



# Qanats in Syria ease the water shortage

Joshka Wessels

**Solutions to water shortage in arid areas include traditional methods as well as modern techniques. This article shows how ancient water systems called *qanats* can be used to provide small communities with a sustainable water supply for drinking and irrigation.**

**Q**anats are subterranean tunnels that tap the groundwater and lead water artificially to human settlements and agricultural lands, using gravity. Shafts intersect the tunnel at regular intervals to provide air to the excavators responsible for their upkeep. Most *qanats* are located on the slopes of piedmont alluvial fans, in intermontane basins, and in alluvial valleys. In these locations, this groundwater collection system has been able to bring water to the surface and support settlement in regions where no other traditional water technology was effective.<sup>1</sup>

The technique originates from ancient Persia more than 2500 years ago. The global distribution of the technique roughly coincides with the major dry regions in the world, except Australia, North America, sub-Saharan Africa and cold deserts. The most northerly *qanat* has been found in Luxemburg, Europe. *Qanats* are technically sustainable systems, but they also require a certain level of maintenance and social organization to use them in a sustainable way.

In modern times, *qanats* have often been unable to provide enough water

for large-scale agriculture and to meet the water demands of an exponentially growing population. The alternative, of excessive pumping, is a major threat to both the aquifer and the survival of *qanats*. Another threat is the out migration of young men in order to find off-farm work in urban areas. As a result, a valuable cultural and technological heritage is silting up and vanishing.

## Reviving an old technique

In Syria, a current total of 42 *qanat* sites have been found containing 91 *qanats*, 30 of which are still in active use. Most of the *qanats* originate from Roman times. Bearing in mind the sustainable nature and potential of *qanats*, a pilot project in 2000 studied the feasibility of using a *qanat* in one community. The village concerned is called Shallalah Saghirah and consists of 122 people depending solely on the water supply from a *qanat*.

Its communal *qanat* is 600 m long and has its outlet in the middle of the village. From the outlet, the water runs through an open canal until it reaches an irrigation reservoir. Drinking water is collected at the outlet and is free for everyone to use; domestic water can be drawn from the open channel by village residents and their guests, for whom it is free.

The irrigation water follows a traditional system of rights and regulations. The family that has the so-called 'water day right' opens the reservoir at sunset, to minimize any loss through evaporation. When the first family member uncovered the *qanat* a century ago, he and his five sons built the reservoir for irrigation. Each brother had one 'water day right', and his descendants inherited the right. But today the five brothers have grown in number to 122

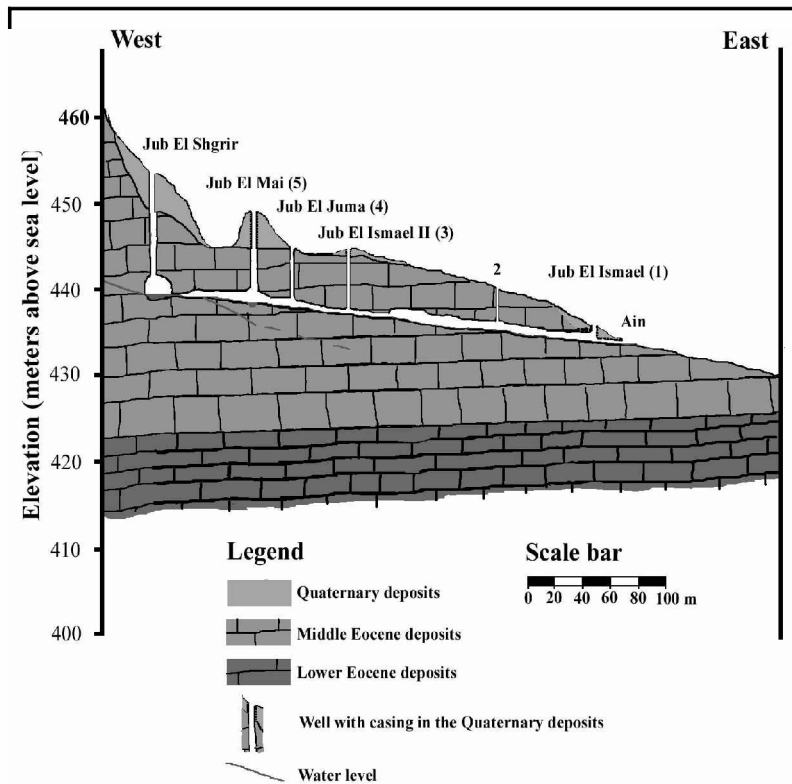


Figure 1 Cross-section of the *qanat* of Shallalah Saghirah (Source: Hooegeveen/Wessels)



Outlet of *qanat* in Shallalah Saghirah  
(Photo: Joshka Wessels)

people in eight extended families. The share-out period has gone from five to 15 days. The water day right can be rented out or sold when people migrate. It is the only water type in the community that is paid for. Competition between village elders to buy each other's 'water day right', when families have migrated to the cities, has strained relationships between households and weakened the social cohesion in the community.

