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Ethnographic Analysis of Water Networks Development in SURKHAN Oasis

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ABSTRACT: The article provides information on the formation and development of the Surkhan oasis irrigation systems from ancient times to today. Construction of hydroelectric power plants in our country, irrigation of sown areas and the role of Amudarya, Surkhandarya, Sherabaddarya are discussed in the article.

KEYWORDS: water, river, water reservoir, water structure, province, area, farming, population, town, city, stream, ditch, underground canal, sardoba (high rise reservoir).

I. INTRODUCTION

The role of water is significant in discovering new lands and turning deserts into gardens along with for the prosperity of the Surkhan Oasis.

Indeed, water plays a special role in the natural resources, because it is the main source of life of all living things. Life is impossible without water. Our ancestors paid special attention to keeping the water clean and to use it wisely. That is why they did say that "The land is lost as soon as water is over", "struggle for water means struggle for life."

The history of irrigation of the southern Surkhan oasis lies in the long history. If we refer to "Avesto", the sacred book of Zoroastrianism, which was created in the VIII-VII centuries BC, we find in Central Asia more detailed information about natural resources such as: agriculture, cotton growing, grain growing and other agricultural industries. It also provides necessary information on the geographical background of Central Asia, cities, irrigated oasis, and all its material and spiritual wealth [1].

This sacred source indicates that our ancestors used to think of their sources of life from water. They knew well that the irrigation facilities could be well preserved, thanks to the self-sacrificing efforts of hundreds of thousands of people. Therefore, they took measures to preserve the structures.

II. MATERIAL AND METHODS

Written sources discovered during archaeological excavations in Surkhandarya indicate that many constructions were built in Bactria (now Kashkadarya, Surkhandarya, territory of Tajikistan near Amudarya), as well as widespread irrigation and craftsmanship. This is what we can learn from the tracks found in the Bandikhan and Kiziltepa towns and settlements in the VI-IV centuries BC. By means of these rivers and ditches, it is obvious that the current population is drawn to large crops, engaged in agriculture and cultivation.

More about this is found in the following sentences of the Greek historian Curius Ruw, who lived in the middle of the 1st century BC: "Bactria's nature is rich and varied. In some areas, there are thick wood, vine branches have sweet-sugar fruits. Cultivated lands are watered with plenty of springs. The remaining soft land is for crops and the rest for the pasture. Fertile farmland is a place where people live. The capital of the province Bactria is located at the foot of Parapamis (Hindukush). Next to its walls, the Bactrian River flows. The city and the region are named after this river ", as well as in the Kurtsi Ruf, Bactria has two regions - Paretaka and Bubakena. The well-known Austrian scientist V. Tomask, who lived in the last century, described the name Paretaka as "the land where the coast is washed by water."



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Archaeologists have argued that, based on scientific sources, the property of Paretaka is situated in the Sherabad valley and its surrounding mountain foothold, "Bubakena includes areas of Bobotog on both sides." [2]

After the death of Alexander the Great, the land of Bactria, including the Surkhan oasis, was in the hands of the Seleucid Empire, and later the Greco-Bactrian Empire, from the end of the IV century BC to the middle of the III century.

The local population of that time laid the foundations for the new towns and cities of the region. In particular, some of the Bandikhan inhabitants of the region, descended into the surrounding area of Jarkurgan, settled in the city of Dalverzintepa, a city of Mirshad. Part of the Sherabad population moved to the Angor area, where Oysaritepa set up villages in Khayrobotepa, whereas the inhabitants of Shurob, Kaptarkhana and Pattakesar, founded the Tarmita (Termez).

Today ceramic objects found in Termez ruins of the Kushan period (I-IV centuries) among ancient findings of the Museum of Archeology and Ethnography at Termiz State University attracts people more. Among these sources are ceramic pipes of varying volumes used to provide water to the population of the city's arch. The ceramic tubes are quite thin and compact, placed in a depth of 2-4 meters below the ground in different sizes.

The ground water is collected through ceramic pipes, which are sealed to one another, into pools or tiles with special stones. Each household owns the water they need, and wisely uses it. It should be noted that there are also two water-holding trenches, the first of which is the rock layers, constructed with high pressure and dug deeply, and sometimes special jugs were used to collect and store water in soft and water-discharged areas.

