

# UNESCO-IHE INSTITUTE FOR WATER EDUCATION AND SRIWIJAYA UNIVERSITY



## Impacts of Future Changes on Flood Protection Systems Case Study of Indonesia and the Netherlands in Comparative Perspective

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# **Impacts of Future Changes on Flood Protection Systems Case Study of Indonesia and the Netherlands in Comparative Perspectives**

Master of Science Thesis  
by

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## Summary

The vulnerability of flood management in a changing environment clearly needs a multidisciplinary approach and address the issue of future changes. These changes include changes in land use, climate change considering the increase of extreme rainfall and sea level rise and land subsidence. The combined impacts of future changes will certainly be disastrous consequences to overall development and lead to an autonomous increase of flood risk and pressure on the system of flood defence structures. However, the nature and scale of these impacts are dependent both on the form and scale of the land use change, the climatic characteristics and rate of subsidence of the region within which the change occur. In order to predict the trends that can be expected in the future, study of the impacts of future changes is conducted in three different areas, Delfland-Dike Ring 14, the Netherlands, Pluit Polder-Jakarta, Indonesia and Jakabaring-Palembang, Indonesia. In Delfland, man-induced changes in land use especially due to urbanisation take place at a much more rapid speed than climate change while subsidence has been controlled by relatively high polder water level. In Pluit Polder, subsidence rate has come to 5 cm/year therefore becoming a major concern than climate change, while no future land use change is accounted for the area has been fully urbanised. Jakabaring is more or less situated in between so every future changes would be considered important. This research will be carried out to study the impacts of future changes on flood protection system by analyzing the rainfall and evaporation data, cross and longitudinal sections, discharge by each drain, sea level rise and subsidence rate in the study area with the help of the DUFLOW model. Some scenarios are designed to find out to what extent it will affect the existing flood management system and finally to give the proper recommendation for future development.

Keywords: Urban flood protection system, future changes, land use change, climate change, land subsidence.