

A short review of rain water catchment systems and their applications in Iran

Part: 1

The fact that rainfall is very scanty in arid and semi-arid regions of Iran shows the importance of water harvesting apart from the quantity of rainwater collected. The total water demand in any location is the sum of the sectoral demands. The portions will differ according to the position and activity, which, in turn, will largely influence the magnitudes and trends of demands. Domestic water demand plays a crucial function, as potable water of an acceptable quality is essential for the survival of humanity. Arid and semi-arid regions occupy more than 80 percent of Iran's land. Short duration and high intensity are common characteristics of rainfall in these regions. The average precipitation is about 250 mm in Iran, which is less than one third of the world's mean annual precipitation. However, arid parts of the country receive much less than this amount. Temporal and spatial distribution of rainfall is also quite unfavorable. To overcome the water scarcity in these regions, inventive traditional water management systems have been locally developed. These systems can be used to meet household, agricultural and other demands. The rate of water demand in a region depends on the climatic conditions and the level of knowledge and technology in that region. Iranian people have gained several innovative technologies from ancient periods. Some of these technologies are summarized in the following:

A) Qanat

In some places water has been supplied from surface water resources such as rivers and streams. In other regions people have lifted groundwater by digging wells and Qanats. In some more arid regions with insufficient rainfall to provide surface runoff, in the absence of enough precipitation, the level of water table is so deep that it is not economical and feasible to obtain water by digging wells and Qanats. Figure 1 shows an illustrative view of a Qanat.

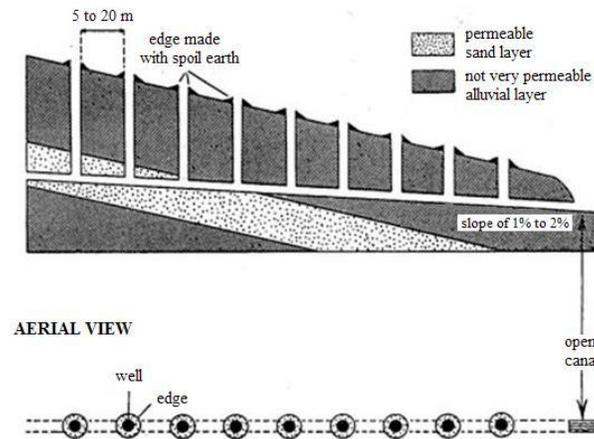


Figure 1: Illustration of Qanat as an Iranian ancient

B) Ab-anbar:

Alternatives which are capable of supplying water for the community can be other water harvesting systems such as "Ab-anbar" which is a structure that can store the surface runoff resulting from precipitation. Figure 2 shows a view of Ab-anbar in dryland environments of central Iran.



Figure 2: A view of Ab-anbar in central Iran

C) Floodwater spreading system

Floodwater spreading systems are of the most important ways to make reliable water resources. These systems are planned for the artificial recharge of groundwater, range improvement, moving sand stabilization, afforestation, etc. This water harvesting

technique has been a common way of water resources development in arid and semi-arid regions of Iran since many years ago. Figure 3 shows a plan view of flood water spreading systems.

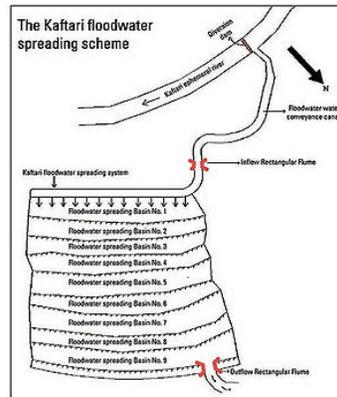


Figure 3: A view of a flood water spreading system.

D) Bandsar:

Bandsar is another structure which can be suitable as a water harvesting body. It is a pond or a surrounded piece of land within embankments on contour lines around or along dry river routes or on hilly areas in order to conduct and maintain floodwater in which the collected water gradually seeps into the soil. Fertilized soil with enough infiltrated water then is used to growth different crops such as melon, watermelon etc. A plan view of Bandsar is shown in figure 4 shows.

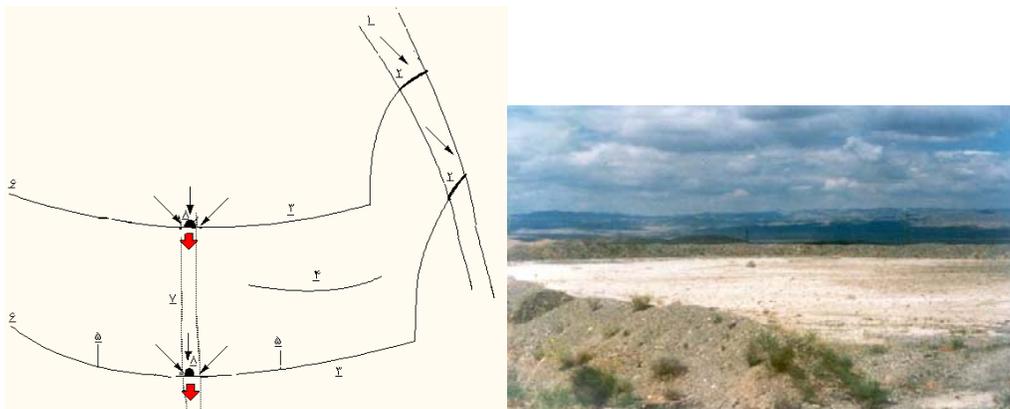


Figure 4: A plan view as well as picture of Bandsar

Written by: V. Mosavi¹ and M.T. Dastorani²

¹ PhD student of watershed management sciences and engineering, Yazd University, Iran

² Associate professor, Faculty of Natural Resources and Environment, Ferdowsi University of Mashhad, Iran