These jugs are also durable and smooth, with one another tightly closed and densely packed. Such discoveries played an important role in social life of people in the city centre. During this time, the elders in the village community enjoyed considerable influence in the area of existing irrigation facilities, as well as government taxes and other necessary jobs directly under their leadership.

From the second half of the 7th century, a number of dynasties, such as the Arab army, then Tokhiris, Samanids, Karakhanids, Gaznevids, Seljuks, Karakhitans and Khorezms, fought for the throne as a result of political tensions not only in Movarounnahr, but also in Termez and in Tokharistan. It damaged the country's prosperity. The existing water facilities were destroyed. This was especially noticeable during the Mongol invasion of Genghis Khan.

It is well-known from sources available during Amir Temur's great importance to landscaping work in our country. The definition of the description of this era was well-known in Rui Gonzalez Clavijo's diary, who served on August 21-22, 1404 as ambassador to the Kingdom of Castile and Creole Henry Henry III in Amir Temur's palace: "Termez is very wide and populous, there is no external wall and defense fortifications. The surrounding areas are gardens and many rivers cross the city"[4]. From the words above, it is concluded that during the Temurids era, life in our area led to considerable progress. The local population acquired new lands and paid great attention to build ditches and streams.

III. RESULTS

If you consider the territory of Uzbekistan irrigated as a landlocked country, it will be witnessed that during this period, the construction of hydroelectric power plants has gone three phases:

- a) The first stage of development of hydroelectric power plant construction in the region;
- b) the condition of hydroelectric power plants during the occupation of Uzbekistan by Tsarist Russia;
- c) Development of science and technology development and hydroelectric power plant construction [5].

Commenting on the aforementioned three steps, the archaeologist argues that our region was predominant in the 3rd millennium BC. With the population growth, farming will move from mountain slopes to valleys, plains, and need for construction of artificial irrigation facilities. We have seen this in the example of the Surkhan oasis in the area above.

According to archeologist D.D.Bukinich (1969), academician A.Askarov (1970), the method of artificial irrigation in Uzbekistan, especially in its southern regions, was an inundative method, which was widely used in



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mountain foothills. This method of irrigation was well-developed until the 15th century and has played an important role in the socio-economic development of the country. The liman is called the river bank, where it accumulates in the foothills and is called fertile soils. Crops were sown on the slime mud [6]. In the XIV-XV centuries, the population of the Amu Darya delta (the Aral Sea region) cultivated the natural depths and planted wheat. This sowing of wheat is called "kaygun" in the local dialect, that is, the removal of water [7].

The Surkhan oasis contains gray-brown soil, desert sand, dry, saline, pasture and swampy soils. Gray-brown soils are typical of desert soils, covering 75,000 hectares of the oasis, and one-third for irrigation. About 130,000 hectares of Surkhan-Sherabad oasis are desert sandy soils and sand. Desert-sand soils can be converted to irrigated lands according to climatic conditions of the region. The area of this irrigated land is 60,000 hectares. Surkhan-Sherobod oasis occupies 7,000 hectares of pastures [8].

Over the years, irrigation has gradually improved. Various hydroelectric power plants, including arcades, pools and water supply, have played a positive role in expanding farming, creating new populations. Experienced and highly qualified engineers have started to build underground canals, sardobas (highrise reservoir) and reservoirs by exploring their geographical location and their regional characteristics.

The underground canal, which combined dozens of wells in Uzbekistan, was widely used in the territory of Uzbekistan, especially in its southern regions, in more mountain slopes. Its length extends from 0.5 km to several km.

The peoples living in the mountains of the region are well known for their hard work in the field of labor and well-being, as well as farming and gardens. In the villages of Kohitang, Sherabad District, the village of Kohitang was used as a sophisticated method of water withdrawal close to the village of Aktash, Gaz, and Chorbog. Koriz (underground canal) is a stream of wells, i.e. an underground water device. It is known that the first underground canals were dug in the early 19th century. Near the village of Aktash, traces of old underground canals have been preserved.

Village elders say that these soldiers were Alexander Macedonian soldiers. At the time of the excavation, a complex technique such as astrolabia was used. The length of some underground canals has reached 3 km. Wells, sometimes at depth up to 15 meters, could be merged through special corridors. The elaborate elderly residents of the village of Aktash and Gaz today are able to tell about the excavation of the complex underground apparatus and its image and its economic significance. In the above mentioned villages, there were more than 7-8 underground canals.

