European Commission

UNLOCKING INVESTMENTS IN NATURE-BASED SOLUTIONS IN OUR INTERNATIONAL COOPERATION

Danube floodplain, Hungary, MERLIN project

JUNIOR PROFESSIONALS

BEATRIZ DUARTE (TRADE) , JULIA RUSCH (ENV), DARIO NIEDERPRUM (HR), EMILIA HAKANEN (ENEST)

PROJECT SPONSOR - DG INTPA F2

ARNAUD DE VANSSAY AND FRANZ HUEBNER

April 2025

NBS IMPLEMENTATION AT EU LEVEL & IN INTERNATIONAL PARTNERSHIPS

At the heart of EU's promotion of NBS there are several key policies, including:

- the **European Green Deal**
- the **Biodiversity Strategy for 2030**
- the **Nature Restoration Law**
- the **EU Adaptation Strategy**

and multiple funding mechanisms, such as:

- **LIFE Programme**
- **European Regional Development Fund (ERDF)**
- **Horizon 2020** and **Horizon Europe**

Restoration of Lima catchment in Portugal, MERLIN project

Only 2 of 128
2024 Global Gateway flagship projects
reference nature as part of infrastructure...

None **of the 2025 ones do.**

OUR PROJECT

Identifying and promoting best practices from existing large-scale initiatives across Europe that could help facilitating a greater uptake of NBS

PHUSICOS

ZANDMOTOR
DELFLANDSE KUST

Mare – Mediterra

WaterLANDS

NATURVATION
cities – nature – innovation

MERLIN

AQUACYCLE

REST-COAST

8 Case Studies

13 Interviews

1 Site Visit

OUR KEY FINDINGS

1) Governance and Stakeholder Engagement

2) Knowledge and Capacity

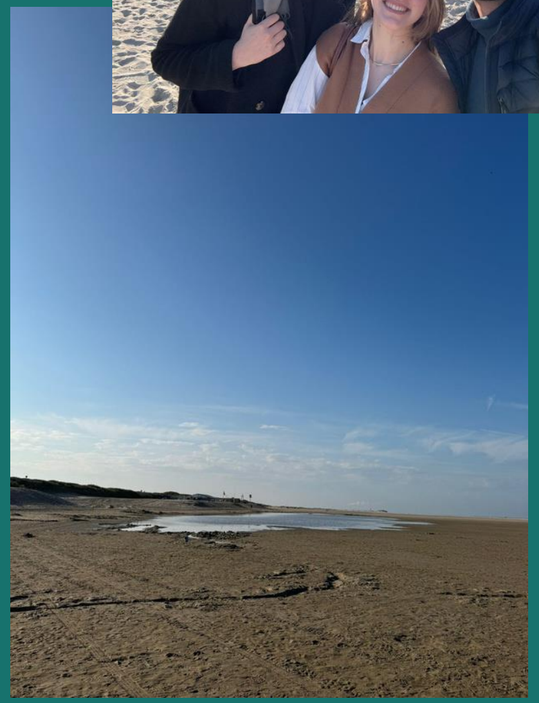
3) Finance

CASE STUDY

ZANDMOTOR (SANDMOTOR)

Sand Motor in 2011

Sand Motor in 2021
Shoreline in 2024



Field trip to the Sand Motor

The Project

Artificial sandbank

Near The Hague

21.5 million m3 of sand

Goal: Improve coastal safety

Pilot: 2011 – 2021

Interreg Project: 2023 - 2028

Key Success Factors

- **Strong Enabling Policy Framework in the Netherlands**
- **Adaptive Co-Governance Management approach**

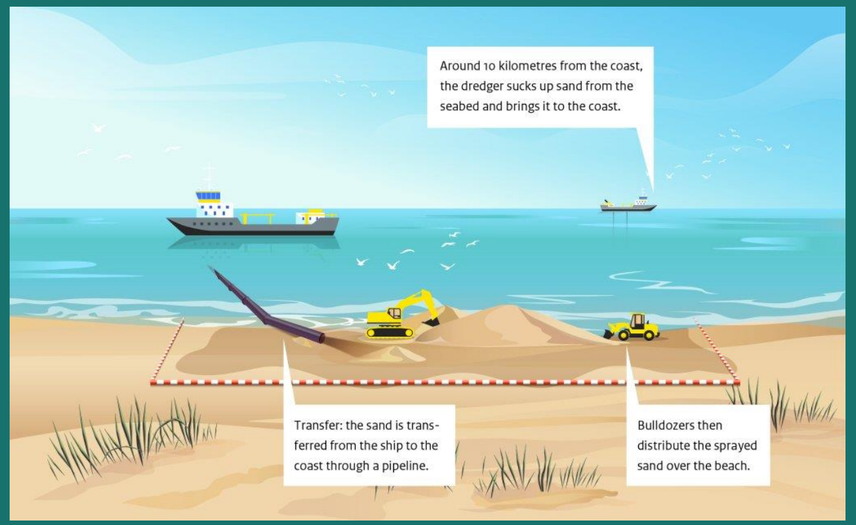
Coastal Policy in the Netherlands since 1990

