

## **Groundwater potential zoning by remote sensing, GIS and MCDM techniques: a case study of eastern India**

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**Abstract** The main intent of the present study is to highlight the role of RS (remote sensing), GIS (geographic information system) and MCDM (multicriteria decision making) in identifying groundwater potential zones in the Bankura district of West Bengal, eastern India. Remote sensing data and available conventional maps have been used to generate thematic layers for: geology, geomorphology, land use/land cover, drainage density, soil, slope, lineament density and proximity to surface water bodies, using GIS software. All these thematic layers were standardized using fuzzy logic, and weights were assigned to thematic layers according to their relative influence on groundwater occurrence. The assigned weights were normalized using Saaty's analytic hierarchy process (AHP). Finally, all thematic layers were integrated in a GIS environment to generate a groundwater potential map. Thus, four groundwater potential zones were identified, viz., "good" (23% of study area), "moderate" (29%), "poor" (20%) and "very poor" (28%). It is concluded that RS, GIS and MCDM are very useful tools for delineating groundwater potential zones in an area/basin, especially under data-scarce conditions.

**Key words** groundwater potential; remote sensing; GIS; multicriteria decision making; eastern India