Integrated application of cluster and multicriterion analysis for ranking water resources planning strategies: a case study in Spain

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ABSTRACT

Integrated application of cluster analysis and Multicriterion Decision-Making (MCDM) is employed for the case study of the Flumen Monegros irrigation area in the Huesca province of Spain. Economic, environmental and social criteria are used to rank alternative strategies. Alternative strategies are formulated by mixing factors such as irrigation systems, water pricing, water allocation, crop distribution, fertiliser use and subsidies received. Cluster analysis is employed to reduce the large size payoff matrix to a manageable subset for further use of the MCDM technique. ELECTRE-3, an MCDM technique of outranking nature, is employed to rank the alternative strategies. The Kendall rank correlation coefficient is employed here to analyse the correlation between the ranking patterns obtained from various scenarios. Results indicate that three representative strategies are to be preferred based on this analysis.

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