Storm of 1989

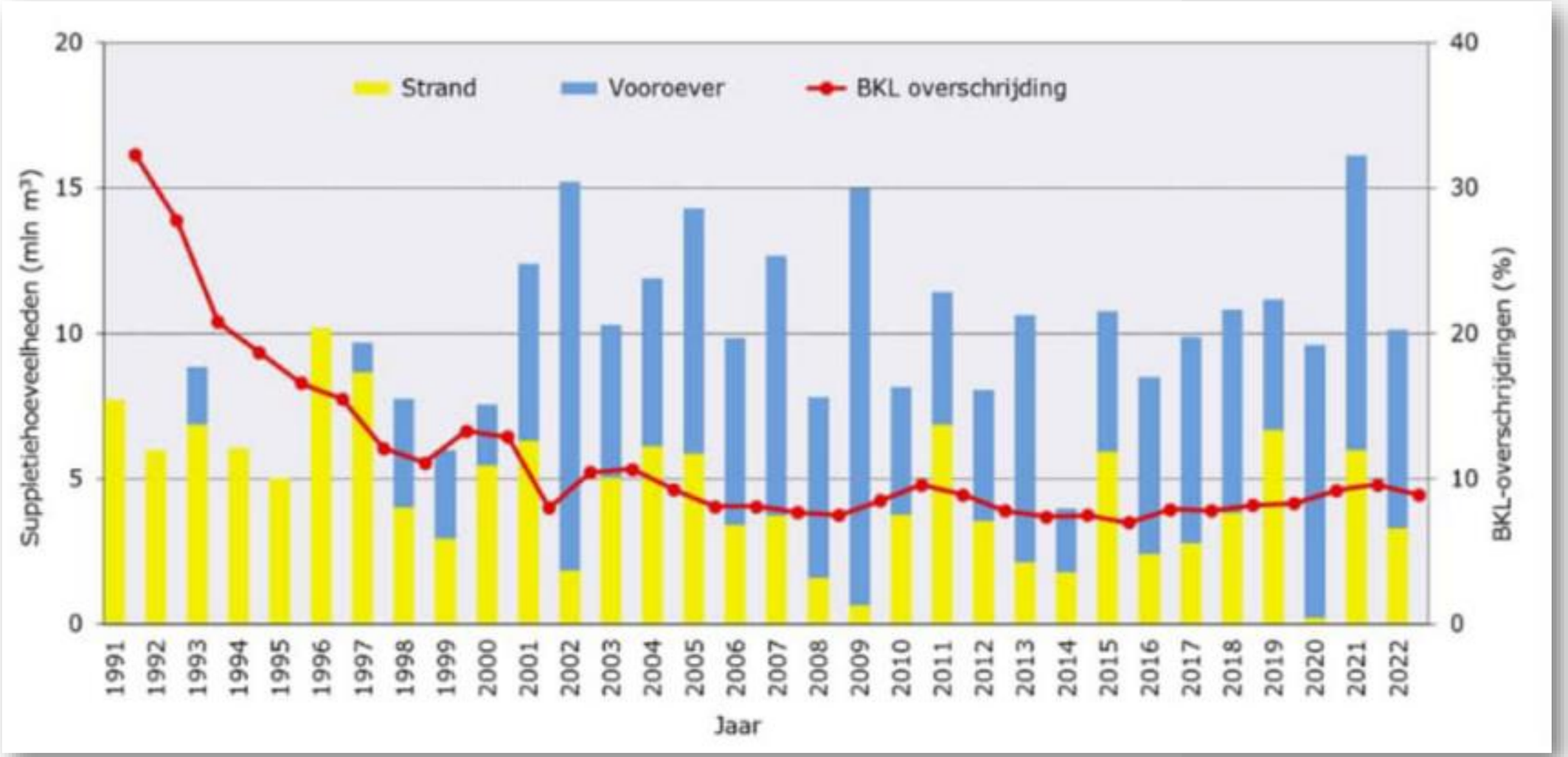
Hold the coastline

- Use sediment preferably
- Ensure safety inside the dikes
- Ensure safety outside the dikes
- Allow for freshwater extraction

