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Contribution of the Multi-attribute Value Theory to conflict resolution in groundwater management. Application to the Mancha Oriental system (Spain)

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The implementation of the EU Water Framework Directive, with consideration of environmental, economic and social objectives, claims for participatory water resource management methods. To deal with different conflicting objectives it is necessary to apply a method for clarifying stakeholders' positions (identifying values and opinions of stakeholders, and quantifying their valuations), improving transparency with respect to outcomes of alternatives, and moving the discussion from alternatives towards fundamental objectives (value-thinking approach) and valuing trade-offs, facilitating negotiation. The method allows the incorporation of stakeholders in the planning process, which should guarantee a higher acceptance of the policies to be implemented. This research has been conducted in the Mancha Oriental groundwater system Spain, subject to an intensive use of groundwater for irrigation. The main goals according to the WFD are: a good qualitative and quantitative status of the aquifer and a good quantitative and ecological status of related surface water resources (mainly the Jucar river and dependent ecosystems). The aim is to analyze the contribution of the MAVT for conflict resolution and a sustainable groundwater management, involving the stakeholders in the valuation process. A complex set of objectives and attributes has been defined. The alternatives have been evaluated according to the compliance of ecological, economic and social interests. Results show that the acceptation of alternatives depends strongly on the combination of measures and the implementation status. A high conflict potential is expected from alternatives consisting of one unique measure. Uncertainties of the results are notable, but do not influence heavily on the alternative ranking. Different future scenarios also influence on the preference of alternatives. For instance, an expected reduction of future groundwater resources by climate change increases the conflict potential, with two observed reactions: acceptance of more rigorous measures, on one hand, and a tendency to soft measures with the same cost, as a reaction to the decreased effectiveness of the alternatives. The implementation of the method to a very complex case study, with many conflicting objectives and alternatives and uncertain outcomes, including future scenarios (climate change) illustrate the potential of the method for supporting management decisions.