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Examining the economic viability of Nature-Based Solutions in an uncertain future

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Uncertainties of future climate and socio-economic changes add complexity to the selection of appropriate climate change adaptation measures. These measures may be perceived as optimal today to address a changing climate, but have the potential to perform poorly over their lifetimes as knowledge on global warming and socio-economic development gradually improves. Incorporating uncertainty into investment decision-making may, therefore, add substantial value to the project.

A climate change adaptation measure recently promoted are Nature-Based Solutions (NBS). Promoters of NBS point at their economic viability compared to traditional approaches to climate adaptation, such as dikes. However, evidence to support this claim is warranted.
The objectives of our research are twofold. First, we assess the net benefits of three NBS of different size compared to a traditional climate change adaptation measure (dike strengthening) under a low-emissions and a high-emissions climate scenario, taking changes in land-use practices into account. Furthermore, by applying Real Options Analysis and Bayesian Updating we analyse the value added to an NBS by waiting for updated climate and socio-economic information for six and an additional eight years. A river restoration program along the Westerwoldse Aa River in the Province of Groningen, the Netherlands, is used as a case study.

Our results show that the implementation of NBS in river restoration has the potential to be economically more attractive than the traditional approach, under both emission scenarios. Furthermore, waiting with the investment in a restoration project may considerably increase the value of a project.