# BISKRA ALLUVIAL VALLEY, ALGERIA*

The background information for the Biskra alluvial valley is as follows:

(a) Region: Algeria, edges of the Sahara;

(b) Geography: alluvial valley;

(c) Climate: semi-arid; rainfall, 250-400 mm. Most of the rain occurs during autumn and winter;

(d) Reservoir type: alluvial fill;

(e) Methods of investigation: electric analogue - model study.

## Ground-water reservoirs and utilization

The valley is filled by alluvial deposits of a seasonal ephemeral stream. The material is generally coarse. The principal aquifer is an unconfined alluvial deposit. The boundaries of the aquifer are well-defined. Its surface area is 5 $km^2$ and its thickness ranges from 30 to 40 m. Recharge proceeds through direct infiltration of flood waters, which occurs just a few days each year. The conditions of stream-flow in the valley are variable; the river-bed is dry during the hot seasons.

The depth of the aquifer to the water-table is 4-10 m; transmissivity coefficient (T) is 1,700 $m^2$/day; hydraulic conductivity coefficient (K) is 40 m/day; effective porosity is 20-30 per cent; total storage availability is 20-30 million $m^3$. Yearly discharge in the form of pumping and underflow is approximately 11 million $m^3$.

The pattern of pumping has increased annual recharge by 5 million $m^3$. This pattern has regularized the flow that is available for exploitation. The effect is the same as having a surface reservoir for water supply. The problem of further inducement of recharge remains.

The optimum exploitation of the aquifer has been determined through an electric analogue - model study which matches the fluctuation of the piezometric surface with the regimen of the floods. It has been shown that the daily rate of infiltration fluctuates from 3 to 5 cm, depending upon the period of the year and the amount of flood waters. The rate represents the effective infiltration ratio recharging the aquifer, and incorporated into the zone of saturation.

References:

Tixeront, J. et J. M. Daniel. Alimentation et suralimentation des nappes souterraines. Observations d'un cas de suralimentation par pompage: l'oued Biskra (Algerie), Haifa, International Association of Scientific Hydrology, 72:177-178, 1967.

* Case study No. 4 prepared by G. Castany (France).

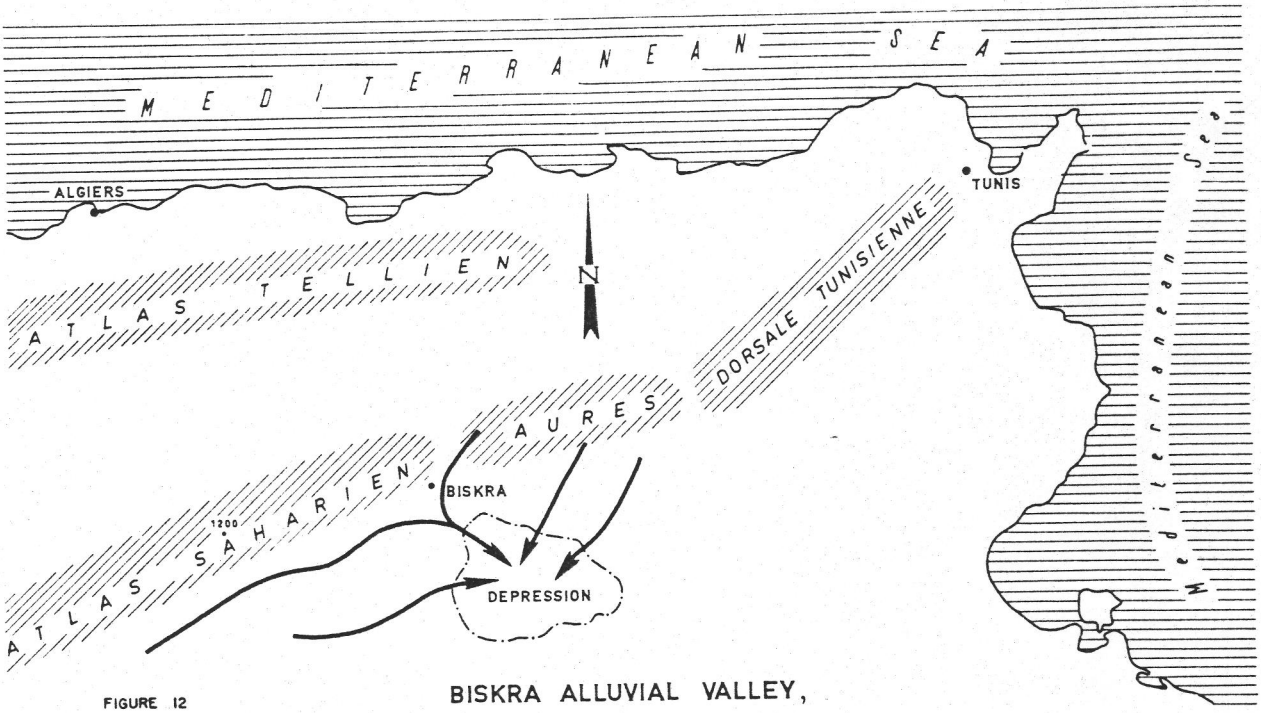
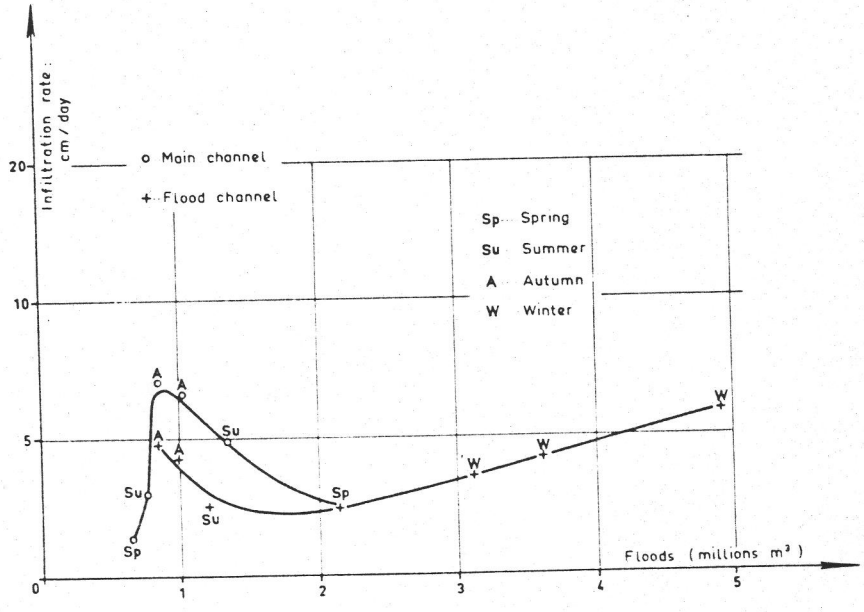



FIGURE 12

BISKRA ALLUVIAL VALLEY, ALGERIA

SCALE

0 50 100 150 200 km




CASE STUDY Nº 4