

Characterization of Groundwater Potential Zones from a Tropical River Basin, Southern Western Ghats, India

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Abstract

The increasing demands for groundwater resources and marked changes in climate over the years have imposed immense pressure on global groundwater resources. The present study has been undertaken to emphasize the expediency of remote sensing and geographic information system (GIS) to delineate the groundwater potential of a small tropical river basin of Kerala (India), viz., Thuthapuzha River Basin. A total of 10 geo-environmental thematic layers such as Geology, Geomorphology, Drainage density, Rainfall, Soil, Slope, Topographic Position Index, Groundwater level and Curvature were prepared and studied for groundwater potential zone demarcation. Weights assigned to each class in all the thematic maps are based on their characteristics and water potential capacity through Weighed overlay method (WoM). The groundwater potential zone map subsequently obtained was classified into five classes-very high, high, moderate, low and very low. The study reveals that about 63% of the river basin is covered under a moderate groundwater potential zone. The low and high groundwater potential zones are observed at 27% and 9%, respectively. The area under very high and very low potential zones is recorded only in very limited areas (>1%) in the basin.

Keywords: Groundwater Potential Zone; Weighed Overlay Method (WoM); GIS; Thuthapuzha River; Kerala

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