Bonus: Allow for recreation & renaturation



Sand Nourishments:
30 Years of Success



Cost-Effectiveness

Small-Scale Nourishments

33 km coastline

Dike Reinforcement & Maintenance

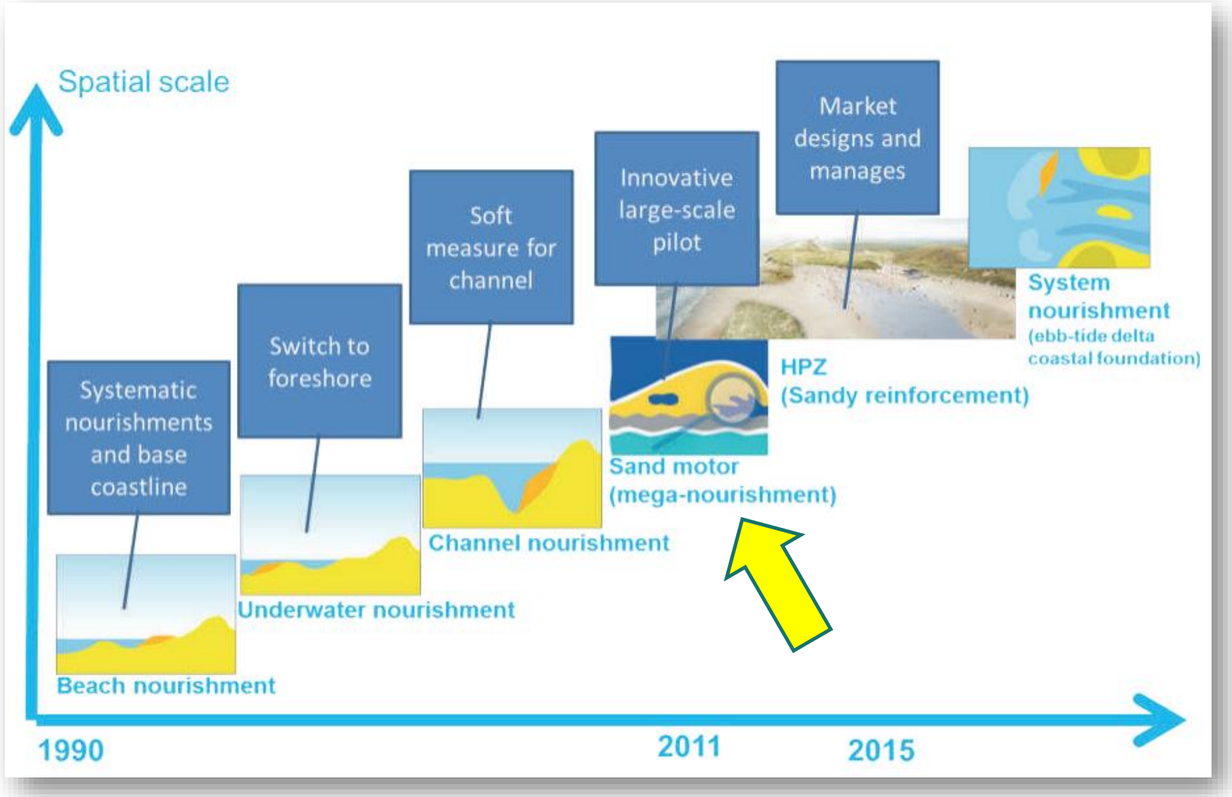
- 1-2 nourishments / year
- 70 in 40 yrs
- Lifespan: 4-5 yrs per cycle

