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THE FORMATION OF IRRIGATION SYSTEMS IN THE ZARAFSHON OASIS AND THE HISTORY OF THEIR INITIAL STAGES

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Annotatsiya: Zarafshon vohasi Markaziy Osiyoning qadimiy vohalaridan biri bo'lib, u asosan Zarafshon daryosi havzasida joylashgan. Vohaning relyefi, iqlimi va yer osti suvlarining chuqurligi sug'orishga katta ehtiyoj tug'dirgan. Qurg'oqchil va yarim qurg'oqchil iqlim sharoitida dehqonchilik yuritish uchun suv manbalari muhim ahamiyat kasb etgan. Zarafshon daryosi bu ehtiyojni qondiruvchi asosiy manba bo'lgan. Ushbu maqolada Zarafshon daryosi irrigatsiya tizimining shakllanishi va uning dastlabki bosqichlari tarixiga oid ma'lumotlar tahlil qilingan.

Kalit so'zlar: Zarafshon, O'rta Osiyo, irrigatsiya tizimi, suv resurlari, qadimgi deltalar.

Аннотация: Зарафшанский оазис — один из древних оазисов Средней Азии, расположенный в основном в бассейне реки Зарафшан. Рельеф, климат и глубина залегания грунтовых вод оазиса создавали большую потребность в орошении. Водные источники имели большое значение для земледелия в условиях засушливого и полузасушливого климата. Река Зарафшан была основным источником этой потребности. В статье анализируются сведения о формировании оросительной системы реки Зарафшан и ее ранних этапах.

Ключевые слова: Зарафшан, Средняя Азия, оросительная система, водные ресурсы, древние дельты.

Abstract: The Zarafshan Oasis is one of the ancient oases of Central Asia, located mainly in the Zarafshan River basin. The relief, climate and depth of groundwater in the oasis created a great need for irrigation. Water sources were of great importance for agriculture in arid and semi-arid climates. The Zarafshan River was the main source of this need. The article analyzes information about the formation of the Zarafshan River irrigation system and its early stages.

Key words: Zarafshan, Central Asia, irrigation system, water resources, ancient deltas.

INTRODUCTION. The Zarafshan River is located between the Amu Darya and Syrdarya basins, and in terms of the level of water content, it is much smaller than them, but its importance in the national economy of our Republic is

incomparable. Today, the water demand of the neighboring Republic of Tajikistan and the Samarkand, Navoi, and Bukhara regions of our republic located in the Zarafshan oasis is mainly met by the water of the Zarafshan River. It is worth noting that the Zarafshan oasis is one of the most densely populated regions of our country, and the lands of the oasis have been drinking water from this river since ancient times. At the same time, since ancient times, water has been taken from Zarafshan to the lands of Jizzakh and Kashkadarya. This requires special study of the rivers and streams formed in these mountains from a hydrometeorological point of view, and appropriate research in this regard. The above-mentioned facts indicate the relevance of the topic of the graduation thesis.

LITERATURE ANALYSIS and METHODOLOGY. The Zarafshan River is a freshwater river located in the Zarafshan, Turkestan and Hissar mountains. Its total area is 556.7 sq km, it receives water from more than 400 glaciers and permanent snow. 65% of the annual flow of the Zarafshan River is formed by the melting of ice and snow, 34% is snow water, and only one percent is rainwater. Therefore, the water of the Zarafshan River increases precisely in the summer season, that is, in June-September, when water is needed for agricultural needs. During these months, the Zarafshan River passes more than 60% of its annual flow. The lowest water consumption falls on the winter season. On the contrary, the period of highest water flow falls on summer, sometimes reaching 165 cubic meters per second in July. [1]

Due to the fact that the Zarafshan River flows in turbidity in summer, up to 10-20 tons of silt flows per hectare of irrigated land in the region. The content of phosphorus and potassium in the flowing silt is 1.5-2 times higher than in the Amu Darya and Syrdarya. According to data, there have been about 500 floods in the middle part of the Zarafshan valley over the past hundred years. When floods occur, the water in the streams increases several times (in spring), and the stream overflows. If the average annual water flow of the Tosinsoy is 1.5 m^3 per second, then that of the Kattasoy is 0.268 m^3 per second. But when the flood comes, the Tosin River discharges up to 200 m^3 per second, and the Kattasay even up to 609 m^3 per second. Such a large flow destroys and destroys fields, bridges and roads, and even villages, washes away soil, and creates ravines. In this situation, one of the main tasks is to build ponds and small reservoirs to hold excess spring water and discharge it to fields in the summer. Poultry farming and fishing can be developed in the ponds.

