

# HAUZES OF MEDIEVAL BUKHARA - ARTERIES OF LIFE

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**ABSTRACT--***This article is devoted to the history of the development of the water supply system of Central Asian historical cities, using the example of Bukhara and Samarkand. The purpose of this article is to study the system of water tanks and irrigation ditches of medieval Bukhara, to identify its features that contributed to the evolution of simple natural water arteries - irrigation ditches and water reservoirs - houses into the town-planning, landscape infrastructure of the historical city. The article highlights the unique features of the traditional water supply of urban reservoirs - water tank and aryks (ditches) of Samarkand and Bukhara in the period of antiquity and the Middle Ages. The main aspects of the research that formed the basis of this article are how the ancient, original, ten-century-old water supply system of Bukhara and Samarkand was modified under the influence of the development of civilization; the role of clean running water sources - irrigation aryks (ditches) and water tanks in the conditions of the hot arid climate of the ancient cities of Samarkand and Bukhara through the centuries and today; the function and contribution of this water supply system to the development of tourism in the historical center of the aforementioned cities today. In order to study more deeply the issue of introducing water tanks into the architectural composition of medieval ensembles, their contribution to the development of the urban social structure and architecture, we studied the planning features of the medieval architectural monuments of Samarkand and Bukhara that have survived to this day. Thus, a number of features were identified in the architectural, planning and landscape solutions of historical ensembles. Based on a study of the literary sources of ancient Eastern authors and Soviet scholars, a field survey of some ditches and water tanks of Samarkand that have survived to this day, as well as diagrams and maps with designations of aryks and water tanks, forming a single water supply system for Samarkand and Bukhara, several conclusions have been made that meet the set at the beginning of the research questions. According to the findings of the study, the author put forward a number of proposals and recommendations aimed at reviving the original system of water tanks and aryks of Samarkand and Bukhara - as the historical architectural heritage of Uzbekistan.*

**Key words--** *system, water supply, Central Asia, irrigation ditches, houses, Samarkand, Bukhara, quarters, makhalla, guzars, city square, historical, architectural, heritage.*

## I. INTRODUCTION AND PROBLEM STATEMENT

Water in Central Asia, in the conditions of an arid hot climate, has always played a major role in the life of the population. The water supply system of Bukhara was interconnected with the socio-cultural life and architectural and landscape structure of the city. For more than 10 centuries, the houses connected by canals

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(canals) have served as an integral link in the architectural compositions of public centers. “Mosques and minarets were erected around the houses — serving as community centers — Maktaba schools, madrassas, and honakos, not a single teahouse of Guzar residential quarters was complete without houses” (NabiraeV, 2002).

In the XIX-XX centuries issues of traditional water supply to the ancient cities of Central Asia, including Bukhara and Samarkand, were raised and considered in the works of: medieval historians in Arabic—Ibn Hogal and al-Istahri, who conducted significant studies of the water supply system of Bukhara Xv. Then Al Mokadasi, Narshakhi and Mollahzadeh contributed to the study of the primary structure of the Bukhara water supply system of the 20th century; pre-revolutionary, and then Soviet oriental scientists: V. L. Vyatkina, V. V. Bartold, A. O. Sukhareva, I. L. Rempel, V. I. Kochedamova and others. Today, leading scientists of the modern East continue to study this topic. : A. Alikhashemi, M. Faghara, M. Kh. Isametdinov, F. I. Naberaev and others. In addition, it is worth noting a number of publications prepared in Kon. XX - beg. XXI centuries European and American researchers.

## II. RESEARCH METHODOLOGY AND FACTUAL MATERIAL

Formed in accordance with hydraulic situations, the vital system of supplying citizens with clean running water both in ancient times and in the Middle Ages played a multi-purpose role in the urban spatial structure. The constant struggle against water scarcity and the densely populated residential areas of medieval Central Asia led to the inevitable invention and, as a result, to the improvement of one of the most complex water infrastructures in the world in these regions. Large-crowned trees (both decorative and fruit) were always planted around the houses, pursuing several goals:

- Firstly: the shading of the area around the house will ensure minimal evaporation of valuable drinking water, create a pleasant microclimate, which is so necessary in a hot, arid city.
- Secondly: the roots of trees planted perimeter around the shores of the houses served as a natural shore-strengthening structure.
- Thirdly: here, as a result, a certain oasis was formed, a place for public communication of citizens for a pleasant time in between day prayers, a place for fun kids, in the shade of fruit trees. According to the scientist NabiraeV F.I. : “The whole life of the city, in fact, revolved around the house. People who drank water from the houses took care of them, constantly strengthening the banks, lovingly planting trees, carefully cleansed irrigation ditches and passed from generation to generation the offspring of keeping houses and irrigation ditches—“sources of life” (NabiraeV, 2002).