### Getting people together for community action

The first challenge that the project faced concerned the involvement of all stakeholders in renovating the *qanat* of Shallalah Saghirah. Silt choked the waterway and two airshafts were dangerously blocked with stones and sand; however, the co-operation needed to carry out renovation was prevented by personal clashes between village elders. The village does not have a chief (*mukhtar*) to solve differences and this weak leadership formed a constraint for the regular maintenance of the *qanat*. The presence of the research team and many separate focus group meetings stimulated the village elders to settle their differences. During the feast (*aid al fitr*) after the Islamic fasting of Ramadan, a local religious leader guided the settlement in January 2000.

An informal committee was established and an agreement was written among the group to regulate the maintenance and renovation work of the *qanat*. During a focus group meeting, a technical work plan was developed by the village elders, which included their priority activities concerning the renovation and the estimated number of working days for each activity. The activities would cost in total around US\$7800.

### Cleaning an ancient tunnel

After some local fundraising, grants were given by the Dutch and German Embassies in Damascus and cleaning work started on 17 June 2000. The village committee organized a group of workers and they chose a supervisor. The community work plan was followed and the supervisor made a weekly work programme with a rota of workers. The whole cleaning activity was officially classified as an archaeological excavation, since it concerned a Byzantine site, so a representative of Aleppo Museum attended the worksite daily.

During the first stages of cleaning the main airshafts, team spirit was high and work progressed well. After six weeks, however, enthusiasm was flagging and, after disagreements between the villagers' elected supervisor and some group members, the group supervisor suggested that the museum official organize the workers' programme. As a third party not related to the workers, he served as a respected mediator.

The team spirit revived and a certain strengthening of the community was noticeable. Around four weeks before the proposed completion date, however, a cousin who had been working in Lebanon returned to the village and decided to pick up an old revenge case. The workers' group split into two factions and the work had to be halted for 22 days until the problems between the cousin and his family were resolved with the help of a traditional Bedouin judge. The earlier co-operation had deteriorated significantly, however. The work was completed on 16 September 2000, and concluded with the slaughtering of three sheep for a communal meal.

### A future for *qanats*?

After the cleaning operation an increased water flow of 30 per cent was measured during the winter months. Another promising result is that 16 young men from the community are now trained for *qanat* cleaning and are able to maintain their *qanat* in the future. Whether that is socially sustainable remains to be seen in the long term. When we returned in the summer of 2002, the village was still divided into different descendant groups, but the *qanat* was flowing and according to the villagers had given a substantial amount of water throughout the year.

The conditions necessary for undertaking future renovations of *qanats* are determined by both technical and social factors. Technically, boreholes should not be placed within a radius of 3–5 km of a *qanat*. But even more important are the social factors. A strong leadership and community cohesion are important prerequisites for any management of a common water resource in the Middle East. As the case of Shallalah Saghirah shows, even if the community consists of only one large descendant group, rural community action to safeguard a common resource is not an easy option when personal clashes persist and leadership is weak. Searching for urban opportunities may seem much more attractive than renovating a *qanat* for young people wishing to make a living.

Following the pilot project, a nationwide survey of Syrian *qanats* was conducted in 2001. Sites were then revisited in August 2002. Although it was found that some had considerably decreased in flow during the intervening year, some promising results came from renovation efforts that were implemented by farmers and the directorate



Irrigation reservoir  
(Photo: Joshka Wessels)

# The Middle East



Clearing the *qanat* air shaft  
(Photo: Joshka Wessels)

of irrigation in the south-west region, backed by embassy funding.

As early as 1976, Safadi<sup>2</sup> made an emotional speech at a UNESCO conference in Rabat in an attempt to protect

these sustainable water supply systems. Although some countries like Iran and Oman have decrees and laws to protect *qanats*, a regional project in the Middle East still does not exist.

The major focus of the Middle Eastern water debate is rightly on water-use efficiency and virtual water imports. To let these existing systems vanish into oblivion, however, would certainly be missing an opportunity to ease the alarming water shortage at a community level.

### About the author

Joshka Wessels started her research on traditional water management as a Junior Professional Officer on Applied Anthropology for The Netherlands Development Assistance (NEDA) in 1999. She was based at ICARDA from 1999–2001 where she conducted her fieldwork.

This project was executed by the International Centre for Agricultural Research in Dry Areas (ICARDA), Aleppo, Syria and financially supported by DGIS, Ministry of Foreign Affairs, the Netherlands; UNU, Tokyo, Japan; and the Dutch, German and Swiss embassies in Damascus, Syria.

This is a revised and shorter version based on earlier publications by Joshka Wessels, including *Tunnel*

*Vision*, a TV-programme produced and directed by Joshka Wessels for the Television Trust for the Environment.

The film *Little Waterfall*, a 52-minute documentary on *qanats* in Syria, received an award during the Royal Anthropological Institute's film festival, University of Durham, UK, 4–6 July 2003. ([www.dur.ac.uk/rai/festival](http://www.dur.ac.uk/rai/festival/durham.ac.uk/rai/festival)). VHS copies are available from [info@sapiensproductions.com](mailto:info@sapiensproductions.com)

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