# Coastal NBS in West Africa

## Factsheets

*Baseline study West African Case Studies for Coastal Nature Based Solutions*

From the 30 NBS projects identified along the West African coastline, organisations involved in seven projects were interviewed to better understand how those projects were implemented, what impacts they have had, and what lessons can be learned for the future.

WACA West Africa Coastal Areas Management Program

Netherlands Enterprise Agency

HKV

Witteveen + Bos

Factsheet 1
Dune restoration,
Mauritania

Factsheet 2
Dune restoration in
Saint Louis MPA

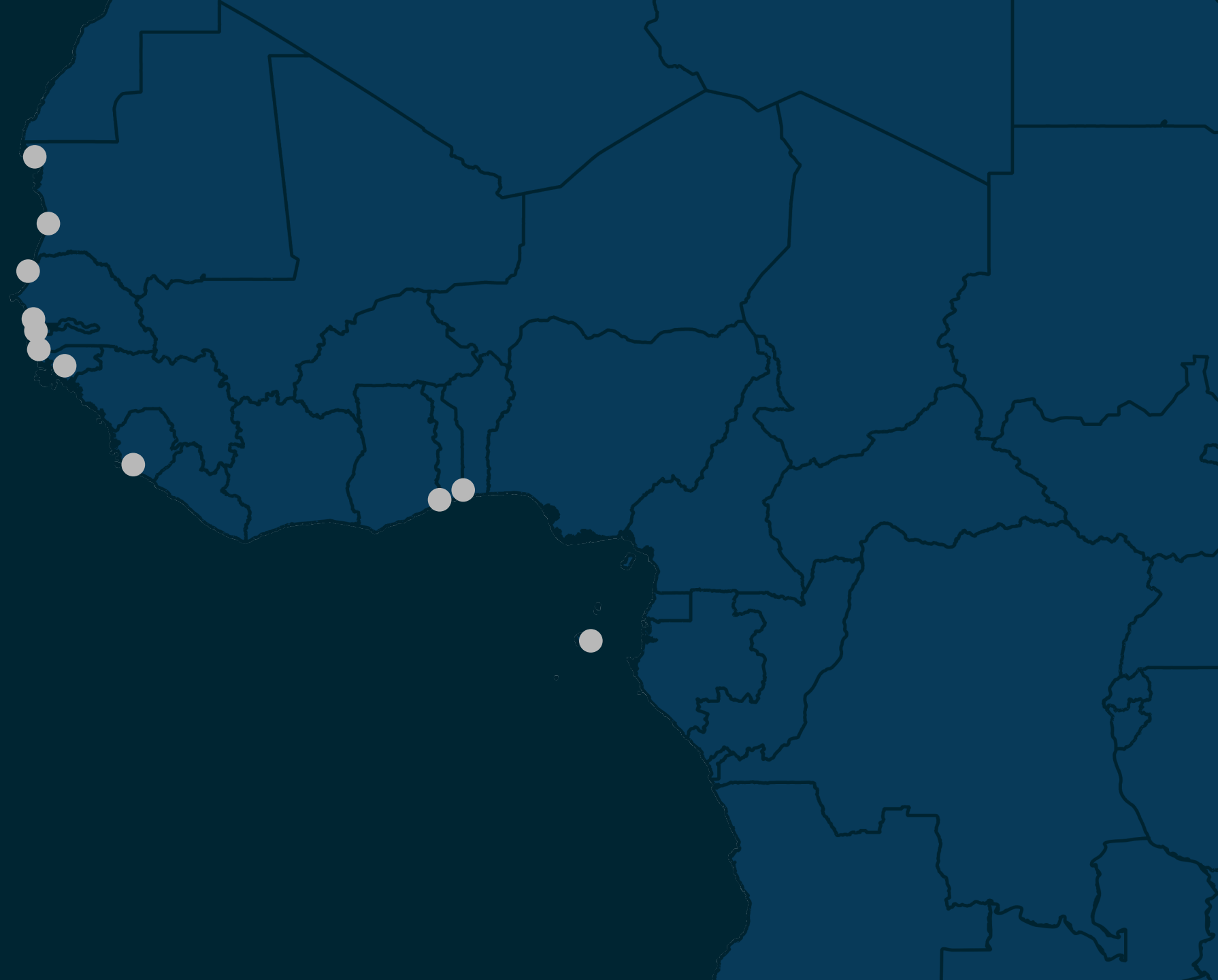
Factsheet 3
Project PAPBIO C1-Mangrove

Factsheet 4
The Gambia Integrated Urban and
Coastal Resilience Program

Factsheet 5
Wooden groynes Epis Maltais

Factsheet 6
Sand engine Togo-Benin

Factsheet 7
Coastal resilience Sao Tomé and
Principe



Factsheet 1

**Dune restoration, Mauritania**

Factsheet 2

Dune restoration in Saint Louis MPA

Factsheet 3

Project PAPBIO C1-Mangrove

Factsheet 4

The Gambia Integrated Urban and Coastal Resilience Program

Factsheet 5

Wooden groynes Epis Maltais

Factsheet 6

Sand engine Togo-Benin

Factsheet 7

Coastal resilience Sao Tomé and Principe

# Dune restoration, Mauritania

2018 – present

*"Artificial watering of young plants may be beneficial in the short-term, but not watering the plants stimulates growth of longer roots making the plant more resilient in the long-term."*

Prof. Mahfoudh Taleb,
Director ISSM/ACNAV

## Problem

Erosion of the low-lying coastline has led to coastal flooding and salinisation of soils in both urban and agricultural areas.

## Measures

Through a combination of biological fixation with the Sesuvium plant and mechanical fixation with sticks, sand is trapped allowing the coastal dunes to grow.

## Effects

Overall, the results are good with the dune cordon raised significantly in certain areas. However, the dunes remain fragile in the sites with shells encountered in breaches.

## Lessons learned

There are few plants that can survive in such a harsh environment. Through a series of experiments, survival rates of the Sesuvium plant were improved from 5% to 95%.

Factsheet 1
Dune restoration,
Mauritania

Factsheet 2
**Dune restoration in Saint Louis MPA**

Factsheet 3
Project PAPBIO C1-Mangrove

Factsheet 4
The Gambia Integrated Urban and Coastal Resilience Program

Factsheet 5
Wooden groynes Epis Maltais

Factsheet 6
Sand engine Togo-Benin

Factsheet 7
Coastal resilience Sao Tomé and Principe