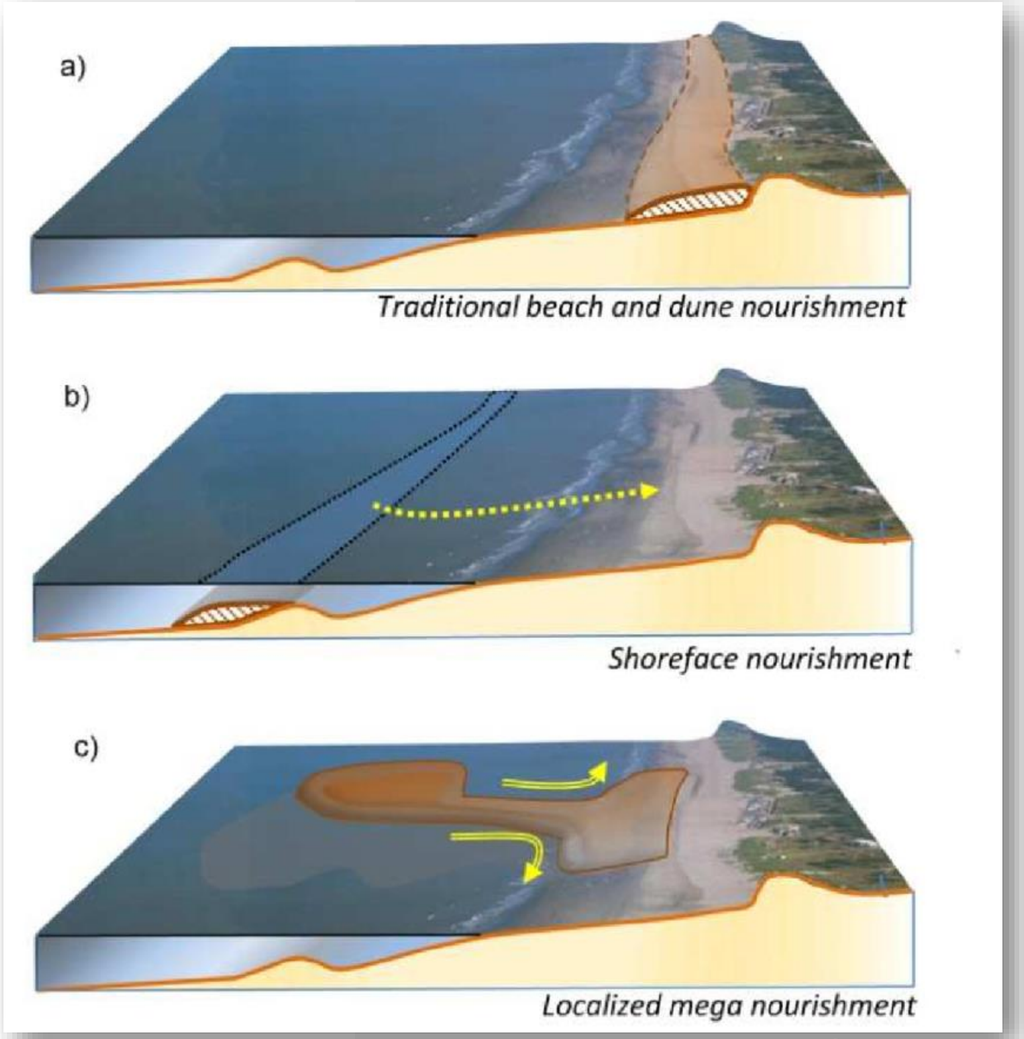
EUR 180 million over 40 years

- EUR 13 million / km
- Lifespan: depends, ~ 25+ years

EUR 163-186 million over 40 years

Save Sand for Later: Mega Nourishments





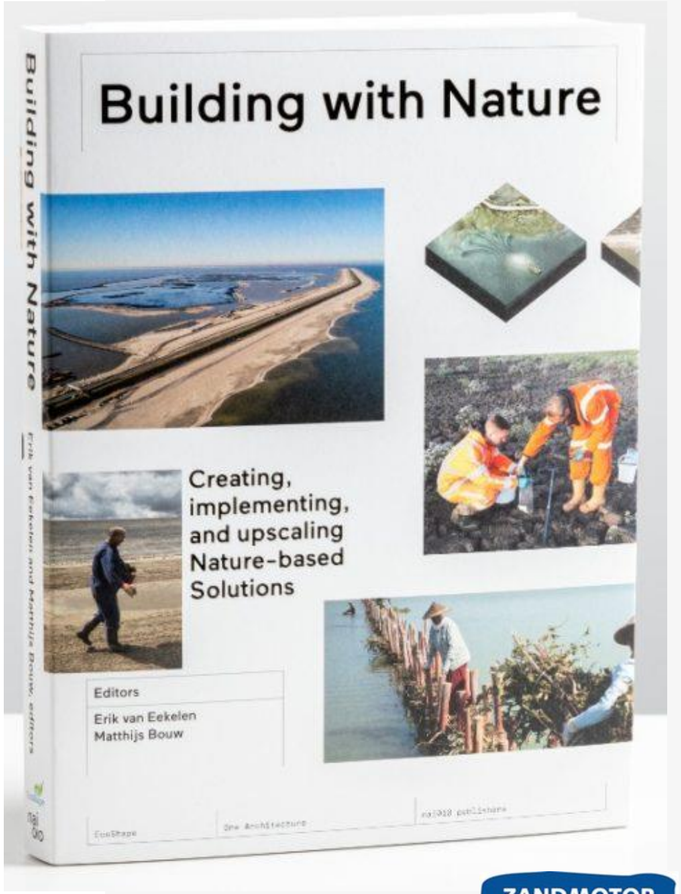
Conducive Regulatory Environment

NbS Mainstreaming

- Coastal reinforcement is legally required
- Preferred policy: “Building with Nature”

Seizing a Policy Window of Opportunity

- 2008 financial crisis led to policy flexibility, investment willingness, cost advantages & favorable market conditions
- Sand Motor as an innovative “pilot” to address long-term coastal maintenance needs & test effectiveness



ZANDMOTOR
DELFLANDSE KUST

Polycentric, Adaptive Governance

Collaborative Governance

- Polycentric & multi-tiered steering group(s)
- Regular management meetings to adapt to challenges/needs
- Strong cooperation between governmental authorities, the private sector & knowledge partners

CASE STUDY

MARA-MEDITERRA

Case study	Algeria	Egypt	Greece	Lebanon	Turkey
Degradation hotspot	Djelfa gateway to Sahara	Coastal area of Nile Delta	Agri-ecosystems on Lesvos Island	Akkar Al-Atika uplands	Marmara lake habitats
Main problematic	Desertification	Water and soil salinization	Rural landscape desertification	Soil and water degradation	Natural ecosystem degradation
					

Agroecological practices

1. Green manure & Cover crops
2. Organic fertilization
3. Mulching
4. Conservation tillage
5. Agroforestry
6. Land settings (terracing)
7. Deficit/precision/ smart irrigation
8. Recycling of cultivation residues
9. Land application of compost / manure / sludge

Eco-engineering Solutions

10. Afforestation (Micro-ecosystem based)
11. Hydraulic barrier to halt seawater intrusion
12. Natural systems of water quality improvement and biomass production
13. Minimum ecological flow for lake / wetland restoration

