

## BUILDING WITH NATURE TO RESTORE ERODED COASTS

*By enhancing natural mangrove reforestation, a safe delta coastline is built that enable vulnerable communities and economic sector to prosper*

### OVERVIEW

- Organization data :
  - ✓ Name: **EcoShape**
  - ✓ Organization type: **Public private partnership**
  - ✓ Year of foundation: **2008**
- Beneficiaries : **70 000 people**
- Donors and financing: **Waterloo Foundation, Dutch Sustainable Water Fund, International Climate Initiative, Otter Foundation, EcoShape, Indonesian government and Demak communities – 9 Million €**
- Location : **Demak, Central Java, Indonesia**
- Beginning date : **2015**
- Motivations: **Introduce more productive and sustainable land-use and be more self-reliant and resilient against hazards**



### CONTEXT AND ACTION

**Summary** | Communities in Northern Java are suffering from coastal erosion affecting hundreds of kilometers of coastline. In the district of Demak more than 3 kilometers of land including entire villages have already been swallowed up by the sea. The main causes of erosion problems are the removal of mangrove belts for aquaculture development, the construction of coastal infrastructure that disturbs sediment build-up from offshore sources, as well as river canalization and groundwater extraction, which cause land subsidence.

To solve this problem, Building with Nature project addresses these root causes integrating mangrove and river restoration, small-scale engineering and sustainable land use. The project is coordinated by some foundations, NGO and Indonesian government. Semi-permeable barriers have been built from poles and brushwood to dampen the waves and capture sediment. Once the near shore bed level rises enough, mangroves will regenerate naturally, developing a natural defense that will protect the hinterland from further erosion. Where the coastline has not yet been eroded, the conversion of ponds into mangrove forests is encouraged in close collaboration with local communities.

“Building with Nature” is a model for sustainable aquaculture that provides space for mangrove restoration and requires less use of chemicals, in order to enable vulnerable communities and economic sectors to prosper, limiting climate change migration phenomena. The measures will be controlled using community bylaws and rooted in community development plans and government master planning for sustainable development.

### Local challenges |

- Land subsidence due to unsustainable groundwater extraction and river canalization;
- Removal of mangrove belts, converted to fishponds for aquaculture;
- Sea level rise and low land topography : flooding in communities and in urban places;
- Construction of classic engineering coastal infrastructure that disturbs sediment build-up and contributes to erosion.

### Local responses |

- Build a stable restored mangrove coastline thanks to sediment capturing;
- Converting the closest ponds to the sea into mangrove belt;
- Change agricultural practices into sustainable aquaculture to increase resilience;
- Integrated water management plan and dialogues to address subsidence issues.

## BENEFITS

**Environmental |** By restoring mangrove ecosystems, its ecosystems services were recovered and local biodiversity was increased. The mangrove greenbelt regains its health. This natural defense protects seashore from further erosion, containing mud and protecting coast from wave's power. At the same time, flooding is mitigated. With mangrove belt, upper rivers also recovered their functions and created meanders, sign of the good functioning of the river.

**Social |** Restored mangrove coastline, by reducing erosion, enables local communities to adapt to sea level rise, stay safe and prosper. Moreover, farmers in Demak are trained through coastal field schools to develop, test, and implement best practices, such as generating farm inputs locally to reduce cost in an ecologically sound way.

**Economic |** The revitalization of aquaculture, main source of income for Demak inhabitants, provided sustainable livelihood and enhanced productivity. Moreover, mangrove restoration created temporary and permanent work for local people.

## SUCCESS FACTORS

- Collaboration and uptake by local, provincial and national government;
- Integrated approach by improving physical, ecological and social system;
- Active participation from communities that will take full ownership over the structures ensuring their long-term maintenance;
- Close collaboration with government, partners and other players at different policy levels: participative policy analysis.

## OBSTACLES

- Tackling root causes of local problematics;
- The level of subsidence is more severe than anticipated and has an impact on all the project objectives;
- Although the principle of permeable structures work, it remains a challenge to develop a sustainable structure from local natural material with low maintenance requirements.



« There is a building with Nature Solution for every setting, combining green and grey infrastructures in an optimal mix alongside other measures for risk reduction. »

**Fokko van der Goot, EcoShape member**

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#### ▪ Related link(s) :

<https://www.ecoshape.org/en/projects/building-with-nature-indonesia/>