Hydrogeomorphology, Vol.6, No.23, Summer 2020, pp (12-16)

Received: 2018.12.13
Accepted: 2020.07.21

Abravaneh (Rodab) Underground Water Channel for Water Transfer *(Case Study: Nodeh Enghelab Village of Khoshab City)*

Ali Akbar Shayan Yeganeh*

Instructor of Farhangian University, Sabzevar Allameh Tabatabai Branch ,Sabzevar,Iran

1-Introduction

Due to the dry weather in Iran, water supply has been plagued by complex systems and requires comprehensive management, the sustainability of these biological systems. Iranians have used a variety of water transfer and extraction systems that were unique in their time and this regard, they have been thinking about the optimal use of groundwater harvesting techniques and promoting further education. Some of these methods are completely native and the same is not seen in other parts. Many of the current procedures and methods of human life are out of ecological ability and cannot be sustained. Therefore, methods and techniques are considered that are consistent with the ecological laws (Boozjmehri and Khatami, 2018: 123). A review of historical records shows that rulers and people were paying attention, drilling aqueducts as one of the main water supply methods in arid areas (Omidi et al., 2016: 34). Other methods are Rainwater and runoff collection that have been considered for the proper utilization of water in arid regions (Eshghizadeh, 2009). Other methods of water supply in arid areas include the transfer of water from rivers and inaccessible water sources (Halabian and Shabankari, 2010). The purpose of this study is to investigate and introduce an interesting traditional and native method of conveying water to a corner of Iranian land that interestingly drives water on the fan to be used for agriculture. In this research, while introducing this method, the benefits, disadvantages, and costs of ecosystems are investigated and introduced to keep indigenous methods in place, if necessary, to Resuscitate and promote them. The study area is located in the northern slopes of Jaghatai mountains, Nodeh

* (Corresponding Author), **E-mail**: aasy1358@gmail.com

Enghelab village of Khoshab county and 57 degrees 37 degrees and 54 seconds to 57 degrees, 37 minutes and 6 seconds east and latitude 36 degrees 29 minutes 45 seconds to 36 degrees And 27 minutes and 52 seconds north.

2-Methodology

The present study seeks to investigate the Abravaneh in terms of method of construction, properties, advantages, and disadvantages by using descriptive - case and comparative study and using various documents and maps as well as various geographic software such as GIS. Information about the subject is gathered from library resources and various documents such as books, collections of articles, geological maps (1: 100,000), and topography (1: 50000) and internet resources such as Google Earth and valid websites. The materials were collected through observation of the area and interviews with the owners and owners of irrigated plots by Abravaneh and those who knew it.

3-Results and Discussion

The results of this study indicate that unlike the aqueducts, they have begun to dig deliciously from the upper reaches of the basin (entrance valley), therefore, the entrance valley and the main river, which is to be transported from it, is considered as the mother of the well. The differences between Abravaneh and aqueducts are given in the table below.

Table 1: Differences and similarities between Abravaneh and Qanat

Row	Channel feature	The difference between aqueduct and Abravaneh	Similarity of aqueduct and Abravaneh
1	Tunnel specifications	The slope in the aqueducts is a function of the terrestrial part and in the reputation is the function of the river and the slopes in the Abravaneh are more than the aqueduct.	Both drain the water from the high slope to the low slope.
2	Well bars	The depth of these types of wells in the aqueduct is increasing from the manifestation to the mother well, but in the Abravaneh it is sinusoidal.	Both require several wells to drill.
3	How to build	In the aqueduct, the tunnel is drilled from the outlet to the mother well, but in the fountain, it is blown from the inlet to the outlet.	Both pull the soil out of the tunnel and the good bar in the same way.
4	Application	The aqueduct drains groundwater while diverting water from a river.	Both transmit water.
5	Made of excavated sediments	In aqueducts, the diversity of formations is more than Abravaneh. Usually in Abravaneh of a formation and it is generally quaternary formations that are dug.	Drilling complexities in formations are the same in both.
6	Destruction	Weak formations in the Abravaneh of this phenomenon are more exposed to destruction	Both have a talent for destruction
7	Usage times	The water output of the aqueducts shows fewer fluctuations than Abravaneh because groundwater is more uniform than surface water.	In both, it is often used except in winter.

The length of Abravaneh is 3186 meters in total, and the average depth of the shaft of wells (depth of the shaft divided by the number of shafts) reaches 16 meters, since it is carved, a well every 50 meters, in total, there are 64 wells drilled. If each square meter of the soil weighs about 500 kg, then 2096 tons of soil is displaced. Transferred water is often used to produce wheat, barley, forage for livestock, and sometimes irrigation of vineyards. The end of the Abravaneh has been severely

eroded after falling. The appropriate dip for the canal and minimize the water penetration in the canal by placing the silt on the channel floor. Another advantage of this method of water transfer is 1- bring water to the surface of the alluvial fan, 2- redirect water and use in upstream, 3- less cost than other methods, 4- use to a small aqueduct.

4- Conclusions

In terms of soil texture, the (alluvial) fan is one of the most suitable places for agriculture. Abravaneh is the transfer of water from the river that is located next to the fan on its surface. People in the area with native techniques and techniques are restraining it and guiding it on the fan Abravaneh need repairs and in some loose formations, it is possible to drop the roof of the Abravaneh tunnel. This method has been forgotten by digging deep wells and one of the humanitarian initiatives is forgotten. For durability and continuity. Abravaneh needs care and repair, and the owners of the area have done repair and mending work in turn.

Keywords: Abravaneh, Qanat, Water transmission, Nodeh Enghelab Village, Khoshab of Khorasan Razavi

5-References

Bozorgmehri St. Khatami S. s. (2019). Recognition of aqueducts, paving the way for sustainable development in "Karizi civilization", a case study: Zarch aqueduct, Yazd province. *Water and sustainable development, 5 (1),* 132-123. https://doi.org/10.22067/jwsd.v5i1.63168

Halabian, Amir Hossein; Shabankari, Mehran (2008). Water Resources Management in Iran (Case Study: Challenges of Water Transfer from Beheshtabad to Zayandehrud), *4th International Congress of Geographers of the Islamic World, 13 pages, HTML.104_ICIWG04-ICIWG04-Paper / com.civilica.www: // https*

Eshghi Zadeh, M. (2009). Method of determining suitable areas for the construction of small underground dams to feed and control the flow of aqueducts, a case study of Kalat watershed in Gonabad city. *Master Thesis in Watershed Management, Faculty of Range and Watershed Management, Gorgan University of Agricultural Sciences and Natural Resources*, 1-213.

Omidi, Hananeh; Jahanbakhsh, Ramina; Karami, Hamed (2016). Aqueduct and its role in cities, *Journal of Urban Planning Scientific Association, No. 6, Fall 2016*, 43-34.