

Agriculture and Forestry in Pakistan (4)

Part 4: Karez farming in Balochistan

A karez is an underground water course irrigation system which channels ground water from the foot of the mountains to the plains using gravity. These irrigation tunnels have different local names, for example, in Iran they are known as qanats. In Pakistan, people have been practicing irrigation farming by karez since ancient times in the areas around Quetta, Kalat and Makran etc. in the state of Balochistan. The merit of a karez is that once constructed it does not require any dynamic energy to run it, and, because water is transported underground, loss of water from evaporation can be avoided. Karez were devised to fit the natural conditions of the arid land and have been used for thousands of years. It is an important system to consider in the quest for sustainability of arid land agriculture, as discussed in AAINews Vol.9.

In recent years, however, the decrease or depletion of water in the karez is becoming a problem in Balochistan, due to an increase in the number of well irrigation systems and the accompanying over exploitation of ground water. According to official statistics, around 1970 the acreage under karez irrigation in the Quetta region was 25,000-30,000ha, while land irrigated by well water covered some 5,000ha. The acreage under well irrigation gradually increased, and according to the agriculture census of 1990 the karez irrigation area was then about 13,500ha while the well irrigation area covered about 24,000ha. Behind this trend is population growth and the increase in cultivation of apples as an important commodity product.

As a counter measure to the problem of dwindling karez irrigation since the 1970s, the Balochistan state government has been promoting construction of 'ground water recharge dams'. Unlike so-called 'underground dams' made with water barriers under the ground, the ground water recharge dams look similar to conventional reservoirs. Where they differ from reservoirs (which attempt to retain water), ground water recharge dams aim to recharge ground water supplies by swiftly releasing their contents into the ground. In Balochistan, as of 1996, there were over 100 ground water recharge dams. Despite such efforts, however, because of the increase in water demand, a decrease in water recharge efficiency due to the accumulation of sand after construction, and destruction by flooding etc., the ground water recharge dams have not been serving their purpose and the ground water level continues to fall.

It is very time-consuming and expensive to construct new karez or maintain the existing ones. Therefore, it may be a natural that the irrigation scheme using wells, which is easier than karez, becomes more popular and widespread. However, at present there is no incentive for water saving to increase efficiency of ground water use. This is because with the unstable supply of electricity it is a rule that as much ground water as possible is pumped while there is electricity. Furthermore electricity consumers are charged irrespective of the amount of electricity consumed, making it more 'cost-effective' to use more electricity. Ground water in such dry areas as Balochistan is a very limited resource, and for its sustainable use, it is necessary to facilitate water saving efforts, to grasp appropriate use levels and to establish regulations that reflect the realities of resource availability. It is also necessary to improve the legal infrastructure, for example the taxation system in order that it should serve as an incentive to protect the valuable water resources.



Fetching water at the end of a karez



Ground water recharge dam



Cultivation of fruit trees and pasture