

# **integrated approach for demarcation of groundwater prospective zones in hard rock terrain – through remote sensing and GIS techniques**

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The increasing growth in population and developmental activities necessitate the increase in demands of water for domestic, irrigational and industrial needs. Also, the complex nature of occurrence and movement of groundwater in hard rock terrain calls for adopting suitable techniques to demarcate groundwater prospective zones.

In order to demonstrate the efficacy of remote sensing and GIS techniques in ground water developmental studies, a study was attempted for Kusi Halla drainage basin, one of the minor basins of Bhadra river located in Chikmagalur district, Karnataka State, India. Digital Image Processing techniques such as Contrast Stretching, Principle Component Analysis, Intensity-Hue-Saturation etc, have been used to extract the relevant information pertaining to identifying groundwater prospective zones. Different thematic maps such as geology, geological structures, landforms, landuse/cover were prepared on 1:50,000 scale using IRS-1C LISS-III data. The other thematic maps such as drainage density, slope and soils were prepared from the data collected by conventional methods. The details contained in the thematic layers were categorized with respect to groundwater control. All the thematic layers were integrated in GIS environments using a model to derive probable groundwater prospective zones. Thus the integrated approach of remote sensing and Digital Image Processing techniques clubbed with GIS has helped in narrowing down the areas for groundwater exploration development.