

**A STUDY ON DISPOSITION OF AQUIFER SYSTEM, CHEMICAL
QUALITY VARIATION AND SCOPE FOR FURTHER GROUNDWATER
DEVELOPMENT IN KANPUR DISTRICT, UTTAR PRADESH**

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ABSTRACT

With the growing demand of water, for irrigational, domestic and industrial use rapid development in growth of tubewells has taken place over the entire district in the past two decades. The vertical variation in chemical quality of ground water has rendered many tubewells a failure due to poor quality. This requires a review of the available subsurface data and study of the hydrochemical behaviour of the ground waters present in different aquifers at depth. The present paper mainly deals with the disposition of aquifer system, chemical quality variation and scope for further ground water development in the district.

For the present study the available informations from fifteen exploratory tubewells and about twenty deposit wells constructed by CGWB have been thoroughly examined and the aquifer geometry down to the depth of 500 to 590 m. below the ground level has been deciphered. With the help of available electric logs of the boreholes drilled the quality of groundwater at different depths has been interpreted. The study made brings out a clear picture of the existing aquifers over the district and the hydrochemical behaviour of the ground water at depths. The results of the study shall be of immense help in designing future tube wells to yield fresh ground water for utilisation.

The study indicates that broadly three tier aquifer system exists in Kanpur district down to the depth of 500 to 590 m. below ground level. The top aquifer consisting 120 m. and it contains fresh ground water. The aquifer is capable of providing low to moderate yield and is being exploited extensively through shallow tubewells and private minor irrigation works. Further scope of exploitation of this aquifer needs critical review. The second group of aquifer occurs between the depth range of 125 to 250 m. below ground level. This aquifer system contains for human consumption. The third group of aquifer occurring below the depth of 250 m. from the ground level consists of coarser sediments and form the potential zone containing fresh ground water. This third group of aquifer may be successfully exploited through deep tubewells over the entire district to meet the domestic and irrigational requirement provided cement sealing is done in the clay zone occurring between the second and third aquifers in order to avoid contamination of inferior quality of water from the former aquifer. It has been observed that tubewells constructed without providing cement seal has started yielding inferior quality of water. The results of exploratory drilling show that this aquifer is capable of yielding 30 to 60 lps water at a drawdown ranging between 3 to 20 m.

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