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PECULIARITIES OF THE IRRIGATION SYSTEM IN THE SURKHAN OASIS DURING THE RULE OF THE BUKHARA EMIRATE

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ОСОБЕННОСТИ ИРРИГАЦИОННОЙ СИСТЕМЫ В СУРХАНСКОМ ОАЗИСЕ В ГОДЫ ПРАВЛЕНИЯ БУХАРСКОГО ЭМИРАТА

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Abstract. In this article, the reforms implemented in the irrigation system of the Surkhan oasis during the rule of the Bukhara Emirate and its results are researched based on archival documents, sources and scientific literature.

Аннотация. Исследуются реформы, проведенные в ирригационной системе Сурханского оазиса в годы правления Бухарского эмирата, и их результаты со ссылкой на источники архивных документов и научной литературы.

Keywords: Kosh puli, Topalang, Sangardak, Khojaipok, Sheroboddaryo, Sarijoi, sepo, Makedon bridge.

Ключевые слова: Куш пули, Тупалаланг, Сангардак, Хожаипок, Шерабаддарья, Сарижой, сепоя, Македонский мост.

The development of agriculture in Central Asian khanates depended on artificial irrigation networks. For this reason, special attention is paid to improving the operation of irrigation systems in Bukhara Emirate. This issue was given great importance during the reign of the Mangites, especially during the reign of Amir Shahmurad. Kazan-ariq in Urgut district, Tuman-ariq in Shiraz district, and Togiz-ariq in Surgut district, which were excavated during his time, are examples [1].

The activities carried out in the irrigation system are carried out in two ways: the first is by the state, especially local authorities, and the second is by investors [2]. Also, a special tax supplement (2 coins per double land) was introduced to improve the irrigation system [3].

It is known that the main water artery of Central Asia is Amudarya. Located on the banks of this large river, Surkhan oasis is surrounded by mountain ranges on three sides, and many rivers flow from these ranges. According to water supply, the oasis can be divided into 2 zones — northern and southern zones. The rivers in the northern zone are muddy and mainly include Topalang, Sangardak, Khojaipok, etc. [4].

Surkhandarya, the largest and longest river in the oasis, is one of the main branches of Amudarya, and it was used to irrigate part of the lands of Hisar, Denov, Boysun, and Sherabad districts [5]. Its length is 196 km, the width of its bed is from 80 to 600 meters, the depth is 0.5-1.5 meters, the average speed is 3 m/sec. constitutes Surkhandarya is divided into upper (mountainous) and lower (plain) parts according to the state of the flow. The characteristic feature of the first part is the height of the river bank, the riverbed is full of stones, and the narrowness of the valley. The water regime of Surkhandarya is unfavorable for agriculture. This is evidenced by the fact that

65.6% of the stream flows in May-June, and only 12.4% in July-September [6]. In addition, the abundance of sand in the water taken from Surkhandarya requires annual cleaning of ditches [7]. Nevertheless, the river water was used effectively in agriculture. 5 ditches received water from the right side of the river, and 14 ditches from the left side [8].

Topalang river is the most shallow tributary of Surkhandarya, its length is 111.8 km. In this river, the maximum flow occurs in May, after which the water consumption gradually decreases. The water regime in the river is unfavorable for agriculture. Despite this, 7 streams were taken and used for agriculture. G. Bonvalot gives the following description of the Topalang river: “Topalang is a river called by the name of a vagrant, which wants to overflow unexpectedly and rushes through the empty plain” [9].

Among the important tributaries of Surkhandarya, the length of the Sangardak river is 98 km, 13 streams receive water from it, and 10 streams receive water from the 87.9 km long Khojaipok river, which is fed by the snows of the Koshtang and Chol Boir mountains. In the agriculture of the southern and southwestern part of the oasis, the water of Sherobodarya is used. The length of the river is 171.1 km. and it starts from Chakchak peak of Boysun Mountain. The river gives water to 11 ditches on the right side and 13 ditches on the left side along its course [10]. The minimum water consumption of the river corresponds to the end of spring. In the months of July and August, water decreased, causing serious difficulties in irrigation. It is known that the history of the irrigation system, ancient canals, water structures, construction of dams and other processes related to irrigation goes back to the distant past. “Avesta” also mentions that the irrigation system has been widely used in agriculture of the Surkhan oasis since ancient times [11].

The oldest canal in Northern Bactria is Bandikhon, whose appearance, according to academician E.V. Rtveladze, dates back to the period of Kuchuk I [11]. According to the Greek historian Herodotus, reservoirs, river dams, canals and canals were dug in Bactria even 2,500 years ago. Today, traces of some of those old reservoirs have been preserved. An example of this is Non Dahana, located approximately 10 km north of Sherabad [12].

In general, there are many overflowing rivers in the Surkhan oasis, but it is extremely difficult to control them. Farmers tried to solve this problem for centuries and used different methods. Sepoys are one of the most used methods of blocking river waterways. Although the sepoys is a very simple irrigation construction, it was important in regulating the flow of water. Sepoys were widely used as hydraulic devices in Fergana and Tashkent regions. It was rarely used in the Zarafshan Valley, and almost never in Khorezm [13].

Sepoys were also used in the irrigation system in the Surkhan oasis. Sepoys are mainly made of three pieces of wood, which are knocked into the ground to form a dam as far as possible and fastened together. After that, it is strengthened by throwing wood, stones, and branches around it, this method was mainly used in large ditches. More complex sepoys were used to control rivers and prevent floods [14].

