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# FRESH/SALINE WATER INTERFACE STUDIES ALONG THE KERALA COAST BETWEEN KAPPIL AND CHAKKAI USING GEOCHEMICAL AND GEOPHYSICAL METHODS

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## Abstract

Hydrochemical analysis and geophysical survey were carried out for fresh/saline water interface study from Kappil in the north to Chakkai coast in the south of Kerala state. In order to analyse the sea water intrusion phenomenon, resistivity survey was carried out along several traverses perpendicular to the coast to derive the geoelectrical parameters, which were interpreted in terms of resistivity. Seventy six Vertical Electrical Soundings (VES) and fifteen line kilometer Wenner resistivity profiling were carried out along E-W traverses using Sweden make Terrameter SAS $30^0$C instrument during the summer prior to the monsoon. Ground water samples were also collected along the same surveyed traverses and chemical analysis of water samples were done for the EC (electrical conductivity), Na, Ca, $HCO_3$, Mg and chloride concentrations. The chemical results were utilized to validate the findings of resistivity survey.

The study has shown that the ground water quality is poor in the narrow stretch of land in between the coast and the backwaters especially in Pudukurichi areas as evidenced by higher electrical conductivity of water samples in the range of 4000 microseimens/cm at $25^0$C and very low resistivity of less than 8 ohm-m. Further, during pre-monsoon, sea water enters through the coastal inlet into the backwaters. The mixed up water percolates down affecting the ground water quality of the wells located along the fringes of the backwaters especially Pudukurichi, Matanvila and Anjengo coasts. In some areas along the coast, overpumping of wells has led to the reversal of hydraulic gradient leading to sea water intrusion.

*Keywords*: Resistivity survey, Geochemical analysis, Sea water intrusion, Kerala coast.