

PhD Thesis, Water Management and Science

Title:

Identification and modelling of local stakeholders' representations for catchment management

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Summary:

In a catchment, various stakeholders exploit natural resources which they use and have to manage locally. Each of them has his own perception and way to manage the resources depending on his representation of the situation and functioning of their common system.

Companion Modelling – a participatory modelling approach focusing on co-development of models with local stakeholders – use models to integrate and share among participants the point of view of each stakeholder with the aim to support collective decision-making. For this purpose, stakeholders' representations are first identified and integrated in a Multi-Agent System. This research puts forward and tests, through its application in a Northern Thailand catchment, a methodology for formally transferring observed stakeholders' representations into a computer model. The methodology embeds elicitation techniques from knowledge engineering, and concepts from Multi-Agent Systems and situated cognition theory, while following a Companion Modelling approach. The research question is on how to combine these different tools and approaches in a consistent methodology able to grasp the complexity of the system's interactions and the heterogeneity of local stakeholders' representations.

Results show that although stakeholders' representations can be elicited, formalised and modelled through the proposed methodology, the subjective intervention of the modeller is required when it comes to define the micro-structure of the model.

Keywords: Catchment, Modelling, Multi-Agent Systems, Representations, Local Stakeholders, Knowledge Engineering, Northern Thailand