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Agent-based modelling: a new approach for bridging the gap between design and use of models in water management?

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Agent-based modelling: a new approach for bridging the gap between design and use of models in water management?

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In order to cope with the challenges ahead, water management has to become more flexible and adaptive. Consequently, improved tools are necessary for augmenting and supporting the human decision-making in water management. Agent-based models are possibly a valuable approach for the development of such tools, for example because of their relative high user friendliness. However, it is not likely that the application of a new technology achieves to overcome all the obstacles hindering possible end-users from actively using the developed tools. The question remains what makes an ABM suitable and useful for water management. Answering this question requires discussing some of the qualities of agent-based models first, for example the following ones:

- In which part of the modelling process should the stakeholders be involved?
- Which specific data and knowledge is necessary to develop agent-based models in water management?
- Which possibilities exist to achieve any kind of validation for this kind of model?
- What are potential failures in creating such models?

Moreover, agent-based models can be discussed in comparison to other modelling approaches, e.g. equation-based models. Such a discussion may include the following questions:

- Which specific benefits do agent-based models have for water management?
- What are the qualities that make a system suitable for agent-based modelling?
- Which of the reasons why stakeholders in water management refuse to use environmental models apply to agent-based DSSs?

In addition, it may be beneficial to discuss interesting or new areas for further research on agent-based models for water management, e.g. coupling different approaches or the development of optimal rules for autonomous water supply.