

## Flood risk management support on periodically flooded areas using nature-based solutions

### **Abstract**

Flood is the most significant natural hazard in Poland. Due to the expected increase in flood risk in the future, there is a need to investigate for new solutions to manage the dynamically changing risk. Nature-based solutions, involving natural processes occurring in nature to simultaneously reduce flood risk and protect natural ecosystems, can be an answer to meet the demand for resilient flood risk management. The effectiveness of Nature-based solutions in flood risk management has been proven in numerous studies, but despite the benefits, their implementation is bounded by numerous problems.

This dissertation addresses the issue of implementing nature-based solutions in Poland, with particular emphasis on afforestation as the main non-technical measure in flood risk management in Poland and polders, the subject of which has not been widely recognized in Polish literature so far.

Polder management in Poland has been recognized in the historical, classification, morphometric and spatial scope. The potential of polders was assessed in the field of flood risk management, intensification of agricultural production and protection of geodiversity and biodiversity. A set of barriers for the effective implementation of nature-based solutions in flood risk management was also identified. Due to the significant impact of environmental conflicts on the effectiveness of the use of Nature-based solutions, analyzes of the possibilities of reducing the occurrence of conflict situations using the game theory model were also carried out.

The main result of the study was to determine the possibility of increasing the effectiveness of flood risk management in periodically flooded areas using nature-based solutions.

Keywords: Nature-based solutions, flood risk management, polders, polder management, afforestation, decision support