

Agriculture and irrigation in arid lands: From a viewpoint of sustainability (3)

Part 3: Falaj and oasis agriculture in UAE

One of the traditional water utilization methods for agriculture in arid regions is a system by which underground water in mountain areas is directed into plain areas using tunnel channel. This method goes by different names in different regions; in some places for instance, such tunnel are known as "qanat", in other areas they are called "karez", or "foggara" and so on. In UAE, they are called "falaj". Falaj's water is supplied into oases where date palms are grown and various crops are cultivated. In oases, people often utilize land in multiple layers; date palms in the upper layer, fruits in the middle layer, and pasture or vegetables in the lower layer. This use of space is not only very efficient, but tall date palm trees also keep temperature in oases lower than outside. Likewise they keep local humidity levels higher, as well as acting both as windbreak and shields from direct sunlight.

In oases, basin irrigation is facilitated, which is said to be a less efficient use of water compared with so-called "modern" drip and sprinkler irrigation. However, bearing such problems as salinization in mind and seen from the viewpoint of sustainable agriculture, it is debatable as to which method is actually superior. It is necessary to conduct scientific investigation on the situation and to make efforts to improve water utilization methods and apply them to some other uses.

Although this is not directly related to falaj, in Mongolia, it is said that people build their houses a certain distance from the nearest water source. This is a deliberate act; by making it difficult to fetch water the Mongolians ensure that water supplies are not overused. They are self-human desire to use as much as water available. This way of thinking is very important in arid regions with limited amounts of usable water.

Falaj also provide a limited amount of water, although the actual quantity varies from time to time. The amount of available water determines the size of cultivated areas and therefore works as a restraining force. By contrast, irrigation for agriculture is provided by underground water extracted with pumps. There is no apparent restraining factor, which could lead to irreversible results by lowering the underground water table through excessive pump extraction. If agricultural development goes beyond the productivity and scale appropriate to an area's natural carrying capacity, production may increase temporarily but it will not be sustainable. It may be that we are taking production which originally should be left for our future generations. With sustainability in mind, it is necessary to preserve some for the future. Although the theme of this essay series is "water use in arid area", given the fact that resources and food are limited, what we are talking about here may apply to the world as a whole.



A channel of falaj flowing through an oasis



Cultivation scenery in an oasis