As a practical result of this task, the Kattakurgan reservoir was built in order to rationally use water in the region. The Zarafshan River basin is located on the territory of two countries, namely the republics of Uzbekistan and Tajikistan. The Zarafshan basin can be conditionally divided into two parts:

a) the mountainous part of the basin is located on the territory of the neighboring republic of Tajikistan. The main part of the Zarafshan River flow is formed in this area.

b) the plain part of the basin falls on the territory of Uzbekistan. In the plain part, the Zarafshan River is fed by several streams, the most important of which are the Urgutsoy, Tosunsoy, Oqsoy, Omonqotonsoy, Tasmachisoy and Kattasoy. [2]

The Zarafshan River transits its water resources through its own rivers and canals and, on the basis of requests, delivers them to canals owned by irrigation systems and provides them for use in 8 reservoirs in the region. One of these canals, the Old Tuyatortar Canal, mainly supplies water to the districts of Jizzakh region. The Mirzapay Canal mainly supplies water to the Bulungur, Jamboy and Payariq districts of Samarkand region. The Darghom Canal mainly supplies water to the southern part of Samarkand region, as well as to the Urgut, Tayloq, Samarkand, Pastdarghom, Nurabad, Kattakurgan districts and the city of Samarkand. The Old Anhor Canal supplies water to the Pastdarghom, Nurabad districts of Samarkand region, and the Chiroqchi, Kamashi and Shahrisabz districts of Kashkadarya region.

Karadarya – mainly supplies water to the Akdarya, Jamboy, Ishtikhan, Payariq, Samarkand and Qushrobod districts of Samarkand region. Miyonqol Canal - mainly supplies water to the Khatirchi, Ishtikhan and Kattakurgan districts of Samarkand region. Narpay Canal - mainly supplies water to the Narpay, Pakhtachi, Nurabad, Kattakurgan districts of Samarkand region and the city of Navoi in Navoi region. Karmana-Konimekh Canal - mainly supplies water to the Khatirchi, Navbahor, Konimekh, Kyzyltepa, Nurota districts of Navoi region and the city of Navoi. As we know, in Central Asia, more than 95% of river water is used for irrigation. A number of scientists are engaged in the issues of requirements for the quality of irrigation water.

For example, Kovda (1946), Rabichov (1964), Minashina (1973), Rahimbekov and Ibrohimov (1978), Ramazonov and Rajabov (1980) and others have conducted research on this issue, but this issue has not yet been sufficiently studied. In addition, after the conquest of Turkestan in the second half of the 19th century, the Zarafshan River distribution was important for the economy, so it was scientifically analyzed by L.F. Kostenko, L.N. Sobolev, V.V. Radlov, N.P. Stremauxov and L.N. Logofel. In the 60s-70s of the 20th century, the famous Uzbek scientist A. Muhammadjonov also conducted scientific research. [3]

RESULTS and DISCUSSION. The number of rivers and streams in the Uzbek part of the Zarafshan River basin is 2064. Of these, 1941 are rivers less than 10 km long, accounting for 94% of the total. Navoi region receives drinking and

technical water from the Zarafshan River and partially uses the Amu Darya River. The Amu-Bukhara Canal supplies most of the Kyzyltepa and Karmana districts, namely the Malikchul zone, with water, while the residents of Uchkuduk and Zarafshan cities drink water from the Amu Darya River. A number of positive results have been achieved in the protection and proper use of water resources in the Navoi region. In particular, 45 million m³ of household wastewater was received by Navoiazot OJSC and after biological treatment, 58% of it was used for irrigation of technical crops, 30% for production, and 12% was treated and discharged into the Zarafshan River. [4]