# Dune restoration in Saint Louis MPA

2014 – 2020

*"Learn and be adaptive during the project"*

Moussa Sall, Project Lead CSE

## Problem

Coastal erosion has caused flooding and salt intrusion of the hinterland where villages and fields have been abandoned.

## Measures

Permeable windbreakers made from natural materials (typhavelles) and reforestation captures sand, allowing the dunes to grow and stabilizing the sand spit.

## Effects

There is a net widening of the beach. Also, the sand trapped by wind breakers has stopped seawater from overtopping the dunes.

## Lessons learned

Implementation and learning in parallel can be very effective. Also, NBS can have considerable co-benefits for nature conservation.

Factsheet 1
Dune restoration,
Mauritania

Factsheet 2
Dune restoration in
Saint Louis MPA

Factsheet 3
**Project PAPBIO C1-Mangrove**

Factsheet 4
The Gambia Integrated Urban and
Coastal Resilience Program

Factsheet 5
Wooden groynes Epis Maltais

Factsheet 6
Sand engine Togo-Benin

Factsheet 7
Coastal resilience Sao Tomé and
Principe

# Project PAPBIO C1-Mangrove

2017 – 2024

*"It is very important to know your area. Each area is different."*

Paul Tendeng,
Project Coordinator IUCN

## Problem

Mangrove populations in West Africa are declining. They form an important source of natural resources and offer protection against coastal flooding and erosion.

## Measures

This project aims to enhance resilience to climate change through integrated protection of mangrove diversity and fragile ecosystems in West Africa.

## Effects

49 projects subsidised in 9 countries.

70 people trained during visits organised by PAPBIO.

109 hectares of mangroves restored.

## Lessons learned

It is important to involve stakeholders in all stages of the project and to have continuous exchange with the community for true commitment to the project.

Factsheet 1
Dune restoration,
Mauritania

Factsheet 2
Dune restoration in
Saint Louis MPA

Factsheet 3
Project PAPBIO C1-Mangrove

Factsheet 4
**The Gambia Integrated Urban and Coastal Resilience Program**

Factsheet 5
Wooden groynes Epis Maltais

Factsheet 6
Sand engine Togo-Benin

Factsheet 7
Coastal resilience Sao Tomé and Principe

# The Gambia Integrated Urban and Coastal Resilience Program

2017 – present

*"It is a nice transition that Nature-based Solutions are becoming the default way of working."*

Scott Ferguson, Flood Risk Specialist
World Bank

## Problem

Banjul is exposed to both pluvial and coastal flooding, made worse by coastal erosion.

