Mini-Series: Efficient Use of Water Resources in Arid Land

Part 2: Traditional method of water use in Morocco

In Morocco, though some parts in the north do have rich water resources, most of the land belongs to the semi-arid and arid zone with an annual rainfall of 100-700mm. In such regions it is difficult to provide enough water to all the farmlands with irrigation. Therefore the traditional method of water use (water use rights) has been used to adjust to the limited water availability. On the other hand, modern technologies are also being introduced recently for more efficient use of water resources.

Photo 1: Drip irrigation is getting popular in recent years

The newly introduced technologies include the centre-pivot irrigation and drip irrigation methods (Photo 1). These technologies are used for cultivation of cereals such as wheat, and vegetables, making a good contribution to increased productivity. However, many farmers have not been able to afford such modern technologies due to lack of funds and capacity. Those farmers, bound in the traditional water use rights, are engaged in the traditional method of efficient use of limited water resources with the help of nature and livestock. Basically, the closer one is located to the source of water, or the higher up the stream one is located, the stronger are one's water use rights. The rights are handed down from generation to generation, making it difficult to obtain new water use rights. On the other hand, however, it is also a fact that this traditional custom sustains the agricultural activities of the region.

Photo 2: Shallow well using livestock power

Photo 2 shows a shallow well reliant on livestock power, and the amount of water available from this well determines the extent of vegetable cultivation in the summer. Photo 3 shows a simple ditch to capture water from irregular floods into the farm. In this region wheat cultivation is carried out to whatever extent possible given the limited water available from the overflow from irrigation water in the upper basin, and rainfall. In the years when the amount of water is not enough to produce wheat of sufficient quality to sell as cereal, then the substandard wheat is used for cattle feed.

Photo 3: Simple ditch for capturing rainfall

These methods try to utilise whatever water is granted by nature in the year, thus they can be called sustainable water use technologies that have been inherited over many years. The location and number of shallow wells make it possible to estimate the amount of water usually available in the region, while the location of irrigation ditches helps us understand the irregular movement of water over many years. When the area of the upper basin region with a constant water supply and the amount of water use in the region are taken into account, it becomes possible to estimate the amount of currently available water resources in the entire region. This should be able to serve as an important factor in drawing up a future development plan.

For effective use of limited water resources it is crucial to have not only technological development of crop cultivation and irrigation, but also a good understanding of the traditional water use methods inherited in the region over many years. Also, it is needless to say that excessive development of water resources will only mean eventual water depletion. Determination of development scale should be done based on the real resource development capacity in each region. And traditional customary technologies and restrictions that have been practised in the region for years (regarding the cultivation area, crop types, period of cultivation, space between wells, irrigation frequency etc.) should be considered for such determinations. Only then would the modern agricultural technologies, which are to be introduced in the future, work sustainably in the respective region.