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ELECTRICAL RESISTIVITY TOMOGRAPHY FOR GROUNDWATER POTENTIAL AND RECHARGE ZONES INVESTIGATION IN HARD ROCKS OF OTTAPIDARAM TALUK, THOOTHUKUDI DISTRICT, TAMIL NADU, INDIA

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Abstract

Ottapidaram taluk inThoothukudi district, Tamil Nadu is one of the regions where dependency on groundwater is high for domestic and irrigation activities. Increasing number of groundwater discharge wells have resulted in lowering of the water table and in many places,wells go dry during summer. At this juncture, identifying potential zones of water bearing formations and confirm the site suitability for artificial recharge is necessary for economic development. As geophysical methods play a vital role,Electrical Resistivity Tomography (ERT) method has been applied to identify water bearing formations in this study. ERT was conducted in three villages-Jagaveerapandiapuram, Kumarettiyapuram and Meenachipuram in Ottapidaram taluk where agriculture is the major occupation. Hornblende-biotite gneiss of Archean age is the major rock type and the aquifer condition is unconfined. SYSCOL JUNIOR Switch-48 model resistivity meter was used by applying Wenner & Schlumberger configuration. A total of 48 electrodes were arranged with an interspacing of 3m and the maximum depth investigated was 26m. The resistivity data were interpreted and inverted as resistivity models by using RES2DINV software. The resistivity model has shown variation of resistivity from less than 3 Ohm m to 1391 Ohm m with representationof four layer geoelectric sections. The resistivity value range from 60 to 170 Ohm m wasconsidered for delineating prospective groundwater bearing zones in Jagaveerapandiapuram and Kumarettiyapuramas these locations are favourable for groundwater recharge.

Keywords: Electrical Resistivity Tomography, Groundwater Potential, Groundwater Recharge, Ottapidaram Taluk