Nature-based Solutions Weg Naar Zee

Feasibility Study “Accelerate mangrove restoration through beneficial reuse of dredged material”

August 2023

PARTNERS FOR WATER

CO-CREATING IMPACT

Background

- ‘Weg naar Zee’ is a strongly eroding coastal strip, partly due to a lack of mangroves
- Anton de Kom University (Prof Naipal) has an ongoing restoration project with Sediment Trapping Units
- JV Boskalis / De Boer is carrying out a deepening + maintenance contract on the Suriname River running from 2022 – 2024. Boskalis will not be present on site after Aug 2023.
- Various parties have found each other to discuss an integrated approach for this stretch of coast:
  1. Gain in-depth system knowledge
  2. Feasibility, monitoring and maintenance
  3. Involving local people and government (capacity building)
  4. Piloting
  5. Scaling up and replicating concept long Gyana shield
- To mobilize the required expertise through external partners, a RVO Partners for Water subsidy proposal was submitted and granted

Main project partners

Deltares

Lead of overall proposal, Lead of WP1 (monitoring, tools & data), with expertise input in WP2 and WP3

Boskalis

BAGGERBEDRIJF DE BOER
DUTCH DREDGING

Lead WP 2 Feasibility sediment nourishment), lead connection with maintenance dredging operations along the Suriname River. The dredging operation is executed in Joint Venture with De Boer dredging.

CONSERVATION INTERNATIONAL

Co-leading WP3 Feasibility stakeholders' engagement & cooperation Institutional embedding.

