

As the water level is lowered, losses from evaporation and transpiration decline. The amount of water represented in the decline must appear in the pump discharge if the lowering is to continue. Moreover, a dynamic and not a static situation exists in the early phases of the dewatering process. With water tables close to the surface and with a high degree of saturation in the aquifer, reactions are quick and of large magnitude. Precipitation may cause a rapid temporary rise in the water table. Also the question of whether the water will simply be recirculated by the pump must be answered.

In the analogue computer simulation of ground water flow in the ten-mile strip, the ten wells were pumped at a rate of 8.6 million gallons per day, which corresponds to 1.5 cubic feet per year per square foot; this rate is about the same as that contemplated in the Panel plan. The aquifer was assumed to have a transmissibility of 200,000 gpd per foot and a storage coefficient of 0.2. No lateral flow occurred at the sides of the strip. The strip may be conceived as an element of a large rectangular tubewell grid in a homogeneous aquifer between two parallel canals 10 miles apart. Six cases were investigated as follows:

Case	Pumping time, years	Total recharge rate, 10^6 gpd	Canal recharge 10^6 gpd	Areal recharge 10^6 gpd
O	2	0	0	0
N	2	2	1	1
M	2	5.90	2.84	3.06
O'	20	0	0	0
N'	20	2	1	1
M'	20	5.90	2.84	3.06

Graphs showing the history of watertable drawdowns at 8 points near the center of the strip for cases O' and M' are given in Figures 7.9 and 7.10. In Figure 7.11 the profiles of the watertable along the half-strip for the six cases are drawn. All profiles are relatively flat; even cases M and M' with heavy recharge from the canals have slopes of less than 12 percent. The ratio of the recharge rate to the pumping rate of $1.03/1.50 = 0.69$ is larger than that envisaged in our plan of $0.72/1.55 = 0.46$. Therefore it may be concluded that the tubewell dewatering process on the scale and intensity delineated in our plan will be effective even in regions adjacent to large canals.

Analysis of a Model of a Five Hundred-Well Project in Chaj Doab

A second analogue computer investigation was made of a hypothetical 500-square mile tubewell project in the east central part of Chaj Doab on the north Indus Plain. The project area extended along the northern bank of the