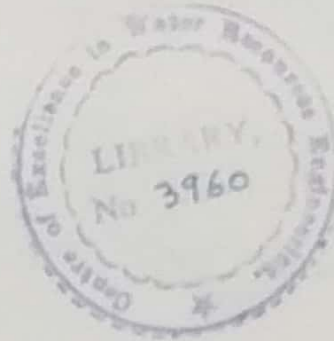


"TREND AND CAUSES OF CHANGES IN CHEMICAL  
QUALITY OF GROUND WATER IN SCARP-I"

BY



AZMAT BEG

M.Sc. (HONS) AGRI:

FOR THE DEGREE OF MASTER OF PHILOSOPHY  
IN WATER RESOURCES MANAGEMENT

CENTRE OF EXCELLENCE IN WATER RESOURCES ENGINEERING,  
UNIVERSITY OF ENGINEERING AND TECHNOLOGY,  
LAHORE

DECEMBER 1989.

ABSTRACT

To combat the menace of waterlogging and salinity more than 2000 tubewells were installed by WAPDA in SCARP-I area during 1957-60. Soon after their commissioning it was found that the water quality of the tubewells was deteriorating and more than 100 tubewells were permanently closed down on account of drastic changes in their water quality.

The study entitled "Trend and causes of changes in chemical quality of groundwater in SCARP-I" area was undertaken to determine the trend and ascertain the causes of water quality changes which occurred in the project area during a span of 25 years of its operation. This study involved the comparing of the water quality data at the beginning of the project period with those of the latest sampling.

When water quality data pertaining to the first and the latest sampling are compared on the basis of percent change it is found that there is large scale deterioration in water quality with respect to all water quality parameters (EC, RSC, and SAR). However, when same data are used to see the shifting within water quality suitability classes (usable, marginal & hazardous) only 20% tubewells have shifted from better to poor quality categories.

It is found that generally shifting from better to poor class is due to change in RSC which increased due to increase in  $\text{HCO}_3$  ion content. Lithology of wells strata had played major role in water quality changes. Deteriorating wells contain different layers of clay which are main source of soluble salts. The tubewells installed in coarse formation have shown improvement or no change in their water quality.

Both improving and deteriorating trends are prevailing side by side in the project area and some tubewells though located close to each other, are behaving differently, which shows the high heterogeneity of the aquifer with respect to mineralogy and lithology.