The Project

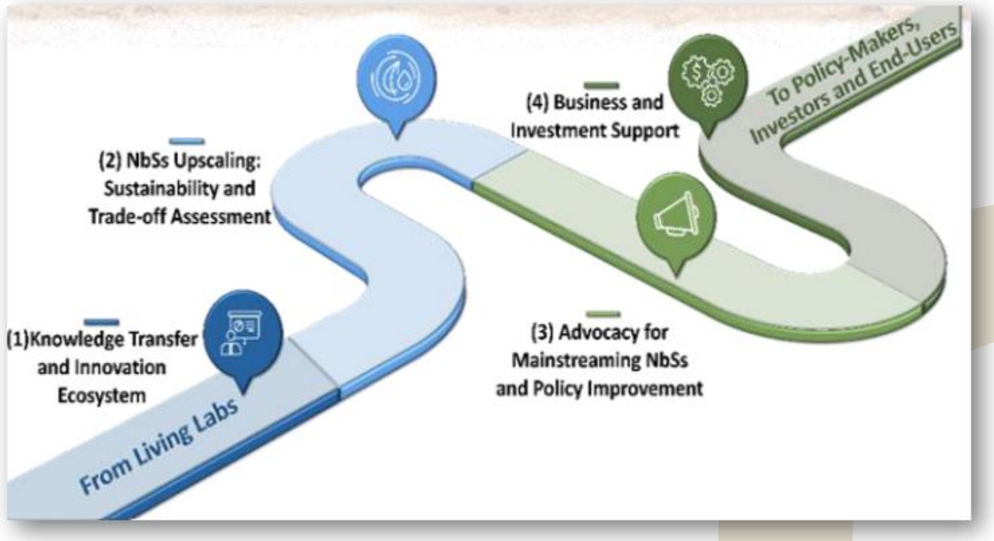
- Increase uptake of NbS in rural Mediterranean agro-ecosystems
- Open up NBS innovation processes to all stakeholders
- Produce solutions addressing key local environmental & societal challenges

