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CHOICE OF SITE AND RANKING ELEMENTARY WATERSHED FOR HYDRAULIC EQUIPMENT USED FOR IRRIGATION APPLICATIONS TO THE TERRITORY OF WILAYA OF MOSTAGANEM ALGERIA

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Abstract

The selection of the favourite elementary watershed for a hill reservoir needs the association of all the essential criteria and all the interested decision makers. A geographical information system (GIS) is a strong tool for studying spatial data but it does not offer an appropriate decision making methodology. Due to their spatial aggregation functions, Multicriteria Analysis (MCA) methods can simplify decision making in situations where various solutions are available, and when several criteria have to be considered and decision-makers are not in accord. Nevertheless, they often do not consider the spatial reference of the data. Therefore, the use of GIS and multicriteria methods generate a forceful spatial decision making system. The approach is tested on the selection of hill reservoirs established in the territory of the Wilaya of Mostaganem in Northern Algeria. The approach covers the following points: determination of the criteria by the use of open source GIS tool SAGAGIS and evaluation of the hierarchy of alternatives through a tool specialized in AMC (D-Sight software, developed by laboratories coded SMG, ULB) by applying algorithms PROMETHEE-GAIA thereafter the AHP method was applied. The consistency of results confirms the effectiveness of the followed approach. This research contributes to help decision makers to rank elementary watersheds drained by the main hydrographic streams of the study area for the establishment of hydraulic equipment in our case «hill reservoirs».

Key words: decision maker, elementary sub-watershed, hill reservoir, multicriteria, PROMETHEE-GAIA, AHP, ranking technology

Received: February, 2013; Revised final: August, 2014; Accepted: September, 2014; Published in final edited form: May, 2018