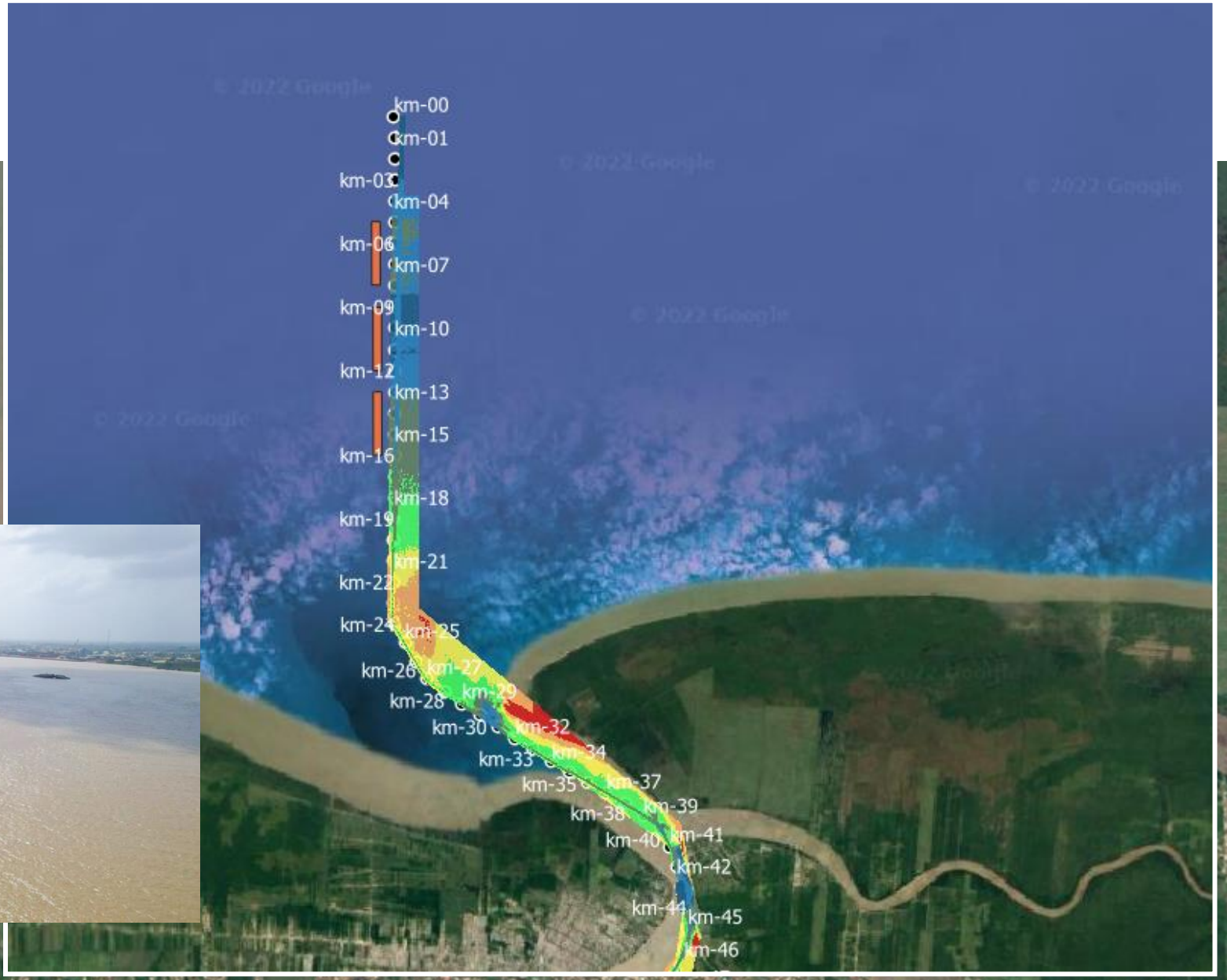
InterConnect

Co-lead WP3 Social sustainable innovations – expertise in project management, community building, cultural understanding, and cutting-edge communication technology

