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ORIGINAL ARTICLE**The Importance of Water in Iran and its Role in the Formation of Past and Present Architectural Spaces****¹Bahram karami, ²Shahryar Shaghaghi G, ³Behzad Masodi A**¹*Department of Art Architecture, Shabestar Branch, Islamic Azad University, Shabestar, Iran.*²*Ph.D. in urban design, Master in architecture, Department of Art Architecture, Shabestar Branch, Islamic Azad University, Shabestar, Iran.*³*College of Fine Arts, university of Tehran.*

Bahram karami, Shahryar Shaghaghi G, Behzad Masodi A: The Importance of Water in Iran and its Role in the Formation of Past and Present Architectural Spaces

ABSTRACT

At this point of time water can affect our architecture and design as did in past. Perhaps only thing slightly changed is how to use it. Nowadays, different forms of water are used in urban areas. This is probably due to increasing importance of water in human life. Home is a place to relax; its contact with water causes man sees surrounding nature in addition to building delicacies; feels it precisely by stimulating sight, hearing and touching powers. When water is near us, we understand sense of space by its combinations and contradictions with nature. Using reflective properties, depth and infiniteness of large areas of water, designers extend individual privacy and get away repression feeling in closed places from them. Though, there is something on reflection which moves the heart. That is why important buildings should be reflected in the water to give them glory and show them pleasant. Given the importance of water in architecture of Iran and the world including traditional, modern and post-modern architecture, this redemptive liquid plays a very important role in the architecture. Perhaps the most influential quality of water in the architecture is its ductility which is its most understandable one. Emerging water in architecture focuses on the hypothesis that water is central as a key element in architecture, and is not marginal as a sub-element. In this regard, fresh and new activity is always alongside with new generation. Current generation is expected to better understand previous formats; to have new words in a way that meet roots of history and old culture; in fact, to provide ideas and traditions of past along with the content of culture and architecture in new format.

Key words: element of water, water in religious places, water in residential places, water in urban areas, water and its associated elements**Introduction**

The element of water is differently treated in various parts of the world; water is a common element in Europe; however it is a spiritual element in Iran and it has always been a symbol of life and spirituality prior Islam, in Anahita Temple and post Islam in ablution place and Sqakhanehs of mosques. Karami, a 5th A.H. scholar in his "Hidden water" wrote: Element of water has been an unattainable element due to Iranian arid climate; that's why it has material and spiritual values in our architecture. Water is a symbol of vitality and moisture in terms of material as it is clear from Fin Garden in Kashan. It reflects spiritual mode in Saqakhaneh and ablution place of mosques in intellectual terms [1]. Iranian architecture is especially interested in nature (in general sense) and elements of creation (in specific sense) resulting from religion considering

traditionalist nature and specific philosophical-social perspective. Water, air and nature are always flowing within this architecture. Considering that climate of Iranian plateau somehow prevents people from normal access to these elements, creative mind of Iranian architecture flows these elements into space in a certain way. Presence of water in Iranian architecture is clear as a life purifying. Water can be seen as stunning in most Hozkhanehs and fountains of mosques, houses and gardens [2]. Water is considered as a core element in architecture; architecture is placed around it; gives shape and form to spaces; is the interface and binder of different areas to each other; passes through environment as flow and transient. These options may be expressed individually or together in a single environment. However, water is indicator of symbolic features. Availability of water resources has been considered as one of the most important factors in urban

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locating. General geographical investigation of Iranian cities shows the relationship between urban life and availability of water resources. Due to climatic variability and natural environment in many areas away from safe surface-water resources, people needs are met by groundwater sources, such as canals and wells [3,4]. Water supply, reservoirs and distribution systems, especially in low-water areas of Iran, are resulted from employing complex technical and mathematical practices and innovations and providing different methods of measurement, specific examples of which can be observed in dividing water of Zayandehrood by Sheikh Bahai, and dividing muddy water of Rudbar in Semnan recommended by Sheikh Alaa Dawla Semnani. Meanwhile, the location where water is divided represents a beautiful landscape which is noteworthy as a persistent work and a cultural heritage. Water has traditionally played a significant role in the formation and perfection of Iranian cities architecture, especially those located in low-water areas. It does not mean the role of water is less valuable in architecture of water-filled areas or people in those areas neglect spiritual values of water. These can be mixed with new methods as historical experiences and provide new path upon modern man [5]. Iran constantly has been followed by a concept of drought and lack of water. Water has been considered as the main element of vitality in Iranian architecture. Where the contrast between land and water is manifested, attitudes of most Iranian people toward water are different from people in other parts of the world. This different attitude is generating origins and symbolic meanings which always were physically manifested in Iranian architecture. Such as wells of Persian Garden which is a symbol of springs. Life begins from this flushing and movement of water in the soil. Water is low In Iran. Water is the most important factor forming people's living space; locating cities; road network arrangement; sequence of open and closed residential areas; extended movement of aqueducts; all of which are influenced by water. It is clear that symbolic manifestation of water in Iranian architecture is a factor leading thought of architect in creating space which has been always admired by mounting on deep intellectual and spiritual concepts and maintained the life within itself. Today, physical spaces of life is reduced to meet physical needs due to loss of these symbolic manifestations and fundamental concepts in architectural thoughts and designing concepts being empty of space [6].

