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# History of Irrigation in the Fergana Valley

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**Annotation:** This article highlights the rich history of irrigation and irrigation in the beautiful Fergana Valley in the snow-capped mountains, as well as interesting historical facts in its study. You can also learn about the findings and conclusions of the leading researchers of their time, as well as a brief description of the ancient irrigation structures.

**Keywords:** Irrigation, Liman method, Panjaatan (fan-like) method, nevillerovka, sepoya, tanob, labgardon, wooden molds, evolution.

## I. INTRODUCTION

The purpose of studying the history of irrigation in the Fergana Valley is to study the origins of irrigation, as well as the origins of the ancient problems of irrigation, its consequences, and to learn many lessons from it. Therefore, research in this area is constantly being conducted. And those who study this field study it from the time when people began to move from primitive and nomadic life to settlement. The period of settlement coincided with different times in different regions. In the Fergana Valley, we can see from the strata and finds that it dates back to 3-2 thousand years BC.

## II. MAIN PART

In fact, the Fergana Valley has been and still is a country with many natural advantages over other parts of Central Asia. The climate here is characterized by the presence of the best fertile soils in terms of water content, which has ensured the sustainable development of irrigated agriculture since ancient times. Zahiriddin Muhammad Babur describes the nature of his homeland with pleasure: "Fergana region is the fifth climate in the country ... it is a short region. The grain and the fruit are plentiful"<sup>1</sup> reflects the tariff of Fergana at that time. There are almost no written sources describing the history of Fergana before the Arab conquest. "W. W. Barthold was referring to written sources, concluding that there was no information about the period of the emergence of the Fergana peasant culture"<sup>2</sup>. Therefore, archeology is the main focus of the study of the ancient history of irrigation and agriculture in Fergana. Only the archeological researches of B.A. Latinin in 1933-1934 and his work on the ancient irrigation of eastern Fergana can be shown in this field. Archaeological observations on the construction of the Greater Fergana Canal in 1939, AN Bernshtam's Pamir-Tianshan and Pamir-Fergana expeditions, and archeological excavations in Kuva by an archeological team led by YG Gulyamov revealed the Bronze and Iron Ages of the Fergana Valley, especially its eastern part. From the 2nd millennium BC to the 8th century BC and the first period of pre-feudalism, a large number of materials were collected. Many years of scientific research into the history of irrigation have revealed that the first primitive farming was the Liman method. In this method of farming, people used "LIMAN" lands, ie lands where rivers and streams flow into the plains and lowlands.<sup>3</sup> In summary, the history of irrigation in ancient Fergana can be divided into three stages, summarizing the materials of B. Latinin's archeological excavations in eastern Fergana and comparing them with the results of subsequent excavations.

- 1) In Phase 1, small oases for the first time appear in the swampy estuaries of small rivers and in the foothills of temporary mountain streams, which dry up in the spring and then dry up, irrigated by the simplest "liman" method. This stage covers the end of the 2nd millennium BC and the first half of the 1st millennium.
- 2) In Phase 2, small irrigation systems will emerge. However, the "port" method of irrigation was not completely eliminated. During floods, small streams are formed as a result of the gradual clearing of natural tributaries from rivers and their use for irrigation. This stage covers the period from the second half of the 1st millennium BC to the 4th-5th centuries AD. This was the period when the first system of slavery was developing in Fergana.
- 3) In Phase 3, new lands will be developed by digging a formal canal and developing a "fanjagan" (fan-like) irrigation system typical of the Fergana Valley. Thus, a system of organizing artificial irrigation, combining all previous experiments and providing a single goal, begins to take shape.<sup>4</sup>

<sup>1</sup> Бобирнома. УзССР ФА нашриёти (илмий нашр)

<sup>2</sup> В.В Бартолд. К истории орошения Туркестана, -Т.: III, В, 57-67.

<sup>3</sup> Y. G'ulomov. Xorazimning sug'orilish tarixi

<sup>4</sup> Б Латинин. Вопросы ирригации древней Ферганы, -Т.: 1995. стр 9-18

As a result, the construction of ordinary dams, the cleaning of existing canals, and the distribution of water have become the direct responsibility of the central government. The development of valley farming since the early Middle Ages has been marked by the emergence of large and small towns, well-organized irrigation, and the establishment of many settled agricultural villages in the valleys of rivers and streams. Later, in the Fergana Valley, during the period of mass settlement of nomads, ie in the XVII-XVIII centuries, the peculiarity of irrigation was that the rivers of the surrounding small mountain rivers were used instead of the large rivers Naryn and Kara. Each tribe of the settling peoples tried to build an irrigation network to the best of its ability, digging independently by the power of each particular community to meet only the needs of that community (tribe).