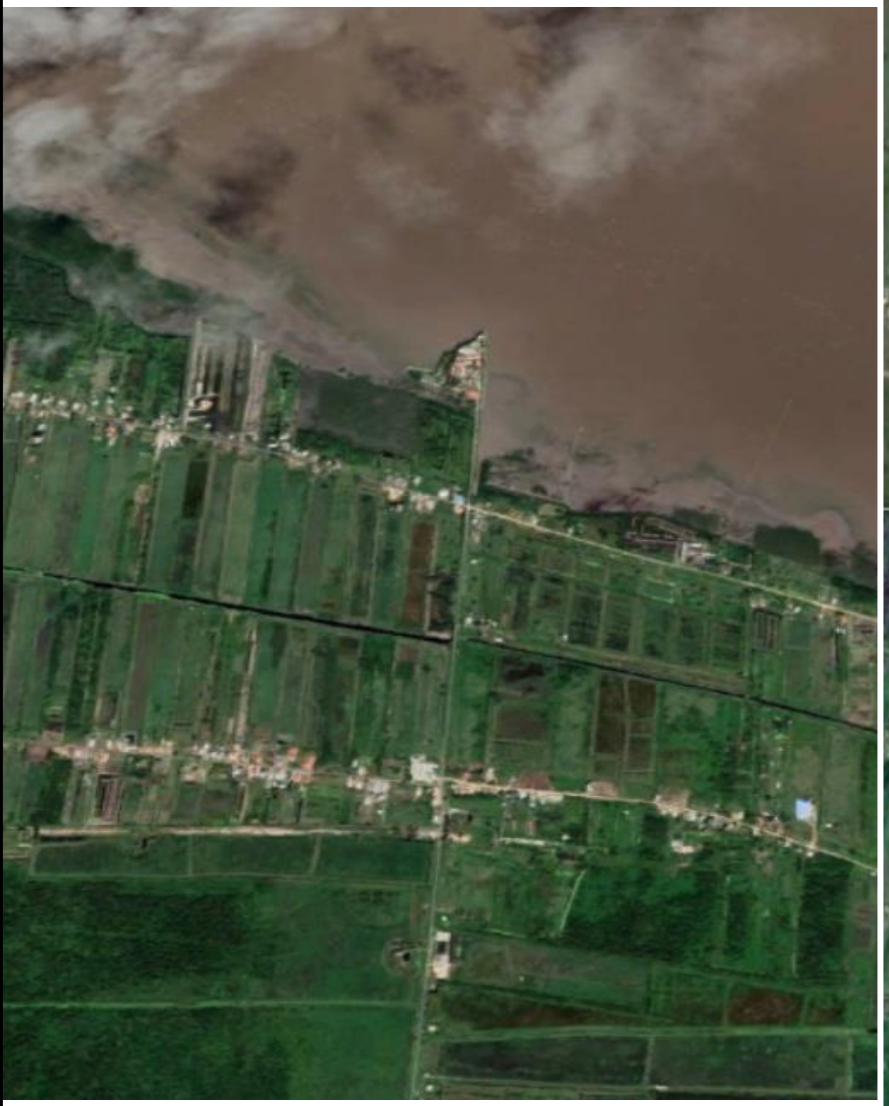
ANTON DE KOM UNIVERSITEIT VAN SURINAME

AdeKUS, represented by Prof Naipal, is the initiator of the current mangrove restoration program. In the study, AdeKUS is the partner for local knowledge and expertise to integrate the new innovative mud nourishment method into the mangrove restoration program for the Surinamese coast.

Current Situation



Current situation

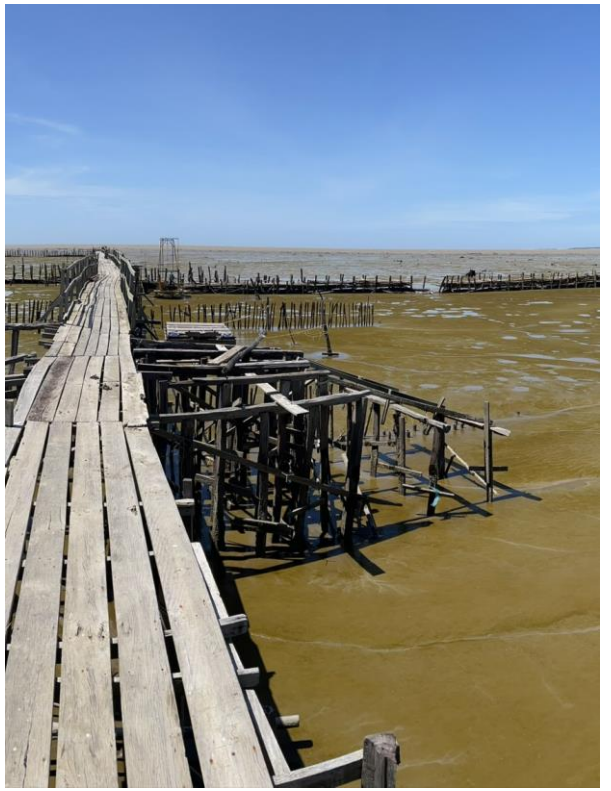


Boskalis Deltares CONSERVATION INTERNATIONAL

FOR WATER
CO-CREATING IMPACT

Current situation



Project description

1. There is a global recognition that beneficial reuse of dredged fine sediments (mud) has great potential for ecosystem restoration

2. However, due to technical, institutional and stakeholder barriers, this concept has never been applied before in the context of mangrove restoration.

