



Interactive modelling with stakeholders in two cases in flood management

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New policies on flood management called Multi-Level Safety (MLS), demand for an integral and collaborative approach. The goal of MLS is to minimize flood risks by a coherent package of protection measures, crisis management and flood resilience measures. To achieve this, various stakeholders, such as water boards, municipalities and provinces, have to collaborate in composing these measures. Besides the many advances this integral and collaborative approach gives, the decision-making environment becomes also more complex. Participants have to consider more criteria than they used to do and have to take a wide network of participants into account, all with specific perspectives, cultures and preferences.

In response, sophisticated models are developed to support decision-makers in grasping this complexity. These models provide predictions of flood events and offer the opportunity to test the effectiveness of various measures under different criteria. Recent model advances in computation speed and model flexibility allow stakeholders to directly interact with a hydrological hydraulic model during meetings. Besides a better understanding of the decision content, these interactive models are supposed to support the incorporation of stakeholder knowledge in modelling and to support mutual understanding of different perspectives of stakeholders

To explore the support of interactive modelling in integral and collaborative policies, such as MLS, we tested a prototype of an interactive flood model (3Di) with respect to a conventional model (Sobek) in two cases. The two cases included the designing of flood protection measures in Amsterdam and a flood event exercise in Delft.

These case studies yielded two main results. First, we observed that in the exploration phase of a decision-making process, stakeholders participated actively in interactive modelling sessions. This increased the technical understanding of complex problems and the insight in the effectiveness of various integral measures. Second, when measures became more concrete, the model played a minor role, as stakeholders were still bounded to goals, responsibilities and budgets of their own organization. Model results in this phase are mainly used in a political way to maximize the goals of particular organizations.