Thus, from the 19th century onwards, irrigation and farming developed significantly in the eastern regions of the Fergana region. The largest irrigation facilities also appeared here. The eastern part of the valley is developing faster than the south-western part in terms of irrigation. It is noteworthy in the history of irrigation in the Fergana region that the measures taken for irrigation did not stop under any circumstances, even in the last years of the Kokand Khanate. "The fact that the irrigation work continues uninterrupted is extremely exemplary"<sup>5</sup>, wrote PP Ivanov. All this indicates the development of feudal social relations in the Fergana Valley in the XIX century. The success of the Khanate is honestly described by many Russian tourists. That is „ The irrigation works dug during the khanate were carried out at the expense of the very hard and ruthless exploitation of the working peasant masses. The people also worked hard to keep the buildings in working order. All work was done by hashar without any payment, but the people themselves could not enjoy it. It was not a small task for the khan to dig a canal, but to use the innumerable lands that had previously dried up. ”<sup>6</sup> - writes V. Nalivkin.

The khan made a lot of money by selling irrigated land.<sup>7</sup> After the canal was dug and a new plot of land was irrigated, these lands and the right to irrigate were sold by the khan. Such amassing of land and water was especially successful during the reign of Khudoyorkhan. In particular, the canals dug under the leadership of the Muslims and the Ulugnor canal were built at the expense of a very difficult part of the working people. The following example is typical here. During his exile in Yekaterinburg, his Muslim son, Abdurahmon Oftobachi, wrote a letter to the Governor-General of Turkestan in 1879, demanding the right to inherit the canals his father had built. When the governor-general of Andijan uyezd was instructed to collect information on how much the Muslim had spent on the canal, the village elders in the valley discussed that the Muslim had spent almost nothing on the canal. They will make a unanimous decision on it. ”<sup>8</sup> It is clear that the ruling class used the needs of the common people for its own ends.

In the Fergana Valley, there have been a variety of reasonable procedures, from the construction of dams and canals to the construction of dams and the distribution of water through small canals, to the efficient use of water and irrigation methods. A. Middendorf wrote this after getting acquainted with the irrigation of the valley. "First of all, we have to make disciples in places that are rich in the achievements of thousands of years of experience."<sup>9</sup>

V. I Kushelevsky, a Russian expert who lived in Fergana for a long time, described his impressions of the valley's irrigation as follows: In folk experiments, there were different methods of leveling.<sup>10</sup>

For example: A. Middendorf wrote the following information from people about the construction of the Ulugnor canal. „ A man lies on his back with his head in the direction of the flow of water along a designated canal route. By marking the ground as far as the eye can see, a small ditch will be dug up to that point, so that the next canal route will be built gradually. ” According to A. Middendorf, although this may seem very simple, this method of leveling is not without meaning when the state of the activity of the muscles that move the eyeball in the back is physiologically examined.<sup>11</sup> In addition, there were many methods of leveling in the Fergana Valley. It also required a lot of effort and money to regulate the rivers, canals and irrigation systems. All of this power and expense would be borne by all the rural communities that use the water. The weight of the work depended on the amount of water flowing into the river. In some years, 10 tanobs (400 m<sup>2</sup>) of irrigated land require one worker per day, up to 30 tanobs per worker for two days, and more than two tanobs for the entire working season. Sometimes (less water in the river, less work) one person is asked for 40 tanobs of land. Materials for the sepoys and dams were commonly collected from the villages. The average cost of two sepoys from a village was at least 6 long stalks, 4 carts of horns, and 1 cart of straw.<sup>12</sup>

<sup>5</sup> П.П Иванов. Очерки по истории Средней Азии, -М.: 1958. Стр 182.

<sup>6</sup> В.Наливкин. Краткая история Кокандского ханства. Казань, 1886, стр 29.

<sup>7</sup> П.П Иванов. Курсатилган асар, В-192.

<sup>8</sup> С Жалилов. History of irrigation in the fergana valley. (Фаргона водийсининг сугорилиш тарихи). ФАН нашриёти, -Т.: 1997, Б, 48-49.

<sup>9</sup> А Миддендорф. Очерки Ферганской долины, стр 189.

<sup>10</sup> С Жалилов. Show n work. В-49

<sup>11</sup> А Миддендорф. Show n work, В-181.

<sup>12</sup> С Жалилов. Show n work. В-52.

