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

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1. Introduction to Building with Nature

Building with Nature (BwN) is an innovative water management approach with two key characteristics¹:

Use of natural materials and dynamics – such as sediment, vegetation, wind and currents – for realizing flood infrastructure projects...







...while simultaneously exploring opportunities for nature development.

2. Ambiguity and factual uncertainty in BwN

BwN seems promising, but using natural dynamics inherently adds high and often irreducible levels of factual uncertainty to a project's design process². Such uncertainties can be due to^{3,4}:

- Incompleteness of our knowledge.
- > Inherent unpredictability of the system.

However, the most important uncertainties are the ambiguous project implications that stakeholders perceive, which are interrelated with the factual uncertainty⁵ (Figure 3).

Question: Can stakeholder participation be used to cope with ambiguous implications in BwN projects?

Figure 2: Sand Engine (https://beeldbank.rws.nl, Rijkswaterstaat)

3. Different stakeholder implications in similar BwN projects

We identified the ambiguous implications of two BwN sand nourishment projects and studied if stakeholder participation is a successful strategy to cope with these ambiguities.

In the **Safety Buffer case (Figure 1)**:



- Stakeholders and project actors mostly agreed about the interpretation of the project and its effects.
- Despite ambiguity about the action path to follow, stakeholders were willing to accept the project.
- Idea was jointly developed in an earlier project with stakeholders and the actual project had an active participatory process.
- > A shared environmental problem and clear goals.

In the Sand Engine case (Figure 2):

- Several stakeholders actively questioned the project's acceptability.
- > Mainly **ambiguity about interpretation** of the project and effects.
- Idea came from governmental parties. During the actual project, stakeholder involvement was limited to 'informing'.
- > Non-specific goals and **no shared problem**.

Different types of ambiguity were identified in the two BwN projects, caused by differences in the level of stakeholder connectedness.

Figure 3: Example of a cascade of uncertainty for a BwN project

Participation seems to successfully deal with ambiguity in BwN.

Concluding remarks: Our results suggest that for a BwN initiative, creating a shared problem and clear goals are of paramount importance for the project's acceptability and success. While managing uncertainty, bridging the gaps between actors from different communities and creating mutual understanding – by actively involving stakeholders in the development process – is far more important than reducing incomplete knowledge or increasing our control over the unpredictable natural system.

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References:

De Vriend and Van Koningsveld
(2012); 2) Bergen et al. (2001); 3)
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