

#### 6.4 Country Report of Jordan

The total irrigated area of Jordan is 360 000 donums. About one half of this was put under irrigation for the first time during the last 15 years.

The sources of irrigation water are mostly surface water. However, the total area irrigated from groundwater resources does not exceed 25 000 donums in the eastern desert and 40 000 donums in the Jordan Valley and the occupied western highlands. The quality of irrigation water is fairly suitable for irrigation, its salt content not exceeding 800 ppm, except in the case of the groundwater used in the desert where the salinity content may be as high as 2 000 ppm.

In the Jordan Valley where about 124 000 donums were brought under irrigation in the 1960's, waterlogging has become a problem within the last 10 years. The total area affected by salinity and waterlogging as a result of irrigation in the Jordan Valley is about 15 000 donums at present and is increasing every year. The authorities are aware of this problem but due to existing conditions nothing has yet been done in this regard, although it is considered in the official annual budget every year.

The desert area of Jordan makes up about 78% of the total area of the country. The soils of this desert are calcareous and saline-alkali. Groundwater used in irrigation of the desert irrigation agricultural projects is saline. The soil also contains a subsurface horizon rich in carbonate and compact in nature which is 30-90 cm below the ground surface. A 10 000 donums project in the southern desert mud flats is under development although soil permeability is less than 1 mm/h. The soil is saline and pumping of groundwater is expensive. The Bonifica contractor company carrying out the work in this project is trying to avoid waterlogging and salinity by the use of controlled sprinkler irrigation which successfully improved plant growth during the first two years.

Drainage as well as leaching of salts is necessary for the irrigation development of the desert lands. An economic justification for the desert irrigation projects has not yet been proved. However, five projects irrigated by groundwater are being completed at present and further investigations are to be made in the future before the question of economy can be correctly assessed.

Although soil studies and mapping of saline soils were made on a detailed and a semi-detailed scale for about 250 000 donums, reclamation work was carried out on a small scale on different sites. The reclamation work included the extension of the East Ghore irrigation canal for 8 km and an increase in the irrigated area of about 8 000 donums where irrigation and drainage systems were executed. In this area about 265 families will be settled.

The first stage of land reclamation of the Wadi Duhlel irrigation project was completed this year. An area of 6 000 donums was distributed to farmers at a rate of 2.5 ha per family. Irrigation water resources are groundwater with about 800 ppm and the cost of pumping is in the range of 7 fils/m<sup>3</sup>.

Three other irrigation projects are under execution.

Soil studies have included soil content, leaching requirements, soil pH, infiltration rate, hydraulic conductivity, gypsum requirement and drainability of the soil. The results obtained were promising. The salt content of the soil was reduced from 40 mmhos/cm to less than 4 mmhos/cm.

In all the studies, the water used for irrigation at the site was used for the leaching trials.

Five pilot farms have been established and further reclamation work is presently being carried out. Gypsum, farm manure and sulphur are used.

Although the area of Jordan is relatively large, the water resources are insufficient for the population of the country. This hampers the development of agriculture. Competition for the use of water between municipal needs and irrigation purposes is arising at present. A shift in water use in some agricultural projects to meet municipal needs is expected to be made by the summer of 1971. As a matter of fact, such a shift took place last summer and water was pumped to the Irbid City for municipal use which resulted in the drying up of all vegetables on about 2 000 donums in the Wadi Duhlel irrigation project.

Consequently, the major problem of Jordan is the best use of water at the proper time. Water use for leaching should be done in the winter; the supply of water to cities, especially in the summer, should not be ignored and the maximum yield per water unit should always be the goal of the authorities.