These were Zindon, Kizilboy, Tol, Kultepa, Yomon and other two small underground canals. Typically, every underground canal had its own name, and its history of toponomy. Zindon (prison) underground canal was given its name for its great depth [9]. The Kizilboy underground canal was called Yakub's underground canal initially. Yakub was a man who dug and digged this underground canal. Later, it was called Kizilboy, a village which drank its water. The peasants did not dig the underground canal wherever they liked. They started this work after learning about the soil condition, water level. The underground canals were dug up from the top of the ground. First of all, the diameter of the underground canal is taken to excavate. Excavation would be gradually harder as they were digging deeper. After that, a device was made that would move and rotate, putting some wood in horizontal and vertical position on the diameter of the underground canal. That was a water lifting device. Then people made basket to lift clay, stone and sand inside the underground canal. The basket was originally made of camel's leather. The rope was made of camels and oxen leather. The horse was used in order to lift the sand and stone inside the underground canal. Excavation was mainly done by hashar (community service). Rituals and ceremonies were held during the excavation process. At first, they would give a donation to the Suleyman ota, pir of water.

Sheep or ox was slaughtered as a donation. And whoever had a donation of charity, he would give this donation in front of the diggers of underground canal, so that many might bless him. Of course, the depth of the diggings and the amount of water were different. The most corrupt among the underground canals was the Zindon underground canal. The depth of this underground canal was about 22-25 meters [10].

The length of the cores was also different. The longest underground canal was the Kizilboy underground canal. Its length was 8 km. The length of Zindon underground canal corridor was 2.5 km, the distance between each of the Zindon underground canal wells was 20, 22, 25 meters, and the diameter was about 4.5 meters. The Kizilboy wells were between 8-10 m and 3-4 m in diameter. Underground canals were of great importance in agriculture of mountain



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villages. Because water of underground canals provided livestock and the population with drinking water as well as crops were watered.

Underground canal water was first directed to water wheat and barley. In addition, people also used underground canal water for irrigation of melons, corn and clover. Trees were watered twice a year during winter and summer. It should be noted that cotton was also sown in the Kohitang mountain villages. During this period, cotton sort "movriguza" was planted. This cotton was planted not as it is today.

The elderly of the Surkhan oasis in the village of Aktash, Goz, can also say what amount of land was watered by underground canals. They say that the Kizilboy water reservoir was mostly used by the residents of Kizilboy village. The village people occupied 12 paykal watered land. 1 paykal was of about 4 or 5 hectares with the present measure. Thus, the area under cultivation of the village of Kizilboy was about 50-60 hectares. Rural population received drinking water one day in a row [11].

In September and October of the year, the waters of underground canal began to increase, and in June it dropped. It was hard to predict the increase and decrease of aquifer of underground canals which was near the ground surface. They were the same in winter and summerties. These include the Kizilboy, Kultepa, Chorbog and Yomon underground canals. Water of Zindon underground canal increased in the autumn, because it was deep in the cistern, it had diminished during the summer months, and the water in the winter came close to the ground surface. The wells of underground canal were cleaned in spring. Some of the wells have been damaged, but are still being used by Kizilboy, Kultepa, Tol underground canals [12].

IV. DISCUSSIONS

Additionally, construction of another important hydrotechnical construction - sardoba was particularly important for the effective use of water resources in desert zones. The sardoba (high-quality brick and hydraulic fluid-filled hydrotechnical construction), designed to effectively use rain water, are designed to protect it from strong sunlight. Although such structures are relatively rare in Surkhandarya region, it is often built on communication lines. Currently, 44 sardobas have been preserved in Uzbekistan, of which 29 are on the main caravan routes. The sardoba were widely used in irrigation of crops.

In the early stages of modern development in the territory of present-day Uzbekistan, the importance of reservoirs was significant. The first reservoirs on the territory of the country were located in the "Khanbandi" (X century, Kizilkum desert) and another water reservoir - "Abdullakhanbandi" (Nurota, Akchab village). Although the size and capacity of the reservoirs were small, they have greatly helped to save the needed water [13].

