A Survey of the Historical Evolution of Qanats in Iran

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Precipitation of Iran in comparison to the World

- World: 760
- Iran: 250
- Central plateau: 100
- Yazd: 60
According to Goblot, the innovation of Qanats took place in the western north of the present Iran and then was introduced to the neighboring area that was Zagros mountains.
Sargon II the king of Assyria (714 BC), noticed that the city of Uhlu enjoy a very rich vegetation even though there was no river running there. He realized that there were some Qanats behind the matter.
Achemenian Empire
(550-330 BC)

Achemenian ruling:

in case someone succeeded in constructing a qanat and bringing groundwater to the surface in order to cultivate, or renovating an abandoned qanat, the tax he was supposed to pay the government would be waived not only for him but also for his successors up to 5 generations
Egypt:
Seleucidion Era (312-250 BC)

During Seleucidian Era that began after the occupation of Iran by Alexander, it seems that the qanats were abandoned.
the Persians used the side branches of the rivers, the mountainous springs, wells and qanats to supply water.

the Parthian kings did not care about the qanats
Sassanid Era (226- 650 AC)

- Perfect regulation on both water distribution and farmlands
- Official rulings on Qanats, Streams, dams, etc…
- Rehabilitation of Qanats by the government
- Development of the cities on the basis of Qanats
After Islam:

In Iran, the advent of Islam that coincided with the overthrow of the Sasanid dynasty brought about a profound change in religious, political, social and cultural structures. But the qanats stayed intact.

Abbasid Era:

Abooyoosef Ya’qoob : whoever can bring water to the idle lands in order to cultivate, his tax would be waived.
Hamdollah Mostowfi:

“Zobeyde Khatoon constructed a qanat in Mecca. After the time of Haroon al-Rashid, during the caliph Moghtader’s reign this qanat fell into decay, but he rehabilitated it, and the qanat was rehabilitated again after it collapsed during the reign of two other caliphs named as Ghaem and Naser. After the era of the caliphs this qanat completely fell into ruin because the desert sand filled it up, and later Amir Choopan repaired the qanat and made it flow again in Mecca.”
Abdollah bin Tahir managed to bring together all the clergymen from throughout Khorasan and Iraq to compile a book entitled “Alghani” (The Book of Qanat).

- The number of Qanats has been so considerable
- The Qanats were of interest to the government
The book “Extraction of Hidden waters” written by KARAJI in 1010 AC

These documents all certify the importance of qanats during the Islamic history within the cultural territories of Iran.
Many Qanats and irrigation systems were destroyed and dried up.
Ilkhanid dynasty

Revival of the Qanats & irrigation systems

- Al- vaghfiat Al- Rashidia (by Rashidoldin Fazl –Allah)
- Jame al- kheirat (by Seyyyed Rokn al- Din)
Safavid Era (15th -16th Century):

Shardan: “the Iranians rip the foothills in search of water, and when they find any, by means of qanats they transfer this water to a distance of 50 or 60 kilometers or sometimes further downstream. No nation in the world can compete with the Iranians in recovering and transferring groundwater”
Dynasty of Qajar (16\textsuperscript{th}- 18\textsuperscript{th} century)

the time of Qajar can be considered as the heyday of qanats

Jaubert de Passa (1840):

- Hamadan: 50,000
- Isfahan: 200,000
- Tehran: 130,000
Aghasi said to the worker:

“The qanat may not get us the water, but will get you a living”
Period of Pahlavi:

During this period, the process of qanat construction and maintenance continued.

Safi asfiya (1942):
- number of qanats: 40,000
- discharge: $18.2 \times 10^9 \text{ m}^3/\text{year}$

(1961):
- number of qanats: 30,000
- discharge: $17.3 \times 10^9 \text{ m}^3/\text{year}$

(1959):
White Revolution
Period of Pahlavi:

The introduction of the modern devices that made it possible to drill many deep wells and extract the groundwater much more quickly and easily aggravated the qanats’ annihilation.

(1963): establishment of the ministry of water & Electricity
(1966): Law of protection of the groundwater resources
(1968): Law of water nationalization
The time of the Islamic Republic:

1981: National Conference on qanat (Mashhad)

Jihad agricultural Ministry is responsible for the Rehabilitation of qanats and continues to grant some funds to the stakeholders to maintain their qanats

Annual budget of qanats: $13 \times 10^6$ USD
<table>
<thead>
<tr>
<th>year</th>
<th>No. of Qanats</th>
<th>Discharge (10⁹ m³/year)</th>
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<tr>
<td>1984-1985</td>
<td>28038</td>
<td>9</td>
</tr>
<tr>
<td>1992-1993</td>
<td>28051</td>
<td>10</td>
</tr>
<tr>
<td>2002-2003</td>
<td>33691</td>
<td>8</td>
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<tr>
<td>2003-2004</td>
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2000: International Conference on Qanats

2005-6: Establishment of the ICQHS
Conclusion:

In the course of Iranian history, the qanat has had many ups and downs. Sometimes the qanats as well as the qanat constructors were supported and encouraged by the governments, and sometimes were deserted. Even when the qanats were destroyed for some military purposes, the qanat would start flourishing as soon as the political situation became stable. The risks that are threatening the qanats today differ from those in the past. In other words, in the past the political and military crisis had a negative impact on the qanats, however the qanats could recover as soon as the crisis was over. But the present risks are quite something else, and more destructive. The present risks are acting environmentally so it is not that easy to handle them.
Conclusion (cont):

Therefore it is a must for the governments and nations throughout the world to more think of the new legislations about the protection of groundwater resources against any kind of over exploitation.

Qanat civilization is rooted in this ancient hydraulic structure. Over the past 3000 years, the system of qanat has underlain many technological, social, moral, economical and legal principles that have formed an important part of our culture. These principles evolved into the present state by being passed from generation to generation. The present generation is supposed to build on these principles behind which there are three thousand years of history, not to forget about them.
Acknowledgments