To prepare such a sepoys, the diameter is 20-30 cm. 4-6 meters long hari is taken, three parts of them are tightly tied, then the lower side is left about 1.5 meters and strengthened with small pieces of wood. After that, a special net was built around the sepoys with the help of checkerboard-shaped wood, and when it was lowered into the water, it was strengthened by placing heavy objects such as grass and stones, and in this way, the sepoys was introduced to the bottom of the water. The sepoys were lowered into the water one by one, and after the first process was completed, they were blocked with branches, grass, and other objects, and the waterway was blocked. 10-15 sepoys were used to pump water from Surkhandarya, which is about 60-70 meters wide, to Yangiarik [15].

When the water level rose to 3 meters, water came out into the ditch. In the Surkhan oasis, the water from the river first flowed into a large ditch, and the water flowing from it flowed through the

trees to the ditches, to the water branches in the ditches, then to the arrow ditches, and then to the furrows planted with crops and to the beshamays (watering of five furrows combined into one) in the fields planted with cotton and grain [16].

In the Fergana valley, the first water network separated from the rivers and streams is called “Ena arik”, from which a branch was taken, and water from this brook was supplied to the branches. From them, the arrows spread to the furrows through ditches [17]. Usually, one stream supplied water to one village, so it was mostly named after the tribe, clan, generation or community in that village. For example, a large stream was named Yangariq after the village of Yangariq, the guardian of Boisun reserve. So, in terms of irrigation system, many irrigation measures have been carried out by oasis mirobs who have a lot of experience. For example, Sarijoi stream located on the bank of Topalang Darya took water from Sangardak Darya and crossed the gorge from Sanjirilonsoy, Elbayonsoy, Oqqapchigaysoy and Bandikhon streams from the high right bank of Surkhan through the narrow desert between the mountain and the river. The height of the suspension pipe is 6 sargins, its length is 53 sargins upwards, and the device consisting of a wall that falls vertically into the gorge has been preserved. An 8-gauge window is placed in the wall for water drainage, and it is covered with an arched arch [19].

Another such hydrotechnical construction is the Ravatak ditch, which has been used to irrigate the eastern regions of Sherabad. It was transported by a wooden raft at a height of 2-3 sargens from the river [20]. The residents of Gilambob and nomadic villages used to cultivate crops through this ditch. Especially the melon grown here is famous throughout the emirate and was even taken to the city of Bukhara [21].

One of the famous water structures is a structure built during the reign of Abdullah Khan II on the road connecting Termez with the southern regions of the oasis, Chaganiyan and Hisar, and popularly known as Brick Bridge, Toshko Bridge, and Makedon Bridge. This structure is not only a bridge, but also an aqueduct over which water passes. It is 25x25x5 on Bandikhonsay; It is a girder bridge made of 26-28x4-4, 5; 27-29x5 cm baked bricks, the lower part is made of water-resistant building compound, and the upper part is made of ganchhok. The total length of Bandikhonsoy bridge is 108 m, width is 5 m, the volume of the single arch is 8.5 m. In the upper part of the bridge, the length of the brick channel is 62 m and the width is 1.75 cm. Through it, the water of the Sangardak river was transported to the Kumkurgan steppe and Jarkurgan surroundings [22].

Maintenance of irrigation networks, considered the main factor of agricultural development, was considered a state-wide task. It was necessary to dig and clean all irrigation facilities every year [23]. In the past, this extremely difficult and laborious task was entrusted to the working masses. Mirobs were engaged in water management. The status of a person working in the position of chief mirab in the palace of the emir was high. The chief mirab served as a state adviser in all three khanates and was part of the ruling circle [24]. In the 18th century, the irrigation system in the Bukhara Khanate was controlled by the father. As written in the work “Majma Al-Arkam”, in addition to fatherhood, there were positions of mirab, aminib and arbab [25].

In the 19th century, the water management of the Bukhara Khanate was managed by the Mirobi of the Shokhrud Canal. He must have the title of mirokhor or toksaba [26]. Since the governorship was a high office, it was also the season of his election. In the Surkhan oasis, this event was held at the end of December and the beginning of January, before the digging of ditches began in the winter [27]. The order of watering and its amount was determined by the mirobes. For their service, a water mill or tanoba, collected twice a year in spring and autumn, were given 500 coins and income from a village [28]. There is a special myrobona tax in the Emirate of Bukhara, which amounted to 1,190,000 rubles per Emirate [29].

Generally, most of the irrigated lands strictly adhered to the rotation of water when the crops needed water, when water was scarce, and water was often distributed by check. First of all, water was supplied to the lands at the foot of the ditch, then to the second section from the end of the ditch, and then further up. Water is also distributed to small streams in turn. Farmers patiently waited for their turn, and those who violated the order of water use were severely punished, deprived of water, paid fines, and even imprisoned [30].

The amount of water is measured in a certain order. For example, “one water” (water that flowed from a ditch for a day and night), “one mill” or “stone” (water that goes until a hail of grain is weighed in a mill), “one double” (one pair of oxen to irrigate the plowed land in one day water) and measurements such as “one ear” were widely used. In the water-scarce areas of the oasis, the water supplied to one double plot of land is measured by “moundi” in the paykals used by the community. It consists of a simple earthen jug with a hole in the bottom, which can hold about ten cubic meters of water, and the farmers measured the water when the water in it ran out [31].

In Nurota, one kuvshin of water flowed for one hour, and its price was from 1000 to 1500 coins in Bukhara silver [32].

So, the artificial irrigation system has been formed in the oasis since ancient times, and simple irrigation methods were used until new irrigation facilities were created and even after that. Irrigation work, of course, required a lot of effort and labor. Despite this, the farmers patiently approached their work and tried to get the best possible harvest.

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