EUR 2.5 million

2022-2025

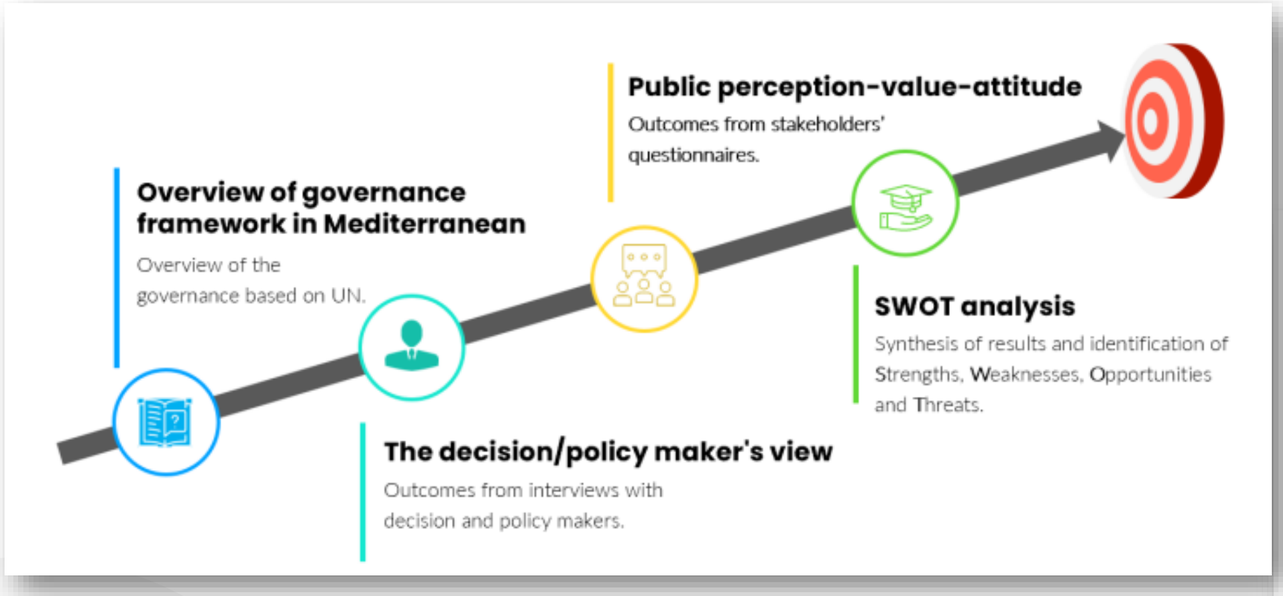
Key Success Factors

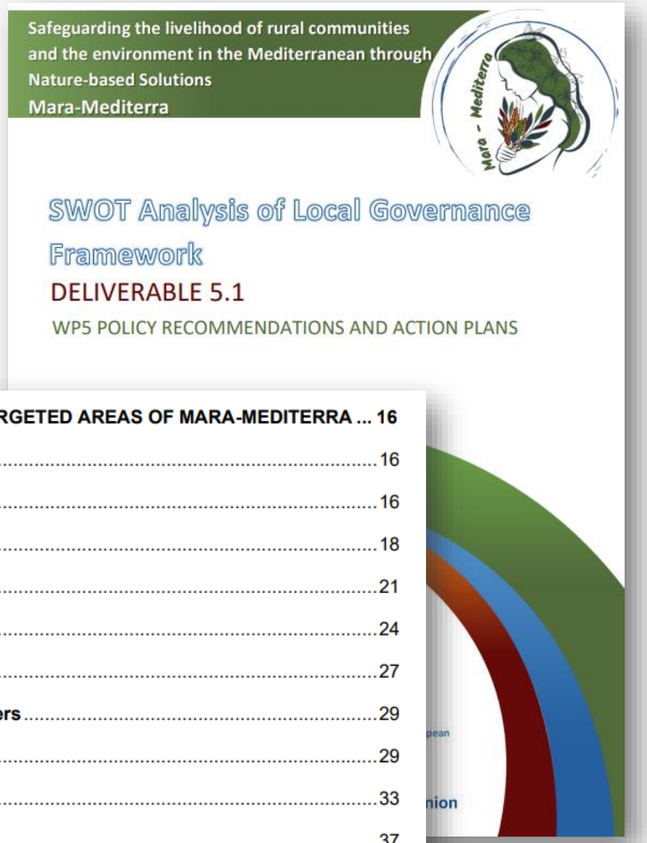
- **Sustained stakeholder engagement in each location**



STRONG STAKEHOLDER ENGAGEMENT

01 Map Governance Framework and Stakeholders




Safeguarding the livelihood of rural communities and the environment in the Mediterranean through Nature-based Solutions
Mara-Mediterra

SWOT Analysis of Local Governance Framework

DELIVERABLE 5.1

WP5 POLICY RECOMMENDATIONS AND ACTION PLANS

STRONG STAKEHOLDER ENGAGEMENT

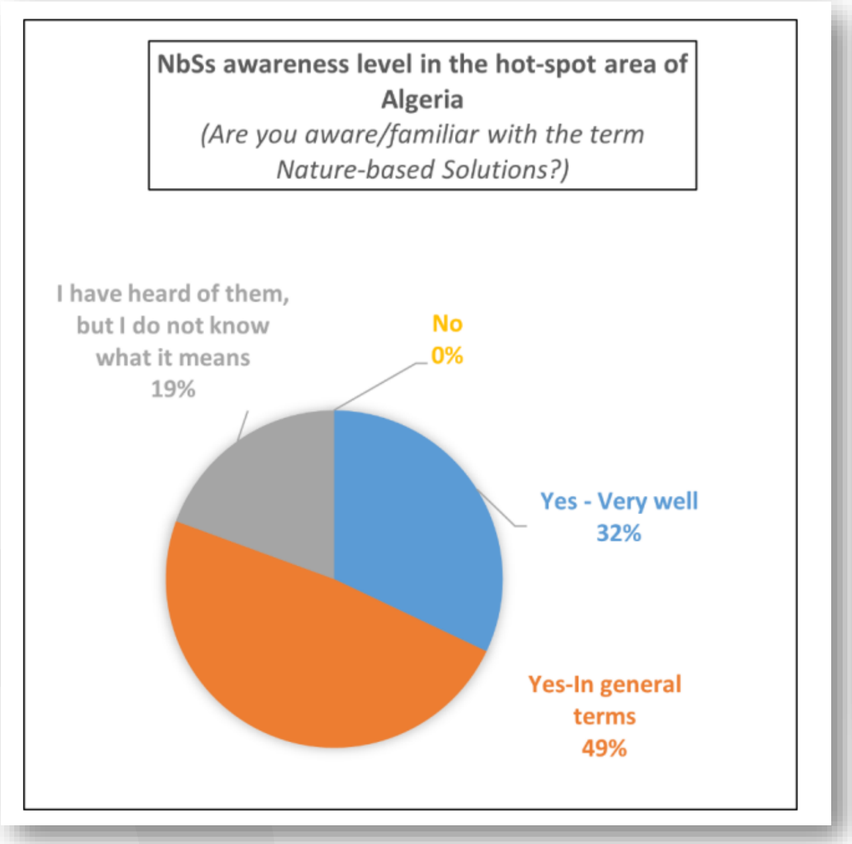
01 Map Governance Framework and Stakeholders

