MSc thesis

Building with Nature Indonesia

Morphodynamic modelling of mangrove coast restoration

Project description

Mangrove vegetation attenuates waves, reduces erosion and enhances sediment deposition. This makes it a natural tool to combat land subsidence and relative sea level rise, provided that there is enough sediment supply in the system.

In Demak, Indonesia, mangrove removal has produced high erosion rates and flooding at the coast. Different types of brushwood and bamboo structures have been built in Demak by the Ecoshape consortium, in order recover the mangrove habitat and enhance natural colonization. The structures reduce wave energy at their lee, providing a calm environment where sediment can settle and mangrove seedlings can establish. However, the current designs were based on engineering judgment, and have provided variable success rates.

Optimizing restoration efforts requires deeper understanding of which structure designs could reproduce the mangrove habitat. The present work aims to investigate how bamboo and brushwood structures affect the morphodynamic processes.

Purpose

The purpose of the thesis is the optimization of structure designs for the Building with Nature project in Indonesia. It particularly focuses on modelling the morphodynamic effect of the structures, to determine study aspects such as the distance from the coastline, or what the timescales for coastline recovery would be under different scenarios.

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Information:

For more information about this topic you can contact:

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