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The coupling of a geographic information system and remote sensing data to identify the potential of dam sites in arid to semi-arid zones: The Rheraya basin (High Atlas, Morocco).

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Arid to semi-arid regions are characterized by low levels of surface water and low annual precipitation (generally <350 mm/year). In such area, the Rheraya catchment (225km) located in the High Atlas Mountains of Morocco, south of Marrakech city, with altitudes ranging from 1084 to 4167 m. The objectives of this study set out a methodology that will allow decision-makers in the water sector to choose dam sites. Therefore, we used available data such as the geological map, the hydrographic network, the digital elevation model (DEM Resolution 8m), the Sentinel 2a Satellite Imagery and the rainfall measurement mission data in tropical rainfall. (TRMM) to achieve the goals set.
The empirical model is used to identify suitable sites for dam locations in the Tensift watershed using GIS and Remote Sensing systems. The study area presents various land cover, geomorphological, geological, hydrological, climatic and hydrogeological conditions. The parameters that have a significant impact on the potential choice of dams are slope, lithology, soils, Landuse landcover, precipitation, hydrographic typology, density of lineaments. The resulting map of water accumulation suitability sites in the watershed of the study area is classified into 5 classes via ArcGIS 10.3; reject, moderate, good, very good and excellent fit. From the point of view of water recovery methods, areas unsuitable for surface water collection methods and dam projects are suitable for groundwater recharge.
Keywords:
Dam, Remote Sensing, GIS, TRMM, and DEM.