For vertical flow, a unit hydraulic gradient obtains. Thus, the flow rate decreases gradually to a constant value which is maintained until the formation of a ground water mound beneath the canal reduces the hydraulic gradient and the velocity still further. This may occur from a few days to a few weeks after water enters the canal, depending upon the soil permeability and upon the depth to the water table.

(c) Hydraulic gradient of the water surface: When the water table is at a considerable depth, water from the irrigation system moves directly downward under the action of gravity. As the water table rises, the saturated zone intersects the bottom of the canal at a relatively small angle, and a local slope away from the canal becomes superimposed on the regional slope in the general direction of movement of the underground water. At present, these slopes away from the canals and smaller channels are probably nearly at a minimum, which is just sufficient to move water from the line of the canal to the areas where it is evaporated or evapotranspired.

Construction of barrages raised the level of river waters and increased the underground hydraulic gradients normal to the river channels, thereby increasing both the contributions of the river to the water table and the rate of evapotranspiration by widening the zone in which this could occur.

3. The amount of leakage in an irrigation system depends, in part, on the proportion of the time during which the canals are filled; hence, contributions to the water table from perennial canals are greater than from non-perennial and inundation canals. Over the past fifty years, inundation canals have gradually been converted to perennial canals by the construction of barrages. The increased diversions and the lengthening of the time in which the canals were filled undoubtedly increased canal seepage and accelerated the rise of the water table.

To summarize, when the irrigation system began operating, the water table was deep and evaporation from the water table was small; leakage rates from the canals were high, and hydraulic gradients away from the canals were at a maximum. Today, the water table is everywhere much closer to the surface, seepage rates from the system are low, gradients are at a minimum, and capillary movement of water in an upward direction from the water table is an important factor of the salination process.