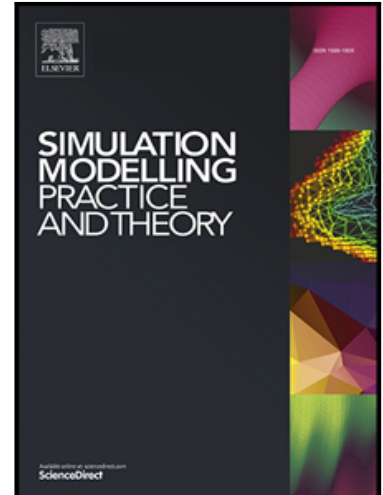


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Using the Agent-based Model to Simulate and Evaluate the Interaction Effects of Agent Behaviors on Groundwater Resources, A Case Study of a Sub-basin in the Zayandehroud River Basin



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Using the Agent-based Model to Simulate and Evaluate the Interaction Effects of Agent Behaviors on Groundwater Resources, A Case Study of a Sub-basin in the Zayandehroud River Basin

Sayed Ali Ohab-Yazdi¹ and Azadeh Ahmadi^{2*}

Abstract

The present study aims to identify and assess the parameters affecting agent behaviors and to simulate their effects on groundwater resources under the existing water regulations and policies. For this purpose, agent-based models are exploited to simulate the different groups of agents including Regional Water Authority, Public Prosecutor's Office, and the stakeholders as well as their interactions. The systems dynamic model is employed to investigate the effects of changes in agent behaviors on groundwater resources. The Any Logic software package is also used as a powerful tool for simulating both models and identifying the relationships between human behavior and water resources. Two efficient and inefficient scenarios are defined for assessing the effects of such parameters as 'meetings of regional water agencies held with other public organizations'. Results revealed that changes in the behavior and interactions of Regional Water Authority with other public organizations under the first (inefficient) scenario led to increased renewable storage by 11.6 MCM while elimination of this parameter in the second (efficient) scenario led to a decrease of 52.6 MCM in renewable storage. Results of both scenarios showed that proper interactions of the Regional Water Authority with other stakeholders led to the control of illegal water abstractions and the rise of water table in the aquifers from the scenario

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