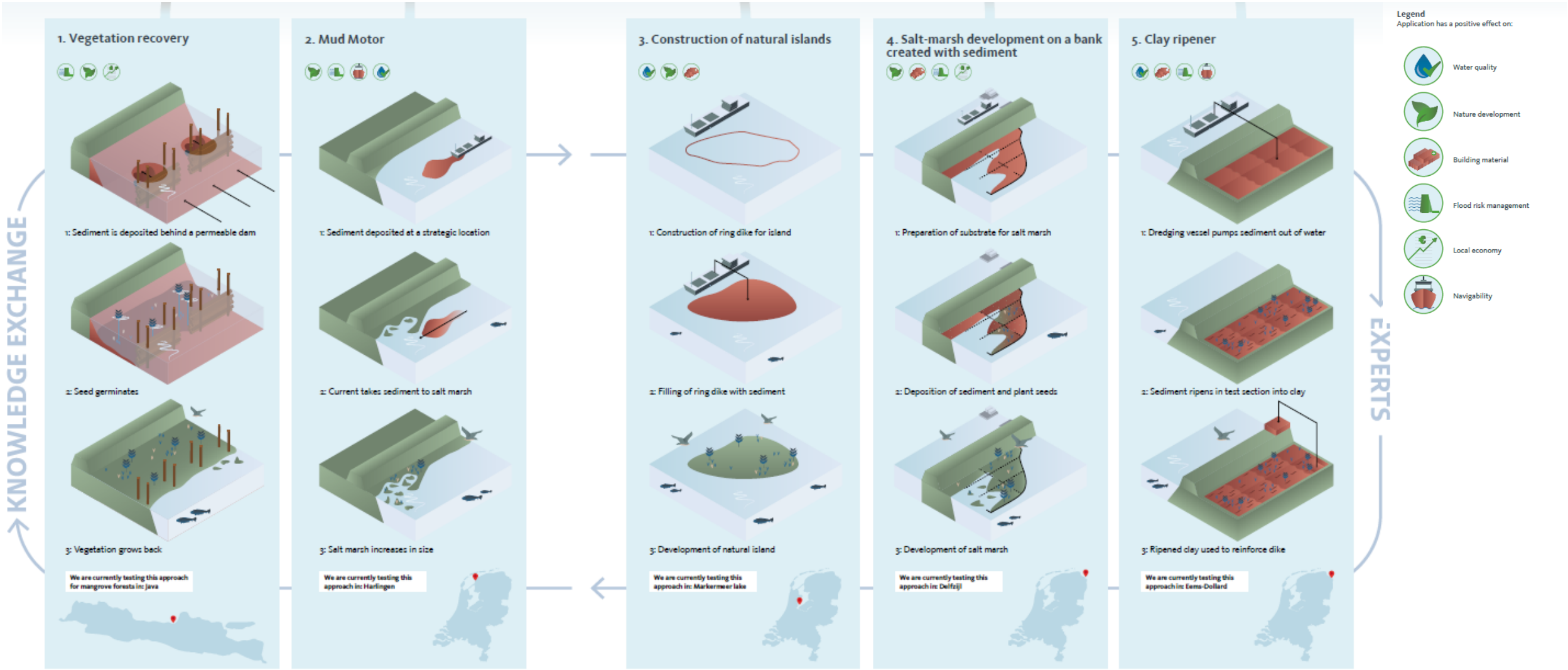
3. Assess the feasibility to beneficially use the sediments dredged from the Suriname River to nourish the coast at Weg naar Zee.

4. By doing so, we could potentially reverse coastal erosion and accelerate the ongoing mangrove restoration works.

5. This Nature-based Solution (NbS) requires an integrated approach for the coastline protection of northern Paramaribo, bringing the appropriate stakeholders together

6. This entails ecosystem restoration by sustainable interventions to develop the biophysical-, spatial- and resource management systems.

