The importance of domino effects in flood risk assessments: a case study from the VNK2 project

Auteurs: W.L.A. ter Horstabc, R.B. Jongejanc

aHKV Consultants, Lelystad, The Netherlands
bVNK2 ProjectOffice, Rijkswaterstaat, Utrecht, The Netherlands
cDepartment of Civil Engineering and Geosciences, Delft University of Technology, Delft, The Netherlands
dJongejan RMC, Delft, The Netherlands

Abstract

The failure of a levee system may lead to an increase in the loads on other levee systems. The associated domino effect may strongly influence the risk of flooding. This is particularly relevant for risk assessments that are carried out for individual levee systems rather than groups of levee systems. This article presents a simplified method for including these effects in quantitative risk analyses and illustrates the importance of doing so with a case study from the Netherlands. The risk of flooding in the densely populated, western part of the country appears to be strongly influenced by domino effects. Ignoring these effects would lead us to significantly underestimate the risk of flooding. It would also lead to erroneous conclusions about the effectiveness of particular risk management actions and the efficacy of strongly differentiated safety standards.

Keywords: Flood risk, quantitative risk assessment, domino effects, system analysis


The full article can be requested at the publisher or at HKV consultants (secretariaat@hkv.nl)