Water distribution: After the distribution of a certain amount of water in Andijan, Shahrihansay and others, a special person was appointed at the beginning of the dam to control the flow of water by the mirabs of stakeholders, and a large rock was thrown to the shore 20.30 meters below the dam. If the water burying the stone is considered to be more than the intended amount and is reduced, then if the surface of the stone is not buried in the water and dries up, then the water is less than the target, then the water is immediately increased. At certain times, the rock shifted according to the growing season. Drainage from the river and central canals For irrigation, the canals were rigidly measured, ie wooden molds were installed at the head of the canals, and the water flowed along the diameters of these canals. Another method of water distribution is through a "labgardon" (a dam that blocks the waterway and creates a pond where the required amount of water passes through the labgardon, and a pond is formed in the dam area) and water is distributed to adjacent canals based on measurements.<sup>13</sup>

Middendorf Expedition: Academician Alexander Feodorovich Middendorf was instrumental in the first thorough study of Fergana and its study of agriculture and irrigation. He also explored the southern parts of Western Europe and compared many of his characteristics in the experiments of Fergana. In the spring of 1878, A.F. Middendorf toured the Fergana Valley for three months. The results of the expedition and the results of the study of the economy and agriculture of the natural conditions of the valley will be published as a separate work after 4 years. In short, AF Middendorf writes about the nature and climatic conditions of the Fergana Valley with great enthusiasm. He also appreciates the farming experience of Fergana residents. He writes that the recent discoveries of agricultural science were already known in the experience of the Fergana people. In his work, A. Middendorf correctly explains that all the success of agriculture in Fergana depends on the state of irrigation in the issue of artificial irrigation. "Here, humanity has subjugated water since infancy, preventing it from creating a large current as much as possible, but trying to distribute it evenly," he said, exaggerating some of the facts.<sup>14</sup>

- The lifeblood of the Fergana Valley is the Greater Fergana Canal.

The Greater Fergana Canal (full name: Greater Fergana Canal named after Usmon Yusupov) is one of the largest hydraulic structures in the Fergana Valley. It passes through Uzbekistan (283 km), Tajikistan (62 km) and Kyrgyzstan (13 km). It crosses the valley from northeast to southwest. The length of the main river is 350 km. During the growing season, the rivers Naryn (420 m<sup>3</sup> / s), Qoradarya (100 m<sup>3</sup> / s), Sokh (12 m<sup>3</sup> / s) receive 532 m<sup>3</sup> / s. The canal route consists of 2 tracts. The Upper Naryn tract (44 km) starts from the Naryn river (near Uchkurgan) and reaches Kuyganyor. The Lower Karadarya tract (301 km) stretches from the Kuyganyor dam on the Karadarya River, almost parallel to the Syrdarya, to the south near the city of Khojand in the Republic of Tajikistan (below the Qairoqqum Reservoir). In August 1939, it was built and completed in a very short time (45 days) with the People's Hashar. In 1940, it was extended again in Tajikistan (capacity 150 m<sup>3</sup> / s). 160,000 people took part in the construction of the canal. 17.8 million m<sup>3</sup> of soil was excavated on the 270 km route (of which only 1.7 million m<sup>3</sup> was excavated using machinery). 14 excavators, 245 tractors, 420 trucks, 42.2 thousand m<sup>3</sup> of concrete works were used on the difficult sections. 45 large and 275 small hydraulic structures were built. The canal was reconstructed in 1953-62, 1964 and 1967. The length is 345 km, water consumption is 180 m<sup>3</sup> / s, the most intensive water consumption is 211 m<sup>3</sup> / s. In Uzbekistan, Kyrgyzstan, and Tajikistan, the water supply of 500,000 hectares of irrigated land has improved, and new lands can be developed. More than 1,000 hydraulic structures (50 of them are large) have been built in the canal, including 9 dams, 258 water outlets with a maximum total water intake of 162 m<sup>3</sup> / s, 7 discharges and 8 aqueducts. 101 bridges have been built across the canal. Collectors were installed on the left side of the canal to discharge drainage water from floods, discharges and irrigated areas, and drainage water on the right side was connected to the collector through 170 ducers under the canal. Not only is the canal the largest man-made canal in the world, but it is unique in that it was excavated in a very short period of 45 days.

### III. CONCLUSION

In conclusion, it can be said that human beings naturally aspired to live well as a result of evolution. The use of nature was important for this. We can see this in the case of Fergana, especially in the case of water. It is not in vain that water is described as the root of life. In the Fergana Valley, water has been important since ancient times, and we have learned from the above that water is a symbol of power. Thus, we see that people have been trying to control water for a long time and use it for their own needs, and a lot of research and creative work has been done along the way. So, in conclusion, we can say that water and irrigation have always been and continue to be an integral part of life.<sup>15</sup>

<sup>13</sup> С Жалилов. Shown work. В, 56-57.

<sup>14</sup> А Миддендорф. Очерки Ферганской долины, стр 194

<sup>15</sup> [Uz.m.wikipedia.org Katta Fergana channel](http://Uz.m.wikipedia.org/Katta_Fergana_channel).



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