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Vegetated foreshores as coastal protection strategy: Coping with uncertainties and implementation

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Promising Building with Nature solutions for flood protection, such as vegetated foreshores, inherently have a dynamic nature. Therefore there is a relatively large degree of uncertainty with respect to their contribution to flood protection. This hampers innovation and the implementation of vegetated foreshores in flood risk management worldwide. We aim to develop new methods to assess how, and how much vegetated foreshores can contribute to flood risk reduction. The project will lead to a better understanding of (uncertainties in) the functioning and stability of these ecosystems and the development of novel governance arrangements. This requires integration of knowledge from ecology, biogeomorphology, hydraulic engineering, and governance.
By field observations on several sites and flume measurements we will analyse fundamental ecological and physical processes for various types of wetland vegetations. The knowledge obtained will be applied in one implementation case study for a location in the Netherlands where dike reinforcement is needed in the future. This case study integrates fundamental knowledge from all the disciplines. It is used to design governance and implementation arrangements, and to demonstrate how vegetated foreshores can contribute to flood risk reduction. The project will provide the knowledge, methods and tools (e.g. a maptable) required for the design and implementation of vegetated foreshores as a safe, ecologically desirable, and cost effective alternative in flood management. Strong cooperation with end-users from the private sector, government and non-governmental organizations is embedded in the project to enhance the implementation of our findings in practice. In the full-paper, we present a multidisciplinary research agenda how to address the uncertainties hampering application, how to develop probabilistic tools to derive failure chance in legally imposed terms and how to derive at suitable governance arrangements.