The second stage of the construction of hydro technical construction on the territory of our country covers the middle of the XIX century and the beginning of the 20th century. This period began in 1853 and covers the period from the invasion of Tsarist Russia in Central Asia to the 1950s. In the early stages of this period, the canals were dug in the Mirzachul, Marv and Termez regions, and the gully-water gutter and water reservoirs were constructed to regulate water distribution. From the socio-economic point of view, the early part of this period can be interpreted as the beginning of an extensive development of agricultural production in the region, the transformation of Uzbekistan into a raw-material space for the Russian Empire, and industrial development as a period of "decay."

In 1910, the Tsarist administration in Termez allowed renting irrigated and non-irrigated lands. And most importantly, the Tsarist government guaranteed water supply for five years with the tenants. However, this "five-year" guarantee was not eternal, because the Termez irrigation system could not meet this demand. The reason for this was the rapid decline of the ditch due to the fact that the water build-up and mud removal were not considered during the new ditch digging. From the canal 18 km away from Termez blurred Surkhan water flowed to the pool 12 miles from Termez. Here, the clay and sand drifted, the water spread through the third network of the same main channel. According to A.G.Ananov, besides the lack of access and cleaning of water collection basins, the Tsarist government did not have the necessary funds to build new reservoirs and natural reservoirs. Although new projects were created in 1911-1914 to implement this irrigation system, it was required to spend half a million rubles to do so. The project and proposals of the military engineer A.G.Ananov were very important for the local population, but the Tsarist



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government was engaged in looting, rather than naturally increasing raw material sources, without paying much attention to it [14].

Through the project of A.G. Ananov, the main objective of the Tsarist Russia in these lands was to:

1. Raising the desert to the steppes by bringing them back to life in the interests of the state, and awakening the sleeping desert covering great treasure;
2. A country would appear where the cotton industry could be established;
3. Termez's army and army's state would improve; they would provide food and labor;
4. An important market for the sale of products produced in Russia would be created, and the Russian market would have over one million pounds of cotton fiber, which in due time will relieve Russia of its dependence on the United States. It would make the price of cotton cheaper;
5. Ensure the construction of a strategically important railway line;
6. The tropical climate would undoubtedly improve. This, in turn, would improve the sanitary condition of the region. At that moment, Termez had a hot breath of the desert, the Russian born in such a natural environment would suffer from typhus, fever, and many other diseases;
7. The vulnerability of the irrigation system could be strengthened, as the system could not withstand the Surkhan water shots, requiring construction of many additional water pools. In addition, state-owned irrigated lands could be raised from 4,000 to 10,000 desyatinas, which served as a treasure trove to enrich the tsarist budget [15].

V. CONCLUSIONS

In the implementation of these projects, it was clear that Tsarist Russia's administrators had the only goal of using the Central Asian land effectively.

The third stage of the construction of hydrotechnical construction in the region's socio-economic development was characterized by a complex of historical buildings. This phase was characterized by the advent of science and technology development in the mid-1950s, with the use of powerful techniques in irrigation.

This period can also be considered a period of "great constructions". During this period, dozens and hundreds of small canals, dozens of large reservoirs were built in our country, in various parts of the country, and a truly revolutionary process was carried out in irrigation. Among the many reservoirs, such as the Surkhan oasis, the Southern Surkhan reservoir (1959-1967), Uchkizil reservoir (1965), Tupalang reservoir (1982), large canals - Khazarabad (1929), Kumkurgan (1932), Zang (1966), Sherobod Main Canal (1971), Amuzang (1973) and Tupalang - Qoratog (1974) canals had been completed.

If in 1965 the total area of irrigated lands was 167.9 thousand hectares, by 2016 this figure reached almost 334 thousand hectares.

In summary, we made an effort to illustrate the development of irrigation constructions along with facilities in Surkhan oasis from ancient times to the present. The construction of hydrotechnical construction on the territory of our country, the irrigation of the cultivated areas, we have considered the role of Amudarya, Surkhandarya, Sherobodarya and other water resources in the economic and social life of our country. Our main task now is to provide timely repairs, to clean the environment from various wastes and to provide generous delivery of generations to all the existing rivers, reservoirs and large canals. Of course, by doing so, we will allow our oasis to become more prosperous.

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