2. Water in Religious Spaces:

prior Islam, architecture expressed itself beside water alongside the nature without disturbing it; 'water played an abstract role'. Temples (Atashkadehs and the Temple of Anahita) were

formed next to water with respect to the presence of water. Though, water is a path for man to enter the other world; a purer world where body cannot pass through. In the Islamic era, the role of water in the architecture became functional. The architects of this period consciously tried to dominate nature and order it. They tamed water and nature and made it richer by logic and technology of their age. Before Islam, architecture hastened toward water and rest next to it. Later, architects brought water into architecture by understanding the physical laws on behavior of water and understanding its role, allegory and relationship with human. Ordered water is manifested in geometric shapes on most Islamic buildings; somehow, centrality and unity in the architecture are formed on water. Centrality of water in architecture began during the Sassanian era from temple of Azar Gushnasban and Anahita in Bishaboer. In the Islamic era, there is a developed form of water centrality in architecture. Its wavy motion flowed in religious, literary and artistic concepts of our culture [7]. In Islam, water underlies the relationship with God. Prerequisite for entry in many prayers, such as Namaz, is washing as ablution and ghusl. It is also recommended to perform ablution or ghusl for permitted actions. Even having ablution is recommended in all modes. In Iran, a place was traditionally provided for washing inside the temple and out of it where prayer and worshiper can remove demons of himself before he can come to worship. Mosque companion with water oriented toward perfection following spread of Islam. So that in the past its different forms (Patios, sunken garden, pool, reservoir, etc.) became an integral part of religious sites particularly mosques. It is natural that such a religion and culture requires necessity of human's quick and easy access to cleaning resources of water [8].

3. Water in Residential Spaces:

Iran is in arid area in terms of geography and climate; it is always faced with the problem of water shortages and drought. Available old dams, remains of irrigation networks and aqueducts all are examples of people fighting drought and water in our country. Shortage of water and existence of dry deserts caused to special respect for water among Iranian people in ancient times. In our national culture, water is the symbol of light and purity. In not too distant past, there was not a house without a pond. Large and small beautiful pools by turquoise blue tiles were symbol of life in any house. Pool has been very important in Iranian houses. Water of this pool is storage for watering flowers and sprinkling yard and porch. Also people built basin in the basement of houses by creating small pools in different forms where they, in hot summers, rest and converse in its cool desired weather. Residential places and

particularly their yards were a suitable place for man connecting with the natural elements such as water. This connection was made through a variety of ways. One of them was Patio. Patio which was gradually shifted from temples into houses beautified Iranian houses due to the subjectivism of Persian Architecture, conversion of cupped courtyard to patio and sunken garden. Pools in the yards played a significant role with their various forms. Different forms of pools were made in the courtyard and between gardens. About form of ponds Pirnia writes: These ponds were Iranian hexagonal, twelve-sided and rectangular with golden proportions; they were made round in some cities such as Shiraz. Additionally, basins played a remarkable role, especially in desert cities like Kashan in connecting man with water and stylizing natural harsh conditions. Basin is an example of particular house in Kashan which was built along aqueducts that entered cities and traveled through it. As noted in religious spaces, Courtyards are allegorical symbol of heaven which had own effects in Iranian houses. In Boorkhardt words, nature of paradise requires that be covered and mystified because it is consistent with the inner world and mental depths. Similarly, Muslim houses are similar to the spiritual world with a central courtyard surrounded by four rows of trees (gardens) and the water flowing on it.

