

## **Abstract**

*“Possibilities of closing levee breaks in flood events from the German experience”*

Levee breaks are responsible for immense damage to life and property, and usually cause great suffering to the people living in the area. There are a number of methods to close a levee break effectively. However, these methods are dependent on a number of factors. So far, there are limited scientific studies to determine which method of closure is most suitable for any levee that breaks. With this in mind a systematic methodology and framework is developed in this study for levee break closure. Firstly, the selection options of closing a levee break is put forward using the classification and analysis of the levee breaks closures during the floods of 2002 (resulting in 17 levee breaks) and the flood of 2013 (resulting in 11 levee breaks) in Saxony-Anhalt Germany together with the gained knowledge from literature review. Secondly, significant parameters pertaining to the geometry of the levee break, installation of the closing structure, logistics resources, and stability of the closing structure, are chosen based on the measures taken for closing the levee break. Finally, the parameters are optimized based on comparative analysis using both positive and negative results, and lessons learnt for break closing are summarized. The case study of the method discussed in this paper is based on in-depth analysis from the levee break in Fischbeck, Germany in June 2013. Barges were sunk at the break sites for the closure. The analysis of this event shows that the use of barges to close the break is a suitable choice, regarding the width of the break as well as the availability of closing structures, which led to a reduction of the inflow by 60% to 70% with the first two barges, and with the use of an additional (third) barge the inflow decreased even more.