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Study of groundwater vulnerability to pollution using the DRASTIC method coupled with a geographic information system (GIS): application to groundwater Beni Amir, Morocco

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Fresh water is the condition of all life on Earth for its vital role in the survival of living beings and in the social, economic and technological development. The Groundwater, as the surface water, is increasingly threatened by agricultural and industrial pollution. In this respect, the groundwater vulnerability assessment to pollution is a very valuable tool for resource protection, management of its quality and uses it in a sustainable way.
The main objective of this study is the evaluation of groundwater vulnerability to pollution of the study area, Beni Amir, located in the first irrigated perimeter of Morocco, Tadla, using the DRASTIC method (depth to water, net recharge, aquifer media, soil media, Topography, impact of Vadose zone and hydraulic conductivity), and assessing the impact of each parameter on the DRASTIC vulnerability index by a sensitivity analysis. This study also highlights the role of geographic information systems (GIS) in assessing vulnerability.
The Vulnerability index is calculated as the sum of product of ratings and weights assigned to each of the parameter DRASTIC. The results revealed four vulnerability classes, 7% of the study area has a high vulnerability, 31% are moderately vulnerable, 57% have a low vulnerability and 5% are of very low vulnerability.