4. Water in Urban Spaces:

Water as one of the most essential elements has a great impact on the formation of urban spaces. Here, the urban spaces mean public spaces or vast private spaces such as gardens which play proper role in formation of public urban form. One of the most striking systems of using water and it's beautifully display has been in the Persian Gardens which were appeared in irrigation system; movement of water in waterfronts; embedding fountains, waterfalls, ponds. Pirnia writes about coordinates of these elements and designating them: 'While manufacturers have created a system of interest to irrigating plots they have tried to show water in the best way. For this purpose they selected levels so that water flow could be well represented. Step by step path of gentle water, its fast and noisy flow in some parts was one of these methods. Frequently a boulder with white cake cutting and different designs was installed in the palm of fountains mostly in places where water poured to show nice water waves. Waterfront is a series of brooks used to display water and compensate drought of some areas. These brooks were 30 cm in depth and 80 cm in width. There were fountains in waterfront which threw water inside the waterfront. They were usually made of stone. There was usually a square or rectangular pool in front of the main summerhouses of gardens. Round pools were prevalent only pre Islamic and early Islamic

period; they were not used later. Elliptical pools were never built; because according to beliefs water decays faster in elliptical pools than others. Later, pools were built in a regular simple form from six-sided to twelve-sided. Eight-sided pools were generally used. Twelve-sided pools were mostly used in relatively large pools. Eight-sided pools were sometimes built in eight and a half or navicular forms. Pietro de la vale describes Chaharbagh: "there are large pools in different forms and various distances often in front of beautiful houses and full of water, each extended alongside a wide approach to cross people, on foot or in vehicles, and travels in the middle of street to water down the pool. Water jumps through fountain in many of these pools; in others, it cascade like small waterfalls". Chardin wrote about street pools that they are different in terms of size and shape; there are brooks and two rows of plane tree in allies joining to street' [8].

5. Water and Relevant Elements in Past Architecture:

Many architectural elements are exclusively created to preserve, distribute and consume water in which Iranian art present its beautiful, desired and meaningful appearance. These elements include reservoirs, fridges, baths, saqakhanehs, bridges, dams even aqueduct.

5.1. Reservoirs:

Due to dry weather of most parts of Iran, lack of adequate rainfall in more than 6 months per year, consequently seasonal rivers and inaccessibility of water, various arrangements have been made to provide fresh water in dry seasons including installation of dams and aqueducts. In this case, reservoir is used to store water in abundance seasons for rest of the year. Remains of oldest reservoirs back to first Iranian civilizations. Water reservoir of Elamite city, Dorantash, in Choghazanbil remains since 2th millennium B.C. There are remains of several reservoirs and canals at Persepolis of Achaemenid era. In Islamic period, reservoirs were constructed in community centers, such as along the market, local centers, and also wayside inns as well as other urban buildings. There was often a reservoir in most districts of hot and dry cities constructed by locals or by a rich benevolent person. Reservoirs were free of charge and managed by locals themselves. They only paid for maintenance costs. Reservoir was one of the most important buildings in hot and dry cities; its structure manifested by high vents and huge domes in far distances. Important reservoirs included beautiful entrance doors decorated by keystones and vaulted stones, and sometimes seven-colored tiles with a poem on Hoseyn Imam or a remembrance of the benevolent.

The date when the reservoir was constructed, was usually recorded on its portal [9].

5.2. Fridges:

Diverse climatic conditions of Iran resulted in various ethnic groups who lived in this land took considerable actions for the efficiency of the facilities to cope with changing and mostly adverse climatic conditions. Central plateau and the southern coast of Iran are facing with problems such as shortage of fresh water, the sultry summers, and severe heat on the banks of Persian Gulf and Oman Sea. The inhabitants of these lands have long taken advantage of specific provisions which are based on efficiency of existing facilities in the environment for favorable conditions and coping with climatic adverse conditions, as well as maximum use of natural resources to deal with these problems. The climate still remains. Still large and beautiful monuments stand up lonely around this vast territory, especially in the plains of Dasht Kavir; for years, they resisted against passage of time and natural disasters such as earthquakes, wind and rain and today, they caused surprise and admiration of architects and those interested in cultural heritage. Building of old fridges are the most exotic architectural elements which are not only popular anymore, but have almost forgotten. In the hearth of fridges and their products which in burning summers brought cool fresh water into the house, there is a mystery which indicates humbly miracle of adobe and powerful hands of a wise architect. Throughout Iran, especially in areas with hot and dry unbearable summers, ice has always been a matter of necessity which was used to preserve foods as well as cooling drinking water. Unlike public drinking water reservoirs and ponds in towns and villages constructed by charity and consecrated building and water, fridges were sources of income for the owners [13].

Three elements, air, earth and water, played a decisive role in Iranian architectural structure. Architecture of fridges and their structural technology is in such a way that architects of these units had to accurately consider important issues like insulation, maintain cold temperature proper to preserve ice, building materials and how to produce ice. Fridges are composed of three parts: long shading wall, ice producing pools and ice tank [10].

