

Spate irrigation in Egypt

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Agriculture in Egypt is irrigated mainly by Nile water. Some areas, mainly the north-west coastal region and Sinai Peninsula, depend on spate water for irrigation. The following is an overview of each location and of activities carried out concerning the use and management of spate water.

1. North-west coastal region

The north-west coastal region runs some 500 km along the Mediterranean from west of Alexandria to the Libyan border. The region is narrow, varying from 5 to 40 km wide. The region is bounded in the north by the Mediterranean sea and in the south by an escarpment 200 m high. The general slope of the region runs from south to north.

Large areas of land form a series of depressions surrounded by low hills. These areas are dissected by many intermittent stream beds (wadis) flowing from south to north. (There are about 260 wadis.) Soils suitable for agriculture are found in small areas isolated by unsuitable land.

The rainfall in the region is low: only 100-150 mm per year along the coast, and decreasing sharply inland.

The population is entirely Bedouin and is estimated at 200 000. About 30 percent of the Bedouins are settled; the rest still live in tents, moving from one place to another in search of grazing. They raise sheep and goats and cultivate barley when rainfall is adequate. Semi-nomadic groups cultivate fruit trees in valleys and lowland areas where water can be harvested and utilized.

Spate water in the region is estimated at a yearly rate of 100-200 million m³. According to some field observations, the amount of spate water for some wadis could reach 2 million m³ per year. The use and management of spate water dates back to Roman times; some Roman cisterns are used to this day for water storage.

In 1960 the Egyptian government initiated a plan for the development of this region and the settlement of Bedouins. Many studies for the use and management of spate water have been carried out, some in conjunction with foreign and/or international organizations. One of the most important activities is that carried out by the World Food Programme.

There are other continuous studies for the development of the region which are based on investigations into tradi-

tional experiences and the use of new technologies which could suit the environmental conditions. Among these studies are those currently being carried out in cooperation with FAO and ICARDA.

The following are some of the achievements of the governmental efforts in this region:

- a) about 80 percent of the spate water is now under control as a result of suitable dykes and dams;
- b) dykes and dams are constructed which intercept spate water for direct cultivation. The spate water from some wadis is diverted to other areas potentially suitable for agriculture using diverted dykes (there are more than 6 million m³ of these);
- c) many of the old water reservoirs (cisterns) have been cleaned. New cisterns have also been built, either by the traditional method, or using concrete (there are now more than 20 000 cisterns with a total capacity of about 6 million m³);
- d) the above activities result in the underground water being recharged and improved in quality; this leads to an expansion in the use of this water;
- e) improving the range land by constructing contour earth dams (water harvesting) for better water distribution;
- f) selecting and distributing crop varieties suited to the prevailing environmental conditions, such as barley (300 000 acres/year), and tree seedlings, i.e. olives and figs (more than a million trees were cultivated from 1980-1985);
- g) distributing agricultural inputs on credit and marketing agricultural products through co-operatives in each village which are branches of a central co-operative system in the region;
- h) setting up extension services to advise Bedouins about the best agricultural practices for their crops;
- i) helping the Bedouins to select suitable areas for houses and cisterns, as well as giving the necessary technical engineering assistance;
- j) planning and starting the construction of the main infrastructure needed for these communities, i.e. schools, hospitals and electricity; and
- k) monitoring and evaluating the impact of the development activities on society.

2. Sinai Peninsula

The Sinai Peninsula lies between the two arms of the Red Sea, i.e. the Gulf of Aqaba and the Gulf of Suez. The Mediterranean is its northern boundary. The area of the Sinai Peninsula is about 61 000 km² which accounts for more than six percent of Egypt's territory. In the north, a giant plateau covers some two-thirds of the total land area. It gradually rises to meet the foothills of the mountains in the south. The extensive central plain of Wadi el-Arish (about 22 000 km², one third of the total area) is dotted by island-like outcrops.

In the northern or Mediterranean region of low relief, the climate in winter is unstable with relatively high rainfall (125 mm); in summer it is dry and intensely hot. The population of Sinai totals some 175 000 of which approximately half are Bedouins. In North Sinai, the majority of the Bedouins work in agriculture, especially in Wadi el-Arish. In the other areas, Bedouins are herdsmen. The spate water in Wadi el-Arish runs from south to north (into the Mediterranean), whereas some other wadis in south Sinai discharge their water into either the Gulf of Aqaba or the Gulf of Suez.

The use of surface water and underground water in the Sinai Peninsula by the Bedouins is as follows:

- irrigation by direct rainfall;
- use of spate water by constructing local types of dykes and dams;
- constructing retention dams to store water for irrigation; and
- irrigation by dug and drilled wells, especially in the northern part of the area.