## Measures

The sponge city approach where green areas are connected will reduce the volume and speed of runoff. Coastal erosion is countered with nourishments and breakwaters.

## Effects

The pre-feasibility is complete, and the project is awaiting implementation. The intended effect is reduced flooding as well as an improved living environment and co-benefits such as tourism.

## Lessons learned

The 'devil' will be in the details as time for implementation is limited and any delays can become problematic.

Factsheet 1
Dune restoration,
Mauritania

Factsheet 2
Dune restoration in
Saint Louis MPA

Factsheet 3
Project PAPBIO C1-Mangrove

Factsheet 4
The Gambia Integrated Urban and
Coastal Resilience Program

Factsheet 5
**Wooden groynes Epis Maltais**

Factsheet 6
Sand engine Togo-Benin

Factsheet 7
Coastal resilience Sao Tomé and
Principe

# Wooden groynes Epis Maltais

2018 – 2022

*"Children can be ambassadors for NBS techniques. They embrace the underlying concepts, while some adults feel safer when protected by grey infrastructure."*

Patrick Chevalier,
Initiator and Project Lead

## Problem

Many villages in the Casamance river mouth suffer from coastal erosion, leading to loss of homes, loss of working space for fishermen, and salt water in agricultural fields.

## Measures

Permeable groynes made of sticks and palm leaves are constructed by the local communities. These cause sand to be deposited, widening the beaches.

## Effects

Between May 2022 and December 2023, the beach in Diogué has expanded seaward with 40 meters. A wider beach provides more security for inhabitants.

## Lessons learned

Maintenance is important and can be made easier for the community by using local materials and arranging structural compensation for a few individuals.

Factsheet 1
Dune restoration,
Mauritania

Factsheet 2
Dune restoration in
Saint Louis MPA

Factsheet 3
Project PAPBIO C1-Mangrove

Factsheet 4
The Gambia Integrated Urban and
Coastal Resilience Program

Factsheet 5
**Wooden groynes Epis Maltais**

Factsheet 6
**Sand engine Togo-Benin**

Factsheet 7
Coastal resilience Sao Tomé and
Principe

# Sand engine Togo-Benin

2022 – 2023

*"One of the reasons Benin chose a Nature-based Solution is that a sand engine could replenish the whole stretch of coast up to Cotonou in Benin"*

Pieter Boer, Regional Manager Boskalis

## Problem

Coastal erosion is a threat to vital infrastructure and the livelihoods of the local population.

## Measures

A large volume of sand has been deposited and, over time, the wind, waves and currents will spread it eastwards along the coastline. This is combined with hard measures in the form of 18 groynes.

## Effects

The beach was eroding by up to 10 meter per year. Following construction already some 50 meter of additional coast has been established. The sand engine should last 10 years.

## Lessons learned

Interaction between the groynes and the sand engine is important. Also, the sand engine should be built with a smooth shape.

Factsheet 1
Dune restoration,
Mauritania

Factsheet 2
Dune restoration in
Saint Louis MPA

Factsheet 3
Project PAPBIO C1-Mangrove

Factsheet 4
The Gambia Integrated Urban and
Coastal Resilience Program

Factsheet 5
Wooden groynes Epis Maltais

Factsheet 6
Sand engine Togo-Benin

Factsheet 7
**Coastal resilience Sao Tomé
and Principe**

# Coastal resilience Sao Tomé and Principe

2018 – 2024

*"Learning from existing projects is important. We received help from experts on mangrove restoration from Senegal."*

Abnilde de Ceita Lima, responsible for WACA ResIP projects in STP

## Problem

Many coastal communities in Sao Tomé and Principe are exposed to coastal erosion and flooding.

## Measures

Interventions to protect the coastal areas include plantation of mangroves in swamp areas to facilitate sedimentation and plantation of palm trees to stabilize the beaches against erosion.

## Effects

40 hectares of mangroves have been restored in four communities, improving flood safety. People living in the areas which are most at risk will relocate to safer areas.

## Lessons learned

Also with limited financial resources, NBS can make a difference.

## Ideas? Share them with our team.

waca@worldbank.com
p.lambregts@hkv.nl

WACA West Africa Coastal Areas Management Program

Netherlands Enterprise Agency

HKV

Witteveen Bos