There are two types of ice tank:

- A) Dome-shape tanks as coverage of conical Barack.
- B) Tunnel-shaped vessels as rectangular long corridor.

5.3. Baths:

Bath has long been a place for cleanliness and purity and was associated with the religious life. But since the arrival of Islam and due to its commitment to cleanliness, bath found a special place architecture of which was of highly interest. Thus bath is deeply connected to Islamic civilization and the promotion of Islamic architecture as the core of Islamic cities. Following the arrival of Islam and due to its emphasis on cleanliness, baths found a particular attraction as a place for cleanliness with a variety of Islamic architectural decoration. Given the critical role of bath in Islamic era, they were constructed next to markets, schools and mosques and were considered as the core of Islamic city establishment. Baths were generally the most important service facilities in Islamic cities which are deeply connected to the history of Islamic civilization in terms of Islamic architecture. Because bath is related to Islam and purity of body and it has a special place in Islamic prayers. As prevalence of bath increased in the Islamic world, its importance cannot be ignored. Although the bath was a place for cleaning, other aspects can be investigated as well. Because the bath was a place for people to gather; they proposed their life affairs in bath and discussed about them; even it was a place to express various news; due to conditions of eastern countries it was considered as a place to transfer information; thus its necessity is undeniable among Islamic countries. Bath was expanded so that every class of people could use bath according to their financial situation; poor people used water of rivers, springs and streams for washing; rich people enjoy public baths. Although later on, rich people built a bath and a Vozookhanehs in their house. But public baths were known because of their special beautiful architecture and considered as welfare monuments of Islamic cities. Each baths built during Islamic era took advantage of that period architecture. But often, bath floors were decorated with colored marbles, ceilings decorated with innovative pictures and walls. When a person entered in, no longer wanted to leave and it made him comfortable and relaxed. Generally, there was a corridor or an entrance in baths toward a room with wooden closets to hang cloths on. Then, one could enter a large room and sit on wooden benches. There was a servant who performed washing by water and soap in a special room. He entered hot water room; hot water was provided from basement where water was heated by firewood. There was no window or hole, hence light could penetrate through a glass window installed on the ceiling. Therefore, baths played a considerable role in social life of Muslims in different events such as weddings, celebrations and holidays. Their beauty and decorating them was an important factor in attracting people [11].

5.4. Saqakhaneh:

Most saqakhanehs are built next to mosques and tekyehs. Others are constructed in crowded spots, like markets. Generally, saqakhaneh is a room with a door and a sash window which were up and down if needed. They were wooden and decorated by fretted pictures and beautiful porcelain knot. Counter stone which covered the wall in front of Saqakhaneh was used to prevent destruction by constant humidity and therefore has simple designs. Trough of saqakhaneh is a rectangular hollow rock 50 to 70 cm depth. Some of them have inscriptions that are like endowment document. Trough was put on the ground in front of Saqakhaneh and customers. There was a hole in the bottom to drain and refill the water. A white copper bowl often decorated by Ya Hossein, Damn Yazid, was used to drink water; it was hung by chain on the doorjamb of Saqakhaneh. Generally, saqakhaneh was a place to mix religious wishes and demands with public benefit; because it watered thirsty people. Meanwhile religious pledge to light a candle in saqakhaneh which in turn lighted the passages was a pleasant pledge. Religious prays and documents can be found there including pictures of prophets, Quran, spells and scrolls [12].

5.5. Aqueducts:

Aqueducts are ducts dig under the ground to flow water through. They include a canal and their length may reach thousands meters. Finally, water comes to the surface through them on a certain spot to be drunk and for agriculture. Great civilizations including Egypt, Mesopotamia, India, China, etc. formed next to rivers. However, Iranian innovation caused in developed great civilizations and rich cities in the margins of deserts far away from rivers. Iranian identified underground water beds; they directed fresh water of mountains to marginal desert, cities, villages and farms through aqueducts. Qanats are the most splendid team works and the most developed techniques to reach water date back to Iron Age; although, written documents indicates that Achaemenids developed in the light of aqueducts. However, qanat is an Iranian invention and it is considered as a special manifestation in Iranian civilization. Later, the pure Iranian technique extended to other parts of the world including southern Persian Gulf, northern Africa, Spain, western America and Chile. Total length of Iranian aqueducts is estimated to 400,000 km, i.e. a distance from earth to moon. Henry Goblo studied Iranian aqueducts for decades; he equals them with Great Wall of China. Currently, there are 40,000 active aqueducts in Iran with a length of 272,000 km. deepest aqueduct is in Gonabad with 340 m in depth for the main well and the longest is in Yazd with 100 km in length. It is worth noting that in arid and water deficit areas, digging tens of kilometers aqueducts and transferring millions of mud and stones from

