

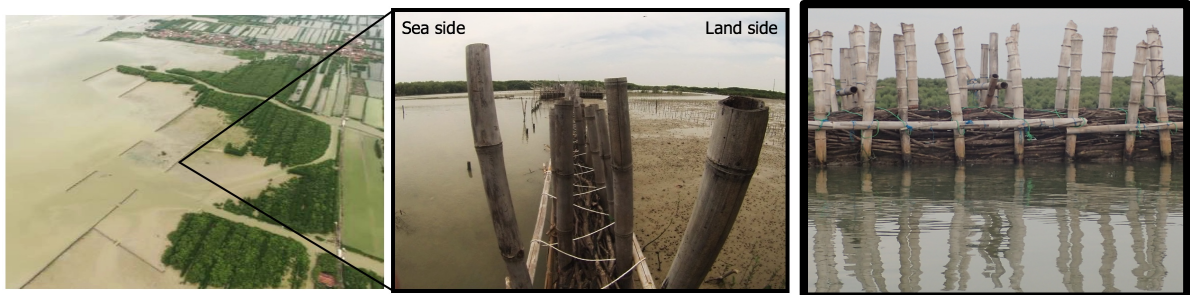
# MSc thesis

## Laboratory Experiments for Optimisation of Brushwood Structures

### Project description

Mangrove deforestation in Demak, Indonesia, has resulted in considerable erosion and flooding, with coastline retreat rates up to several kilometres.

Low tech permeable structures of bamboo and brushwood have been built to restore the mangrove habitat. The structures create a sheltered area behind them, where sediment can settle and the bed level rises. This compensates for the erosion losses and when the bed level is high enough, mangrove seeds start colonising the soil and come back to the area.

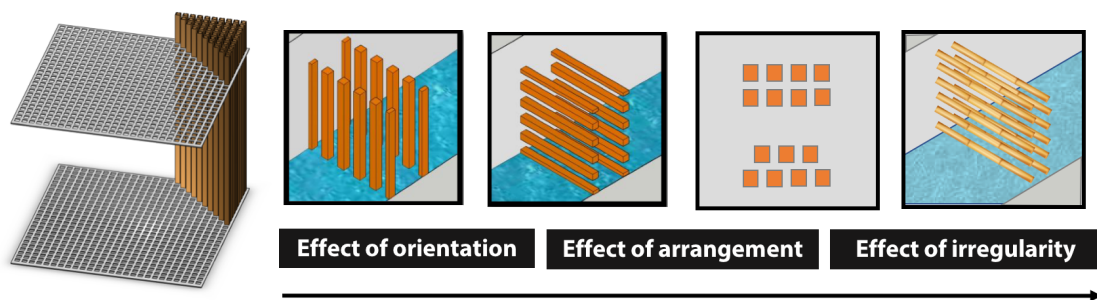


So far existing structures are based on designs used for land reclamation in the Wadden sea. A deeper scientific knowledge is required to optimize the structures and develop design guidelines.

### Laboratory experiments

Flume experiments will be conducted with schematized structures to understand better the physical processes. Wave transformation through the structure will be measured for different configurations. The flow velocities and forces on the structure will be also measured using sensors, in order to understand which physical mechanisms are dissipating the wave energy.

The complexity of the configurations will be increased in a step by step approach to analyse separately the different effects, starting with vertical regular elements and finishing with bamboo elements that resemble the real structures (as shown in the image below).



This MSc work involves conducting the experiments (using wave gages, velocimeters and force transducers), processing and analysing the data (using Matlab or Python) and with the possibility of doing some modelling using SWASH (depending on the time schedule).

Some knowledge on Fluid Mechanics courses, such as Turbulence in Hydraulics, on flow-structure interaction (loadings on cylinders, etc.), and on data processing are relevant for this MSc topic.

### Starting date:

From September 2018.

### Information:

For more information about this topic you can contact:

**Alejandra Gijón** ([A.GijonMancheno-1@tudelft.nl](mailto:A.GijonMancheno-1@tudelft.nl))

**Coen Kuiper** ([c.kuiper@tudelft.nl](mailto:c.kuiper@tudelft.nl))