Inspiration: Beneficial Reuse for Green-Gray Solutions

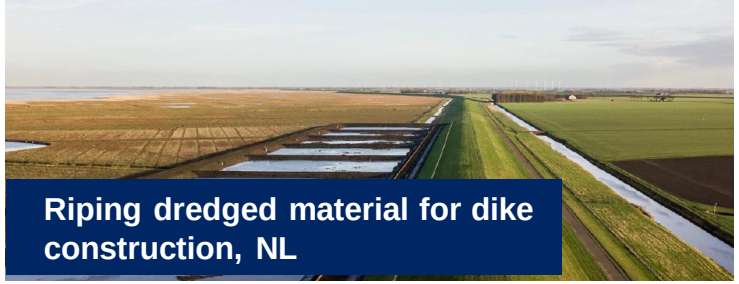


Inspiration: Beneficial Reuse for Green-Gray Solutions

Meegroeidijk, NL

Mangrove restoration Indonesia

Cat Island Chain Restoration, US



Riping dredged material for dike construction, NL

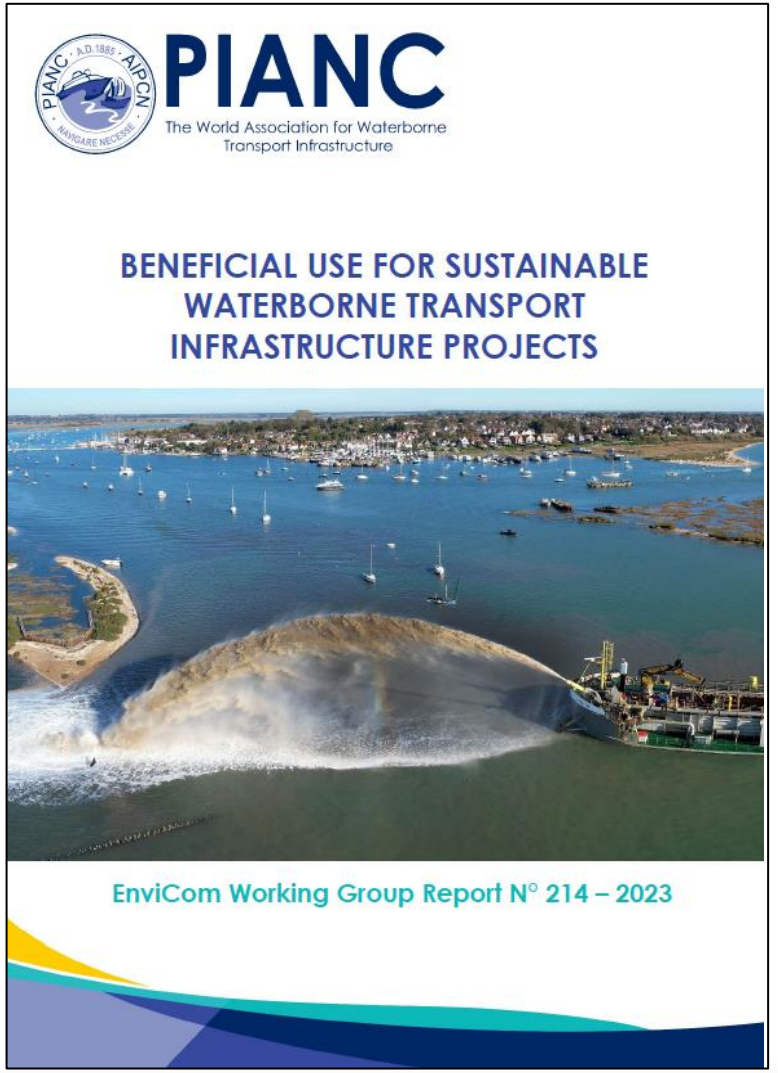
Mangrove restoration, Guyana

Mud Motor, strategically placement of dredged material, NL

Guidance for practical implementation

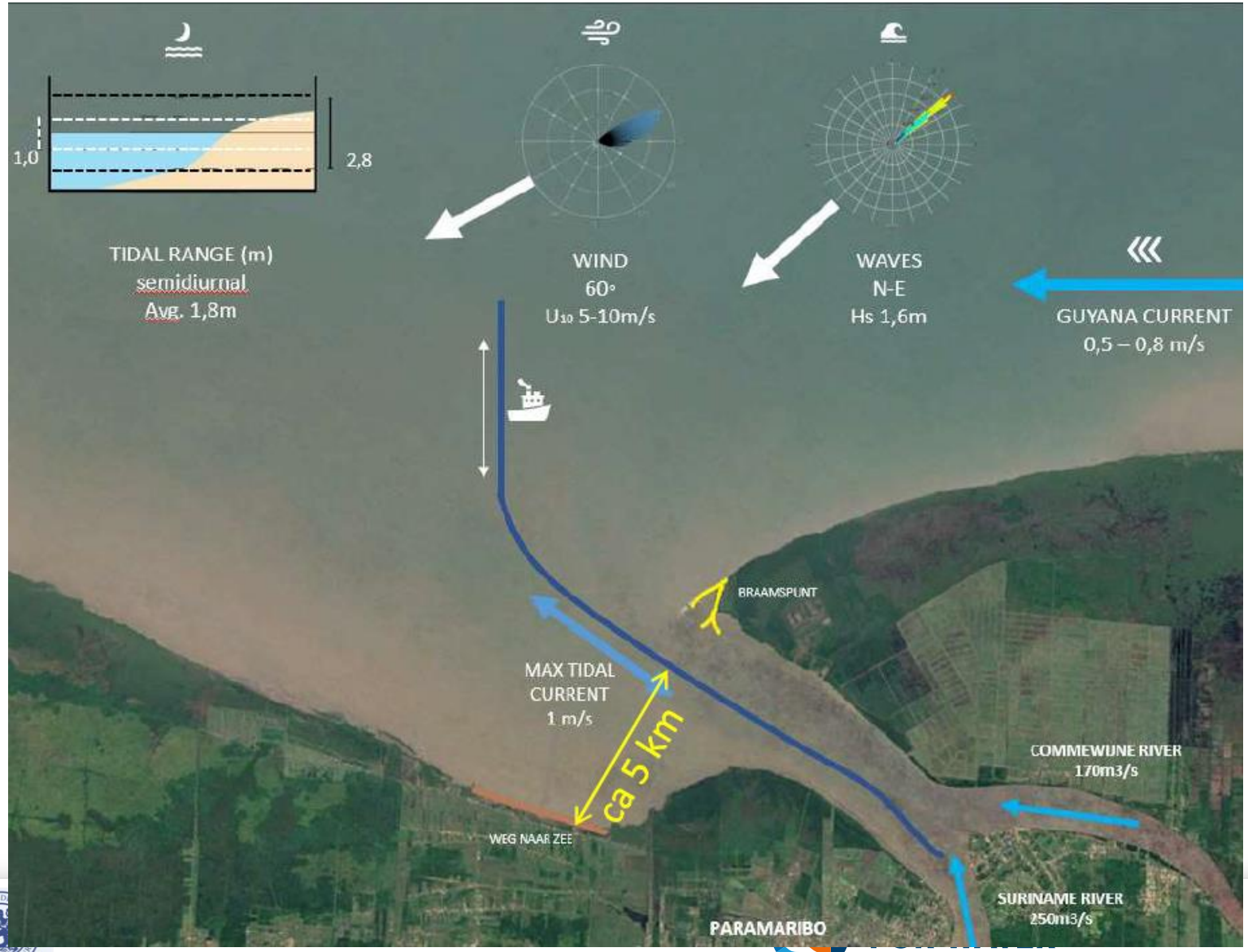
Enablers and technical considerations, based on PIANC 2023:

- Think about BU in early phase of project development and design
- Matching of supply and demand of dredged volume streams; distribute costs & benefits appropriately over different stakeholders
- Engagement of stakeholders and partnering
- Use adaptive risk management and monitoring
- Carefully think about technical project requirements → requirements not based on material characteristics but functional requirements to meet project goals.



Weg naar Zee Setting

- Fairway ca 5 km from Weg aan Zee shoreline
- Foreshore Weg aan Zee is very shallow (< 3 m)
- Dredged sediments cannot be placed directly on eroding Weg aan Zee mudflat (or at very large costs)
- So, what to do?



Research questions

The study will give answers to the following questions:

1. How can we use the natural dynamics to transport the sediment the sediments to the required locations?
2. How can we keep the sediments there and create the required coastal profile?
3. How can we stimulate the formation of mangrove habitat through this technique?
4. How can we align stakeholder interests and ensure that the approach realizes sustainable involvement and follow-ups of these stakeholders?
5. What are the institutional requirements to implement this innovation?
6. How can we engage with coastal communities (the beneficiaries) for broad support?
7. What are the social costs and benefits of such an approach when applied on a large scale?