depth of the Earth to the surface is only possible and feasible with respect to water. Water should be so sacred and valuable that man tries hard to access it. As the water flows off the aqueduct, it travels tens of kilometers and people use the water without contaminating. In these areas, water finds dignity only by formation of special value system which edifies and shows respect to water; then water consumption became possible. In these areas, edifying water is done as praise, gratitude, kindness, contentment, saving, hard work, sacrifice and dedication, patience and humility. Digging, maintenance, and guarding aqueduct and water is a sacred job which became a valuable culture. It is mixed by religious beliefs of people to take maximum advantage of water in arid low water areas [13].

5.6. Bridges:

Bridges are considered as a beautiful and splendid phenomenon in terms of architectural elements in addition to provide traffic over rivers significant examples of which can be observed in Isfahan. Bridge is an architectural element built on water path to relate both sides of it. A brief overview of these structures indicates how artistry their designers and builders are so that they can be easily differentiated from what is made today. For example, a factor manifested in most traditional monuments including Khajoo Bridge, is considering beauty and spiritual dimension of man handcrafts. This bridge is divided to several parts as a dam on Zayande Rood and as a place to distribute water according to certain standards. However, considering its special architecture, this hydraulic structure is able to represent other performances including magnificent beauty. Utilizing familiar architectural forms in the body of the structure is another feature of this bridge. This arrangement has modified and stylized solid body of the structure; saved it from being a pile of materials which wants to impose itself on humans and surroundings and created an environment familiar to observers. Flexibility or being a multidimensional construct, led to creation of passageway as well as a place for recreation and enjoying natural beauty for visitors while having a technical function. This multi-functionality is a representation of maximum utilization of funds and the force which are spent on a hydraulic structure [8].

5.7. Dams and pools:

Dams and pools which distributed and supplied needed water for agriculture and villagers by complex mathematical calculations, were indicators of knowledge and development of mathematics at the time. These pools were usually built along the path of springs and streams with little discharge. The

accumulated water in them was discharged once or twice a day; the water aggregated behind the pool wall was used to irrigate farms and gardens or to fill reservoirs [8].

6. Water and psychology:

Man is a complicated set made of spirit, mind and body. As the body needs food, mind and spirit need elements which pacify him. In an urban society surrounded by high buildings, streets and machine life, art and aesthetics is the best refuge for an exhausted spirit seeking peace. Today, hard-textured elements like concrete ... are observed in cities rather than natural elements (vegetation). Thus, a beautiful snug place should be provided using soft-textured elements to relax the spirit of mankind. This place can be parks and urban gardens. Water is such an element which touches the spirit both in rest and moving. The movement and music of water play a critical role in representing landscapes. Water can be designed as a rill or a spring for quiet places and as a waterfall or large fountains for crowded places.

Conclusion:

Water is a symbol of potential things. Water always plays a role in creation; mythology; traditions and iconography depart from cultural structures. It precedes all forms and it is a carrier and a staddle for creation. In one hand, water is a symbol of life; in the other hand, it is a symbol of death. It acts like a bridge between earth and high universe. Traditionally the role of water in the architecture of different regions and cultures has been significantly symbolized. understanding the concept of water in architecture or architecture of water, depends on understanding the physical laws of water, our emotions against actions and reactions of water, and most importantly, the role and analogy of water related to human. Water in architecture makes man see the natural surroundings, in addition to the elegance of building and precisely feel it by stimulating powers of sight, hearing and touch makes it. When the water is nearby, the sense of space is more understandable by its combinations and conflicts with nature. Sometimes water does not make any sound or produces very low. Therefore, silence of water sometimes is used in architecture. This brings man a sense of relief. Iranians have long been familiar with beauty and relaxing mode of water. Say, in the architecture of water it is invited into houses to show off and makes happiness. Water is undoubtedly the main and the most important and crucial element in forming architectural spaces. Water has always been a decorative, synthetic and relational element with environment and the main element in locating and forming spaces due to its

sanctity among Iranians. Form is differently manifested in the environment as a concept of water which has the closest objectivity, meaning architecture. Objective manifestation of historical concepts of water is familiar for everyone as a symbolic element. The objectivity itself has brought mental mixed concept of design in the history of locating. Indeed, beliefs and historical experiences related to water should not be considered as a cultural heritage. Rather, its principles should be considered wisely and applied in modern era.

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