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Assessment of groundwater vulnerability to pollution in the urbanized environment in Hoskote Taluk of Bengaluru district.

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Abstract

The main objective of this study was to assess aquifer vulnerability usinga modified DRASTIC model (DRASTICA) to develop vulnerability mapping in Hoskote taluk, Bengaluru. Here, ERDAS IMAGINE software and ArcGIS software are used. The DRASTIC parameters, such as depth of water level (D), recharge (R), aquifer media (A), soil media (S), topography (T), impact of vadose zone (I), hydraulic conductivity (C) were all referred. In 'DRASTICA' 'A' refers to a new parameter called impact of anthropogenic activities (A) to access the human impact on the groundwater resources in the study area. Step by step basic data was collected, that is satellite data, population density, water level, recharge, borehole data, soil data and digital elevation model (DEM). The original 'DRASTIC' model was altered by including anthropogenic impact (A) using analytical hierarchy process (AHP) which is used for determining the ratings of each parameter in the modified-DRASTIC method and was processed in GIS to generate groundwater vulnerable zones. As GIS enables the visual interpretation of data, this has given specific maps for specific analysis and as a result, 80% of the study lies under very high vulnerable zone while in other areas, the potential for pollution is comparatively less. Spatial analysis indicated that anthropogenic impact influenced pollution, thereby human activities has to be addressed. It was observed that the modified 'DRASTICA' model is more suitable and precise for the present study.

Keywords:
Groundwater vulnerability, DRASTICA model, ARC GIS, Hoskote taluk

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