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Evaluation of Hydrogeology of the Lower Son Valley Based on Remote Sensing Data

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ABSTRACT

Remote sensing, one of the most important reconnaissance and feature identifying tools generally applied for surface and groundwater investigation, was used for water resources mapping for the lower Son Valley in this study. The mapping was done with the help of Indian Remote Sensing (IRS) satellite imagery IRS-LISS- 1-B1 for January 29, 1991 obtained during the day transit time. The area under study comprises adjoining parts of Uttar Pradesh and Bihar states of India and extends over the seven districts, namely Bhojpur, Rohtas, Patna, Jahanabad, Aurangabad, Ballia and Chapra. Geology of the study area is quite complex, tectonically disturbed and shows four major cycles of depositions after erosions during last one billion years (since Cretaceous). Two lineaments mapped by GSI (Geological Survey of India) in western side of river Son in the Bhojpur district can also be identified by the satellite imagery. In the present study, apart from these lineaments, two new lineaments have been investigated, which run almost parallel to river Ganga in northwest parts of the area in Ballia district. The lineaments may play a very vital role in groundwater monitoring in the area. The detailed study of geomorphology, vegetation and geology of the Lower Son valley on the basis of photo-interpretation techniques for surface features, drainage pattern and density, and drainage texture has been carried out to determine alluvial type, permeability, tributary, etc. These studies and Darcy velocity analysis show that the prospect of water is very good for entire lower Son valley. The Bhojpur district is most prospective for groundwater exploitation.

KEYWORDS

Lower Son Valley, Groundwater Monitoring, Satellite Imageries, Vindhyan Super Group of Kaimur Series, Lineaments, Drainage Analysis

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