason is that the Amudarya starts from the highest mountains in Central Asia, so it flows very fast and erodes itself and its banks. According to some data, 84 million More than a ton of various broken rock flows This makes the Amudarya water very muddy. After the river reaches the plain, it erodes the banks of Karakum and Kyzylkum and makes the river water muddy again. The reason is that the coasts of Karakum and Kyzylkum consist of loose alluvial rocks. Water turbidity near the city of Kerki corresponds to more than 4 kg of mud per 1 m3 of water. Amudarya sludge is considered a valuable fertilizer, and according to Uzbek scientists, it brings an average of 2 tons of carbon, calcium, potassium, and various chemical solutions to each hectare of land. Also, chemical elements such as table salt, Glauber's salt, soda, and khakoza are found in the river water.

Currently, as a result of the construction of the Tuyamoyin reservoir in the Lower Amudarya region, very little silt flows into the fields of Bukhara. The reason is that the Tuyamoyin reservoir is a water purification basin for 7.5 billion gallons of Amudarya water. The annual flow of the Amudarya River is 79280 mln m3. Here, the turbidity flowing from the upper reaches of the Amudarya settles and carries less turbidity to the lands located downstream. But as a result of mowing the banks of Tuyamoyin, the Amudarya water becomes even more muddy.

The Tachyatash dam is the structure that clears the water for the current Amudarya delta. [3] Amudarya freezes in winter, its thickness reaches 30–40 cm in January and

February. The thickness of the ice varies depending on the warm and calm winter. In the Bukhara region, a number of canals receiving water from the Amudarya have been built, and these canals can be divided into three systems [2].

1. Interstate and intrastate trunk canals: Tashsoka, Qilichniyozboy, Shavot, Gozovot, Mangitarna, Khankaarna.
2. Inter-farm canals Pitnakarna, Urgancharna.
3. Canals, ditches, and more ditches within the farm.

In 1939–1941, the Toshsoka canal serving Uzbekistan and Turkmenistan was built. It enables the integration of old irrigation systems from the Polvon, Gozovot, Shavot, and Khanka streams.The length of the Toshsoka main channel is 175 km, and it has the ability to supply more than 50 villages with water. Toshsoka, Qilichniyozboy, Oktyabrna, Urgancharna, Pitnaarna, Sovetyop, and other canals were combined into a single southern Bukhara irrigation system.

The Tuyamoyin reservoir was built in the southeast of the Bukhara region. Near the village of Pitnak, Amudarya flows through hard rocks and forms Pitnak elbow. In particular, this place was named Tuyamoyin. Tuyamoyin is the largest water reservoir in Central Asia; it includes the Kaporas, Sultansanjar, and Kushbulok coves. A large salt mine from Sultansanjar is left under the reservoir. The area of the reservoir is 650 km2, and its construction began in 1969. Launched in 1978. A large hydroelectric plant was built in the Tuyamoyin reservoir. It consists of a dam 181 meters long and 28 meters high, as well as a hydroelectric complex 550 meters long.The Tuyamoyin hydroelectric dam consists of 12 gates, each of which has the capacity to pass 54 m3 of water. The water distribution facility on the left bank of the reservoir transfers 500 m3 per second, and such a facility on its bank transfers 90 m3 of water. The average depth of the reservoir is 20 meters; in some places it reaches 40 meters. Tuyamoyin collects the autumn and winter water flowing from Nurak HPP. However, the construction of the Tuyamoyin Reservoir has a capacity of 7 billion m3, and it is capable of supplying up to 5 billion m3 of water to the countries of Uzbekistan and Turkmenistan.

The central Bukhara collector, Halach, and other collectors and ditches are among the largest in the region.There are also hundreds of kilometers of closed drains in the region.

In my future research, I will devote the Bukhara region to drinking water while at the same time improving the agricultural lands of the region.

REFERENCES:

1. The drip irrigation method is a guarantee of high yields. JA Dustov, NS Xusanbayeva, and MM Radjabova, "IOP Conference Series: Earth and Environmental Science", 2022

2. НАУЧНЫЕ ОСНОВЫ ВЛИЯНИЯ ПОДЗЕМНЫХ ИСТОЧНИКОВ НА ГОДОВОЙ ПРИРОСТ РАСТЕНИЙ В СОВРЕМЕННЫХ ПРИРОДНЫХ УСЛОВИЯХ ШР Ахмедов, ИН Турсунов, ММ Ражабова - Экономика и социум, 2022

3. Sug'orishda yer osti suvlaridan ratsional va ekologik xavfsiz foydalanishning ilmiy asoslari (kungaboqar misolida) SR Axmedov, IN Tursunov, MM Rajabova, and SH Hakimov, Science and Education, 2022

4. Scientific basis of the effect of groundwater sources on annual plant growth under current natural conditions SR Akhmedov, XT Tuxtaeva, ZU Amanova... IOP Conference Series: Earth and Environmental Science, 2023

6, Application of drip irrigation technology for growing cotton in Bukhara region B Matyakubov, D Nurov, M Radjabova, S Fozilov - AIP Conference Proceedings, 2023

7.ЗАПАСЫ ПОДЗЕМНЫХ ВОД БУХАРСКОЙ ОБЛАСТИ И ИХ ЭФФЕКТИВНОЕ ИСПОЛЬЗОВАНИЕ **ММ Раджабова, А Зулфиев, М Эргашев - СОВРЕМЕННАЯ НАУКА И …, 2023 - naukaip.ru**

8. **Akhmedov, S. R., Tuxtaeva, X. T., Amanova, Z. U., Tursunov, I. N., Hakimov, S. H., Rajabova, M. M., ... & Mirzayev, S. (2023, February). Scientific basis of the effect of groundwater sources on annual plant growth in current natural conditions. In *IOP Conference Series: Earth and Environmental Science* (Vol. 1138, No. 1, p. 012034). IOP Publishing.**

9.Влияние экологической обстановки на состояние здоровья населения Узбекистана АП Аминовна Международный научно-образовательный электронный журнал «ОБРАЗОВАНИЕ И НАУКА …

10.MAIN SOURCES ATMOSPHERIC AIR POLLUTION (ON THE EXAMPLE OF THE CITY OF BUKHARA). AP Aminovna, US Khurshidovich Finland International Scientific Journal of Education, Social Science …