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Motivation

The coast of Demak, Java, Indonesia, is degrading: 4.5km of land has been lost to sea in the last 25 years. Local villages are constantly at risk of flooding. In a joint effort TU Delft, Universitas Diponegoro and WUR are working on a solution that enables not only coastal defense, but also provides a viable business case for local fishermen and an opportunity for ecosystem restoration. Vertical poles reduce wave energy, promoting sediment accumulation and creating habitat that is suitable for mangrove recruitment, a natural coastal defense. Simultaneously, the poles are used for cultivation of native mussels, providing income for local fishermen and empowering locals to maintain the constructions. The construction also functions as an artificial reef that attracts many animals, thereby contributing to a balanced ecosystem and improved ecosystem services. In this way, **Mussels** function as **Mangrove** facilitators for **Coastal defense: MUMACO**.

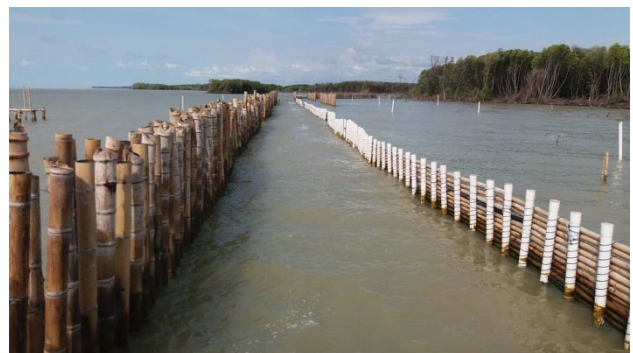
Aims and Objectives

The aim of this PhD thesis is to assess the effects that mussel-covered poles have on the local ecosystem. Pelagic, benthic and epifaunal communities will be monitored throughout the duration of the project to answer the following main research questions:

1. How will different functional groups in the local ecosystem respond to the presence of mussel-covered poles?
2. How is ecosystem productivity affected and what is the effect on ecological carrying capacity?
3. What is the added value of genomics-based biodiversity assessment in the tropics?

Method

Morphological identification of collected specimens will be supplemented with genomics-based identification of bulk samples and environmental DNA to provide a thorough overview of the expected biodiversity changes. Stable isotope and stomach content analyses will provide insights in possible food web changes. In combination with size-frequency distributions and monitoring primary production, this will indicate whether or not the ecological carrying capacity of the ecosystem is enhanced. This will all help understand the extent to which changes in biodiversity can be explained by attraction or production and can help to prevent overfishing of additionally enabled fisheries.



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Hobbies; Climbing, mountainbiking, hiking, anything outdoors.
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