The system of supplying Bukhara’s population with clean running water, through the construction of houses, elevated arteries - irrigation ditches and underground ganats (or Persian “ropes”), carrying their waters from the Zeravshan River, had a vital role in the urban landscape of Bukhara, being an effective integration between the water infrastructure and urban architecture. The medieval water supply system to this day partially exists in the old part of the city, despite the fact that more than 90% of it in its original form has not been preserved to this day (Fig. 1-3).

An integrated and multidimensional water supply system continued to function for 10 centuries from the Sassanid era (Central Asia became part of the Sasanian empire in the first half of the 7th century) to the Timurids (14th-15th centuries), from the Sheibanids (16th-17th centuries) and to the Turkestan General governorships ...

At the beginning of XX century. serious political, economic, religious, socio-cultural, technological changes took place in the region. The centuries-old water supply system has gradually fallen into decay, having lost its relevance. For centuries, houses keeping cool water, creating a special microclimate, have lost their main function - as a source of clean running drinking water; they were partially replaced by a water supply system carried out at the beginning of the 20th century.

The situation changed after the Republic of Uzbekistan gained independence. Already in the 1990s. the systematic restoration of the historical centers of medieval Uzbek cities, the reconstruction and restoration of their architectural monuments began. So, on January 6, 1996, the Cabinet of Ministers of the Republic of Uzbekistan adopted a resolution "On the preparation and celebration of the 2500th anniversary of the city of Bukhara", which marked the beginning of a large-scale revival of the city, based on the decision of the 28th session of the General Assembly held in October-November 1995 in Paris UNESCO conferences.

Thus, the houses returned to the urban environment of Bukhara, albeit in a new role: not sources of drinking water, but objects of cultural heritage. Today they can be viewed as part of a number of historical architectural complexes. I will give an example of the ensembles of Bukhara that exist to this day, which include a house:

1. Lyabi-Hauz complex "(Uzbek. Labi Hovuz, literally. "Coast of a reservoir") (Fig. 1) Architectural ensemble of the 16th-17th centuries. on one of the central squares of Bukhara. Formed by the buildings of the Kukeldash Madrasah, the Divan-Begi Madrasah and the khanaki Divan-Begi. The ensemble is approximately 150 × 200 m in size. The central element of the complex is the Nadir-Divan-Begi house: an extensive pool of 36 × 42 m and a depth of 5 m, built around 1620. The banks of the house have stone steps along which Bukhara water-carriers descended to the water, providing inhabitants of water. Now there is a cafe on its shore, where it is especially pleasant to sit on a hot summer evening, enjoying the cool of the water.

2. Bolo-Hauz complex (Pers. "Children's pond." (Fig.2a)). The architectural ensemble of the beginning. XVII century in the central square (registan) of Bukhara, consisting of a mosque, minaret and house. It is noteworthy that the Bolo-House mosque before the 1917 revolution served as the main Friday mosque in Bukhara, and the Bukhara emir prayed in it.

3. The Khanaka Mosque of Khoja Zaynuddin. (Fig.2b). This ancient monument is hidden from prying eyes in a residential quarter of the historic center. The khanaki building was built in the 16th century, then was used as a quarter mosque. Next to the khanaka is the house, the oldest existing in Bukhara. In the nineteenth century. it was lined with stone slabs.

4. The memorial complex of Khoja Bahouddin Naqshbandi. It is a Muslim shrine, it is often called the Central Asian Mecca. Bahauddin Naqshband himself is known as a great religious figure, mentor of Amir Temur, a Sufi teacher and founder of the most significant Sufi order, who has performed the hajj to Mecca 32 times. Bahauddin Naqshband died in 1389 and was buried near Bukhara, in the town of Kasri Orifon. In the middle of the 16th century, Khan Abd al-Aziz ordered the construction of a crypt over his grave. Two centuries later, a mosque with two aivans and a minaret appeared there, and in the XIX century. Nasrullah Khan's vizier Hakim Kushbegi added another mosque to the complex. In 1993, on the initiative of the first President of the Republic of

Uzbekistan Islam Karimov, the complex was completely restored, the original appearance of tombs, mosques, terraces and madrassas was recreated. Today, the resting place of Bahouddin Naqshbandi is one of the main tourist attractions of Bukhara.

5. The complex Hodge-Gaukushon. One of the largest architectural ensembles in the center of Bukhara. Includes 16th-century Gaukushon madrasah, a cathedral mosque with the 17th-century Khoja Kalon minaret, as well as a madrasah and an octagonal house. The complex got its name by location: Gaukushon means "killing bulls", before construction, there was a large commercial area of Bukhara at this place, and even earlier, a slaughterhouse. Together with a number of other buildings in the central part of the city, the ensemble is included in the UNESCO World Heritage List.

6. Necropolis of Chor-Bakr (Arabic. "Four brothers"). It is located in the suburbs of Bukhara - the village of Sumitan and is a kind of "city of the dead", there are streets, courtyards, gates, but instead of houses everywhere there are family dahms (tombs) and gravestones. In the center of Chor-Bakr there are three main buildings: a mosque, a khanaka and a madrasah. The complex is included in the UNESCO World Heritage List.