Expected output

The outputs of the study are:

1. Detailed engineering design of a mud nourishment pilot (including insight in required permits)
2. Landscape proposition of a full-scale application. Landscape propositions accommodate and visualise context information and centers on the development of design propositions as the key tool of communication, stakeholder buy-in, and project structuring. The development of landscape propositions stimulates bottom-up action to develop sustainable and integrated multifunctional infrastructure at landscape level.

Work packages

- WP 1 - Baseline monitoring, tools and data (Lead Deltares)
- WP 2 - Feasibility of mud nourishments (Lead Boskalis)
- WP 3 - Feasibility stakeholders engagement & cooperation (Lead CI and Interconnect)

	WP1	WP2	WP3
Deltares	R	E	E
Boskalis	E	R	E
InterConnect	C	C	R
CI Suriname	C	C	R
AdeK	E	E	E

R Responsible E Expert C Contributor

Expected timeline: Aug ‘23 – Mar ‘24

RESILIENT NORTH BRAZIL SHELF

Rod Braun | Director, Green-Gray Infrastructure

23 August 2023

CONSERVATION INTERNATIONAL

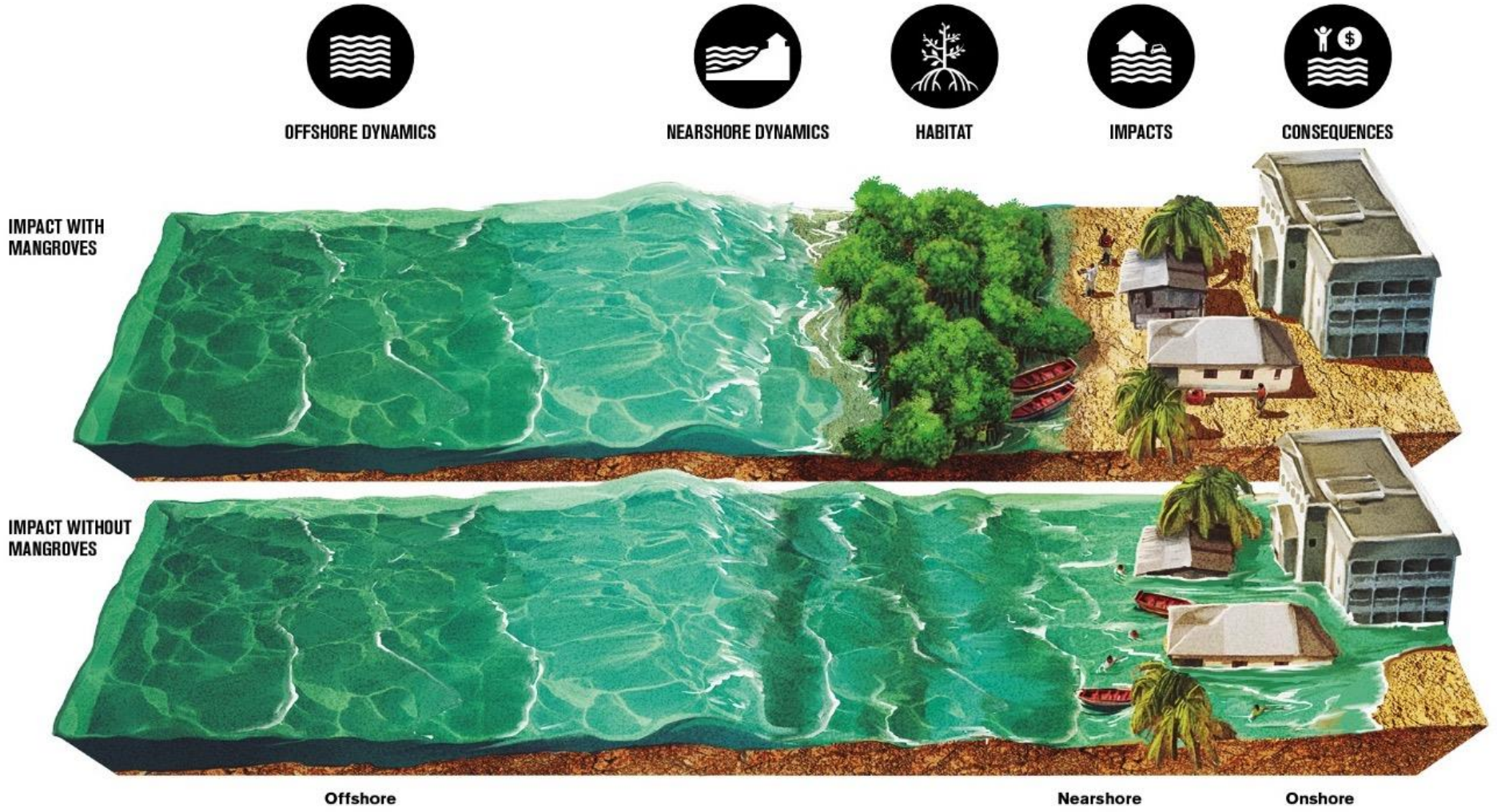
