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Revisiting an interdisciplinary hydrological modelling project. A socio-hydrology (?) example from the early 2000s

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Interdisciplinary scientific and societal knowledge plays an increasingly important role in global change research. Also, in the field of water resources interdisciplinarity as well as cooperation with stakeholders from outside academia have been recognized as important. In this contribution, we revisit an integrated regional modelling system (DANUBIA), which was developed by an interdisciplinary team of researchers and relied on stakeholder participation in the framework of the GLOWA-Danube project from 2001 to 2011 (Mauser and Prasch 2016). As the model was developed before the current increase in literature on participatory modelling and interdisciplinarity, we ask how a socio-hydrology approach would have helped and in what way it would have made the work different. The present contribution firstly presents the interdisciplinary concept of DANUBIA, mainly with focus on the integration of human behaviour in a spatially explicit, process-based numerical modelling system (Roland Barthel, Janisch, Schwarz, Trifkovic, Nickel, Schulz, and Mauser 2008; R. Barthel, Nickel, Meleg, Trifkovic, and Braun 2005). Secondly, we compare the approaches to interdisciplinarity in GLOWA-Danube with concepts and ideas presented by socio-hydrology. Thirdly, we frame DANUBIA and a review of key literature on socio-hydrology in the context of a survey among hydrologists (N = 184). This discussion is used to highlight gaps and opportunities of the socio-hydrology approach.

We show that the interdisciplinary aspect of the project and the participatory process of stakeholder integration in DANUBIA were not entirely successful. However, important insights were gained and important lessons were learnt. Against the background of these experiences we feel that in its current state, socio-hydrology is still lacking a plan for knowledge integration. Moreover, we consider necessary that socio-hydrology takes into account the lessons learnt from these earlier examples of knowledge integration (see also, Hamilton, ElSawah, Guillaume, Jakeman, and Pierce 2015; Jakeman and Letcher 2003).

Our contribution attempts to close a gap between previous concepts of integration of socio-economic aspects into hydrology (typically inspired by Integrated Water Resources Management) and the new socio-hydrology approach. We suppose that socio-hydrology could benefit from widening its scope and considering previous research at the boundaries between hydrology and social sciences. At the same time, concepts developed prior to socio-hydrology were seldom entirely successful. It might be beneficial to review these approaches developed earlier and those that are being developed in parallel from the perspective of socio-hydrology.

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