Good Practices in Agricultural Water Management
Case Studies from Farmers Worldwide

Foggara: Traditional Irrigation in Algeria

FIPA IFAP

Water Scarcity in Algeria

Persistent water scarcity is a harsh reality in Algeria. With an estimated 500 m^3 of water per capita in 2000, Algeria experiences water scarcity, an annual level of renewable freshwater that falls below 1000 m^3 of water per capita. In order to attain a level of adequate food security, 15 billion to 20 billion m^3 of water is needed annually, with 70% of this quantity reserved for agriculture. In reality, only 5 billion m^3 of water is mobilized each year and as result, there are significant conflicts over water use in Algeria.

Sustainable Agriculture

Sustainable development of agriculture became a priority in Algeria in 2000. The Plan National de Développement Agricole (PNDA) is a policy that advocates the sustainable, integrated development of rural areas by fostering the conservation and rational management of natural resources such as soil and water. This plan involves the participation and cooperation of government and farm groups in fighting rural poverty and reinforcing food security. The PNDA targets issues in desertification and water management, and some of the incentives introduced for farmers in water management are:

- Government participation in reconverting irrigation systems and water management
- The transfer of responsibility for drainage operations and localized irrigation systems such as drip irrigation to the Government in hopes of saving and conserving water

Water Management in Agriculture

All agriculture in Algeria involves irrigation. In Northern Algeria, the introduction of drip irrigation on industrial tomato farms raised the average yield of tomatoes from 13 tons to 19 tons. Although the increase in yield is a desired result, the introduction of modern agriculture, which advocates monoculture and irrigation using high volume pumps, may have adverse consequences on underground water sources. Consequently, underground water resources are overexploited in the north.

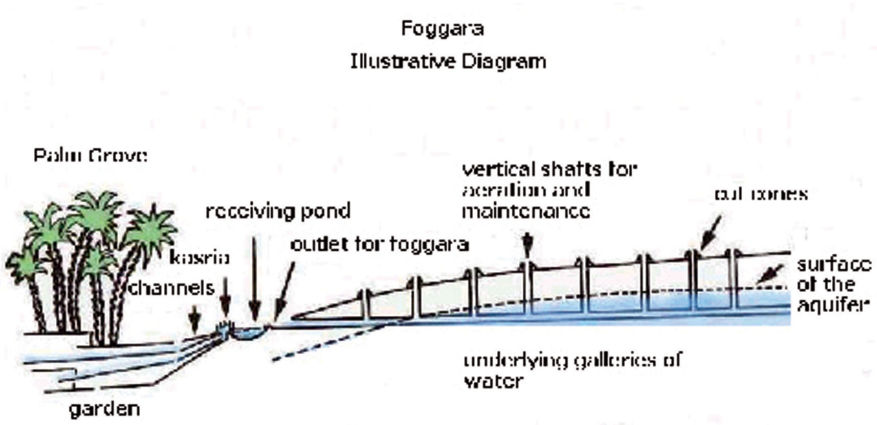
A traditional form of irrigation called foggara, whose origins can be traced back 3000 to 4000 years, is an alternative to modern irrigation. Foggara is used in Southern Algeria on conventional farms and serves as a source of water for several oases in the Ouled Saïd, a human-made wetland that covers an area of 25,400 hectares in southwest Algeria.

Foggara

Foggara is the French translation of the Arabic word "qanat" or the Pashto world "karez". Foggara was first practiced in Iran and brought to North Africa during the second expansion of Islam. The foggara system is a complex network of vertical shafts dug into a sloping plateau overlooking an oasis. These vertical shafts or wells are connected by an underlying channel, which has a gradient flatter than that of the ground. Water is drawn from an aquifer within the plateau by the force of gravity and directed through the channel to the surface for agricultural or domestic use.

There are three significant benefits of the foggara system of water delivery. These benefits include:

- Water loss through seepage and evaporation are reduced because a majority of the channel is underground
- The is no need for pumps as the system is fed entirely by gravity



Foggara and Algerian Farmers

In the desert, land alone is not considered real capital, as its value is intrinsically tied to water rights. The ownership of water can be acquired through the investment of labour or money in the construction of a foggara. Partnership agreements between the owners of un-irrigated land and the owners of water quotas determine the share of water received by each recipient within the partnership and are based on the size or level of investment contribution. For regions of Algeria where this type of socio-economic arrangement still persists in conventional agriculture, the operators of foggaras have set up professional associations.

In one region of Southern Algeria, a partnership called "association-sharing" exists between owners of un-irrigated land and owners of water quotas for the production of palm dates. In this type of agreement, the owner of the un-irrigated land transfers half of the property rights to his land to the owner of the water quota. After approximately seven years when the palm trees first bear fruit, the "association-sharing" ends. At this time, the landowner assumes permanent ownership of the water on his land. Both individuals benefit from this type of partnership as each claims half the ownership of a palm grove that would not exist without foggara irrigation.

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