GLOBAL CHALLENGES

- Coastal communities are facing unprecedented levels of risk from climate change, sea level rise, and population migration to coasts
  - ✓ 62,000 people displaced by climate every day
  - ✓ Weather related disasters cost the global economy US$ 300 billion annually
  - ✓ Low-lying coastal zone home to 680 million people

GLOBAL COASTAL RESILIENCE

Green-gray offers an opportunity to fundamentally transform coastal infrastructure to deliver protection and resilience.

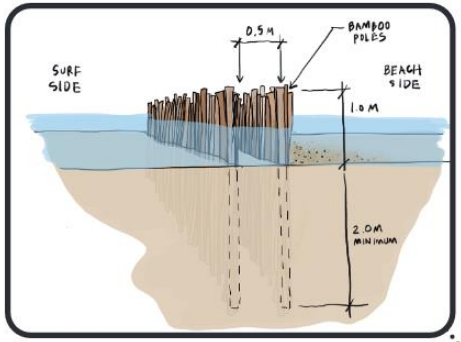
Natural infrastructure like mangroves, oyster reefs, coral reefs and sand dunes protect and provide numerous co-benefits for coastal communities

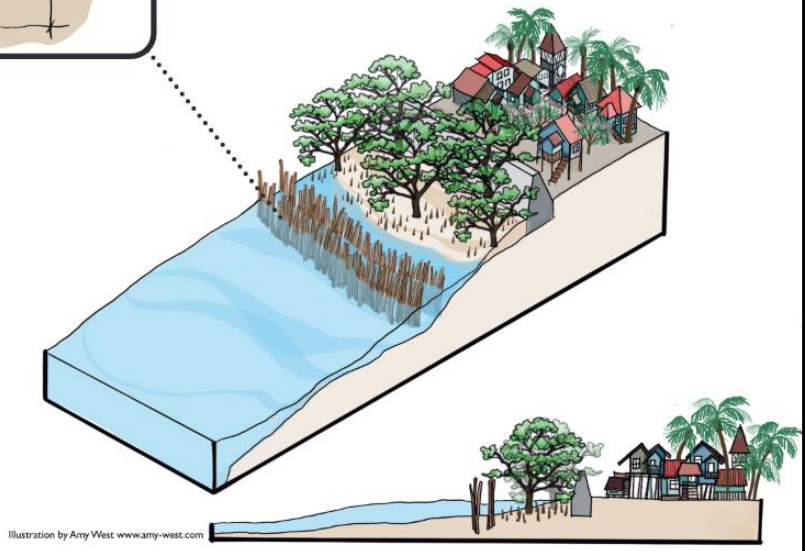


https://www.nepa.gov.jm/new/projects/docs/WorldBank2019_ForcesOfNature.pdf

WHAT IS GREEN-GRAY INFRASTRUCTURE?

- Combination of ecosystem restoration and conservation with built or traditional infrastructure
- Delivers risk reduction benefits and supports livelihoods
- Delivers ecosystem services benefits and supports biodiversity





BLUEPRINTS FOR COASTAL RESILIENCE NORTH BRAZIL SHELF