The Lower Zarafshan oasis is currently home to about two million people. Their social life is largely connected with the oasis settings. Therefore, the rational organization and landscape of the Lower Zarafshan oasis require urgent attention. The elimination of such problems as salinization of soils, the shortage of clean drinking water, which are often repeated in the Lower Zarafshan region, the increase in the population, the emergence of new towns, the expansion of irrigated lands show how urgent the problems in the region are at a time when it is difficult for the Zarafshan River water to reach the lands of the Bukhara region. Since the 1950s, systematic and large-scale archaeological research in the ancient irrigated lands of Bukhara has made it possible to identify the historical stages of the development of the Bukhara oasis by the ancient inhabitants of Lower Zarafshan, including the emergence of primitive and irrigated agriculture, the transition to a large-scale irrigation system.

The history of the development of the ancient irrigated lands of Bukhara began at the end of the Stone Age, and the remains of Stone Age hunters and fishermen's villages, periodically discovered as a result of the movement of sand dunes in Vobkent, the ancient delta of the Zarafshan River, covered with portable weapons, microflora and some banks. around them are scattered handmade ceramic vessels. The first chapter of the book "Varakhsha" (1963) began with the lines "Bukhara - a gift from Zarafshan". Archaeologist and orientalist V.A. Shishkin did not call it so for nothing. For thousands of years, according to the scientist, this river has been supplying the local population and enterprises with water. The historical Zarafshan River and its branches play an absolutely incomparable role in the existence of the Lower Zarafshan Oasis. As is known, the water supply of Central Asia comes mainly from mountainous areas.

The Zarafshan River is one of such rivers. The National Encyclopedia of Uzbekistan provides the following material on the etymology of the word Zarafshan, and therefore its origin: Persian “zar”, — meaning gold; “afshon”, — distributor. It appears in the book “Avesta” in the form “Daitya”, “Noble water”. The word “Daitya” was literally translated into Greek during the Greco-Bactrian period and

changed to “Polimet”, “Many noble water”. At other times, the river was also called Sug‘d, Zhirt, Jan, Somjan. In Arabic texts, such names as Wadiy us-Sug'd, Nahr ul-Bukhara - “Holy river” are recorded. In the “Boburnoma” of Zahiriddin Muhammad Babur, it is recorded as Obi Ko‘hak.

Later, from the 18th century, the Ko‘hak river began to be called Zarafshan. The Mastshoh River begins at the Zarafshan Glacier at the junction of the Turkestan, Zarafshan, and Aloy mountain ranges, and begins at the Zarafshan (also known as the Kosuv), which joins the Fandarya on the left and from this point receives the name Zarafshan approximately 189 kilometers downstream. The Zarafshan receives about 4,200 tributaries derived from glaciers and springs. The largest are the Magiyandarya, Fandarya, and Qoshtutdarya. The river and its tributaries have had a great influence on the historical development of the people living in the Zarafshan Valley.

Since ancient times, the valley has been one of the centers of irrigated farming civilizations. It is worth noting that many archaeological studies have been conducted and publications have been created in this direction. Most of them focus on changes in the economic, political, social, and property structures in the region as the main causes of the problems facing the old agricultural regions. It was in the second half of the 19th century that the political and economic environment of Central Asia changed, namely, as a result of the Russian invasion (1868), the upper reaches of the Zarafshan River passed to the Russian state, which caused problems in agriculture in these regions. Therefore, these elements led to the "sandstorm" disaster, which had terrible consequences in Bukhara. [5]

Its tributaries Konimekh, Echkilisoy, Daryosoy, Mokhondaryo, Kuyimozar, Vobkentdaryo, Gurdush, Toykir and other rivers, where cities developed and flourished during the ancient Zarafshan swampy period. The ancient Bukhara people established rich oases and irrigated agriculture in these areas. The ancient and always virgin oases of the Zarafshan Valley include the Bukhara and Karakul oases. For thousands of years, their history, business and social life have been connected with the Zarafshan River in the valley. Of course, knowledge of the geographical location, borders, relief, geological and hydrological evolution history of the Zarafshan Valley helps scientists today to analyze the development and potential of oases, and to design their future directions. Preservation and rational use of the landscapes of the Lower Zarafshan oasis, which are a unique part of the natural world, for the benefit of humanity, is one of the most urgent issues of today. Oasis landscapes are the main source of ensuring the material and spiritual needs of humanity.

