

D4.5 Insurance value of ecosystem and co-benefits

EXECUTIVE SUMMARY

This document presents the synthesis of the economic assessments implemented in the NAIAD projects presented in Deliverable 6.3 (Le Coent et al., 2019). It presents the principles of the economic assessment methodology and its three main components - evaluation of cost of implementation, estimation of damages avoided thanks to NBS strategies and the valuation of co-benefits - and how it was applied in 7 NAIAD demos (Medina del Campo, Spain; Thames, United Kingdom; Lower Danube, Romania; Lez, France; Rotterdam, the Netherlands; Copenhagen, Denmark; Brague, France). The document then highlights the main results of the economic assessment of NBS strategies aiming at reducing water risks in the four demos in which a Cost-Benefit Analysis could be undertaken.

The following conclusions can be highlighted:

- The cost of implementation and maintenance of NBS strategies is lower than the cost of grey solutions for the same level of risk management. However, this conclusion may be reversed if the opportunity costs linked to land use change in urban areas is included in the economic analysis. The evaluation of opportunity cost for the use of public-owned land however remains subject to debate.
- There is a very large heterogeneity of cost-effectiveness (cost/m³ of water retention) of individual NBS measures. This information should be taken into account to design cost-effective NBS strategies, which are combinations of individual NBS measures.
- For NBS strategies aiming at the reduction of flood risks, benefits in terms of avoided damages are not sufficient throughout the demos to cover investment and maintenance costs. This conclusion however also applies to grey solutions evaluated in NAIAD even to a larger extent.
- Co-benefits represent the largest share of the value generated by NBS strategies. The value of co-benefits must therefore be integrated in the economic valuation of NBS for them to be

judged economically efficient. This conclusion must be taken into account in the design of financing instruments for NBS.

- There is no clear-cut conclusion on the overall economic efficiency of NBS throughout the demos. Lez and Medina del Campo demos reveal a positive cost-benefit analysis, while Rotterdam and Brague demos do not. It is therefore fundamental to carry out thorough case specific economic valuations of a diversity of strategies, involving NBS, grey and hybrid solutions, in order to identify the most adequate strategy for water risk management and to address territorial challenges. Our estimations are however characterized by a large uncertainty due to the multiplicity of models required and should therefore be taken with caution. In addition, the economic assessment only takes into account benefits that could be valued monetarily. Important NBS environmental and social benefits were therefore either not or partially evaluated. Taking them into account would require implementing a multi-criteria decision analysis.

This deliverable has been prepared as a working paper for publication in a scientific economic review. The style and terminology have therefore been adapted accordingly. For example, the NAIAD term "demo" has been changed to "case studies" in order to be understood by a wider audience.

