



## How do local stakeholders respond to the uncertain implications of an innovative flood infrastructure project?

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In the 20th century, flood management was dominated by rigid structures – such as dikes and dams – which intend to strictly regulate and control water systems. Although the application of these rigid structures has been successful in the recent past, their negative implications for ecosystems and natural processes is often not properly taken into account. Therefore, flood management practices are currently moving towards more nature-inclusive approaches. Building with Nature (BwN) is such a new approach of nature-inclusive flood management in the Netherlands, which aims to utilize natural dynamics (e.g., wind and currents) and natural materials (e.g., sediment and vegetation) for the realization of effective flood infrastructure, while providing opportunities for nature development. However, the natural dynamics driving a project based on BwN design principles are inherently unpredictable. Furthermore, our factual knowledge base regarding the socio-ecological system in which the BwN initiative is implemented is incomplete. Moreover, in recent years, it is increasingly aimed for by decision-makers to involve local stakeholders in the development of promising flood management initiatives. These stakeholders and other actors involved can have diverging views regarding the project, can perceive unanticipated implications and could choose unforeseen action paths. In short, while a project based on BwN design principles – like any human intervention – definitely has implications for the socio-ecological system, both the extent to which these particular implications will occur and the response of stakeholders are highly uncertain.

In this paper, we study the Safety Buffer Oyster Dam case – a BwN pilot project – and address the interplay between the project's implications, the uncertainties regarding these implications and the action paths chosen by the local stakeholders and project team. We determine how the implications of the Safety Buffer project are viewed by local stakeholders, identify the frames and uncertainties related to these implications, and classify these uncertainties according to their nature and level. We describe which action paths are chosen by the local stakeholders and project team regarding the implications identified. Our research shows that there is a correspondence between the level of uncertainty about the implications identified and the action paths chosen by the actors involved. This suggests that the inherent deep uncertainty in projects based on BwN principles calls for more adaptable and flexible strategies to cope with the implications of these initiatives.