Undoubtedly, Uzbekistanis cherish and rightly take pride in the true treasures of their great city. "... who gave the world such names as the historian Narshahi, the poets Rudaki, Dakiki, the physician and mathematician, the encyclopedist Abu Ali ibn Sina (Avicenna), the historian Belazuri, Tabari, Ibn Miskaveih, poets and philosophers Al-Farabi and Omar Khayyam".

Today, in the XXI century, continuing and supplementing the research of V.I. Kochedamov, we can state that the unique water supply system has again become an integral and extremely important element of the historical development of Bukhara, performs the functions of fire reservoirs and creates a favorable microclimate and a special cultural, historical environment, attracting millions of tourists from all over the world. Being the natural core of intra-quarter public centers and city squares, the highlight of mosques and madrassas, the network of irrigation canals and houses has undeniable value as an object of architectural and historical heritage and is subject to further restoration, painstaking and thoughtful reconstruction and careful preservation for future generations.



**Figure 1:** Lyab-i House ensemble in Bukhara

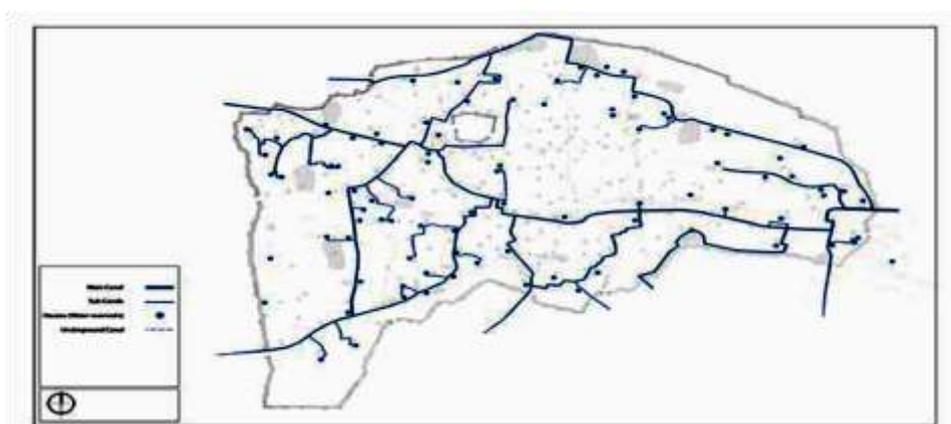
(Source: <https://orientsecrets.uz/ru/dostoprimechatelnosti/ansambl-lyabi-hauz>)

Created in the XVI-XVII centuries formed by the buildings of the Kukeldash madrasah, the Divan-Begi madrasah and the khanaki Divan-Begi, grouped around the reservoir of the house Nadir-Begi.



**Figure 2 :** a) House at the Mosque, Honakoh Khoja Zayniddin;  
b) House at the Bolo House Complex

(Source: <https://rusrav.uz/2018/01/18/mechet-honakoh-hodzha-zajniddin/>)



**Figure 3:** The water supply system of Bukhara at the end of the XIX century. According to the cards presented by Parfenov-Fenin and Kochedamov.

(Source: Aida Alihashemi, 2015)

*The structure of city routes is presented on the map of Parfyonov-Fenin, also taking into account the historical names of places and buildings. Here, a possible structure and direction of the water system of Bukhara Xv was*

proposed. On this map, all the elements that formed the water supply system in those days were located in connection with Rabat, the inner city, city wall, city gates and public ensembles.

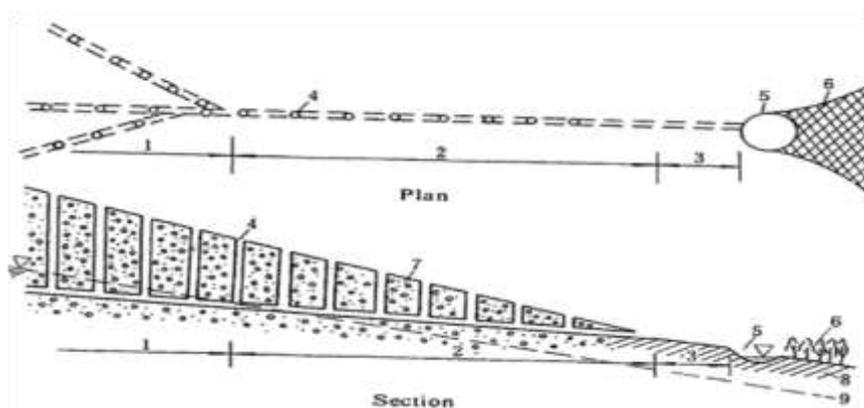


Figure 4: General layout of the “rope” (Qanat). (Source7)

(1) Infiltration part of the tunnel; (2) Water transport part of the tunnel; (3) open channel; (4) Vertical shafts; (5) A small storage pond; (6) Irrigation zone; (7) Sand and gravel; (8) soil layers; (9) Groundwater surface



Figure 5: Map of the spread of Qanat rope technology.

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