Man thus uses nature for various purposes and has had both beneficial and negative effects on it from the moment of its emergence to the present day. Directly at the regional and global levels, with the increase in the population, the expansion

of industrial enterprises, the development of science and technology, human economic activity is gradually changing the level of impact on nature. This complex system consists of a set of measures aimed at preserving nature for the benefit of mankind for present and future generations, its conscious and purposeful transformation, the processing of unsuitable lands, the rational use of natural resources, the prevention of pollution of atmospheric air, groundwater and surface waters, the restoration of the ecological balance of the environment, the prevention of damage by agricultural crops and agricultural products, and the increase in their productivity. Nitrates, pesticides and herbicides, optimization of the degradation process of geosystems and ecosystems, combating soil erosion and salinization in irrigated lands, rational use of geosystems taking into account the laws of nature.

As a result of studying the morphological structure, ecological state of the Lower Zarafshan oasis, their mapping, optimization and protection, and practical solutions developed in this regard, the following conclusions are drawn: In natural geological terms, the Lower Zarafshan oasis includes the Bukhara and Karakul oases; these are the “gift of Zarafshan”. The geographical conditions of the region have always had a great influence on the existence of the landscapes of the Lower Zarafshan oasis; therefore, it is necessary to consider the life of the Bukhara and Karakul oases, the people living in them. The landscape of the Lower Zarafshan oasis has a dry (arid) environment, air temperature and humidity change between seasons. In summer, unusually high temperatures – 460 – create conditions for strong, dusty winds. [6]

The internal waters of the oasis come from outside, so it is very necessary to develop water-saving technologies there. Geographically, the oasis develops in orographically low areas, in river deltas, and their soil is easily saline. Protecting the soil from contamination with pesticides, herbicides and other chemicals, developing its mechanism, and prohibiting the use of harmful substances in excess of the norm on cultivated areas are a necessary condition for the cultivation of environmentally friendly agricultural products in the oasis geosystem that do not pose a threat to human health.

CONCLUSION. Every person living on Earth, including the inhabitants of the Lower Zarafshan oasis, is currently living in a period of intensifying and intensifying ecological disaster. The protection of the landscapes of the Lower Zarafshan oasis, the development of a scientifically based program of measures, the organization and management of a mechanism for their consistent implementation in practice are of great positive importance in increasing the productivity of irrigated agrogeocomplexes. However, the intensification of negative processes leading to a decrease in the productivity of irrigated agrogeocomplexes requires the rational

organization of the use of such geocomplexes in the production of agricultural products on a scientific basis, the identification and implementation of measures to protect land and water resources that are both environmentally and economically efficient. Nature conservation and land reclamation work aimed at the productive use of nature have a very significant impact on irrigated areas, phytoreclamation helps protect agrolandscapes from such harmful phenomena.

REFERENCES

1. Ashurov T. Development of irrigation systems. – Tashkent: "Sharq" publishing house, 2009. p. 112.
2. Habibullayev I. Irrigation technologies and their development. – Tashkent: "Science and Development" publishing house, 2002. p. 78.
3. Sodiqov D. History of the Zarafshon River. – Tashkent: "Science" publishing house, 2001. p. 119.
4. Turaqulov B. Irrigation networks and their management. – Samarkand: "Universitet" publishing house, 2012. p. 98.
5. Tursunov Q. Socio-economic development of the Zarafshon oasis. – Tashkent: "Science and Development" publishing house, 2006. p. 83.
6. Umarov A. Water distribution in irrigation systems. – Tashkent: "Science" publishing house, 2004. p. 70.