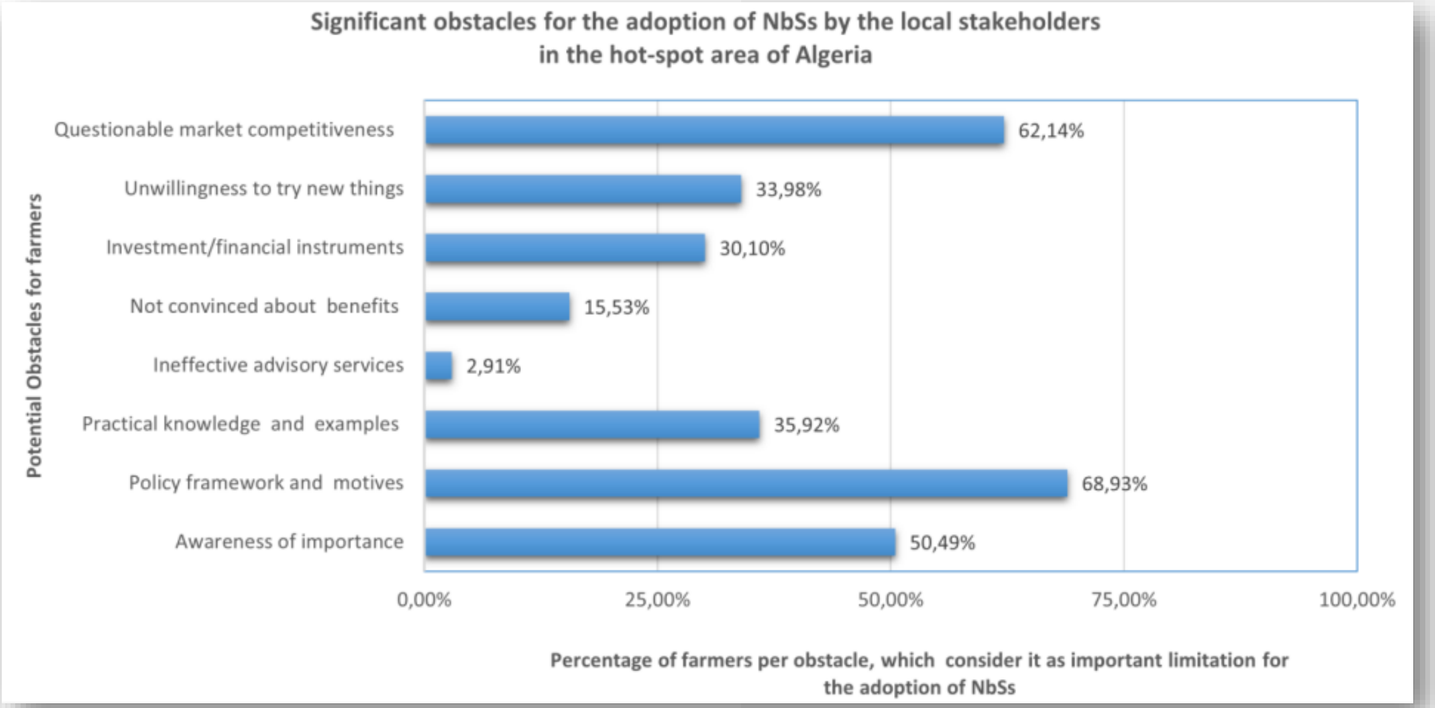
1. Minister of Public Works, Water Resources and Basic Infrastructure
2. Minister of National Solidarity , the Family and the Status of Women
3. Minister of Agriculture and Rural Development
4. Minister of the Environment and Renewable Energies

1. Wali of the Wilaya of Djelfa
2. Minister of Agriculture and Rural Development
3. Chairman of the board at AMENHYD
4. Director of Combating Desertification and of the Green Dam, General Directorate of Forestry

STRONG STAKEHOLDER ENGAGEMENT

02 Tailor Stakeholder Engagement to Identified Needs and Challenges





KNOWLEDGE AND CAPACITY BUILDING

Consequences of the Knowledge Gap:

- **Inadequate project planning and implementation**, leading to reduced effectiveness and efficiency
- **Insufficient stakeholder engagement and participation**, resulting in decreased ownership and increased opposition
- **Inability to navigate complex funding mechanisms** and secure long-term financing
- **Limited capacity to adapt to changing environmental conditions** and emerging challenges

WATERLANDS project

KNOWLEDGE AND CAPACITY BUILDING

To mitigate this barrier:

01 **Need for Accessible Knowledge & Promoting Knowledge Exchange**

02 **Building Local Capacity & Knowledge Transfer**

01 Need for Accessible Knowledge & Promoting Knowledge Exchange

Mitigating the impact of fragmented sources of knowledge, lack of standardised guidelines:

ZANDMOTOR
DELFLANDSE KUST

- **Adaptive Management Approach**
- **Field studies**

- **Regional platforms to facilitate the knowledge exchange**
- **6 Action Sites ⟶ local hubs**

01 Need for Accessible Knowledge & Promoting Knowledge Exchange

Centralisation of knowledge:

Living Lab Approach

- Innovation ecosystem that uses real-life settings for co-creation and testing, enabling real-time learning

SAND MOTOR

- Living Lab
- Collaborated with Delft and Utrecht Universities
- Established research programmes with doctorate and post-doctorate researchers

MARA-MEDITERRA

- Living Lab Approach to engage stakeholders

Network Nature

- Support in establishing local and regional hubs

01 Need for Accessible Knowledge & Promoting Knowledge Exchange

Increasing awareness about the multiple benefits of NBS:

ZANDMOTOR
DELFLANDSE KUST

- Effective communication with local stakeholders

⟶ Essential to increase local acceptance and incentivize private sector involvement

WaterLANDS

- Emphasized the need for greater awareness of advantages and trade-offs
- **⟶ Effective communication**

02 Building Local Capacity & Knowledge Transfer

Increasing multidisciplinary collaboration:

PHUSICOS

MERLiN

- **Multidisciplinary teams integrating ecologists, hydrologists, policy experts, and social scientists**

ZANDMOTOR

DELFLANDSE KUST

- **Collaborative approach from the Dutch Ministry, the Province of South Holland, Deltares, and multiple knowledge partners**

02 Building Local Capacity & Knowledge Transfer

Training and stakeholder involvement:

PHUSICOS

- **Key components of the project:** training and sharing of knowledge between local stakeholders, contractors and end users

- Stakeholder involvement through workshops ⟶ **maintaining interventions post-project**

MERLiN

Mainstreaming **E**cological **R**estoration of freshwater-related ecosystems in a **L**andscape context: **IN**novation, upscaling and transformation

Informative environment to advance the understanding and effectiveness in the field of freshwater ecosystem, wetland restoration and NBS

Mainstreaming **E**cological **R**estoration of freshwater-related ecosystems in a **L**andscape context: **IN**novation, upscaling and transformation

Learning Modules

· Online learning platform for registered users
· Enables interactive learning while tracking progress
· Participants receive a completion certificate issued by MERLIN

Webinars

· Complement the information provided in the learning modules

Knowledge Centre

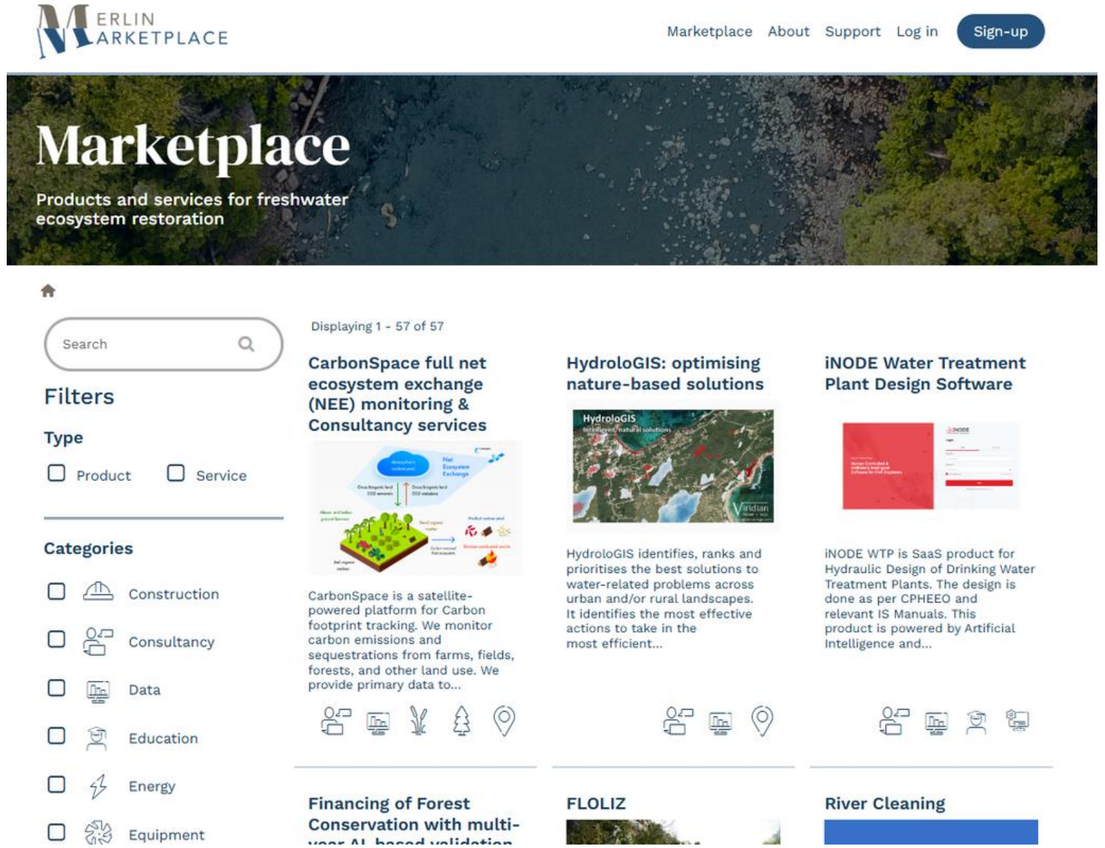
· Collection of valuable resources, such as:
1) Scientific publications
2) Manuals

Podcasts

· e.g. Behind the scenes look at some freshwater restoration projects

MERLIN

Mainstreaming **E**cological **R**estoration of freshwater-related ecosystems in a **L**andscape context: **IN**novation, upscaling and transformation



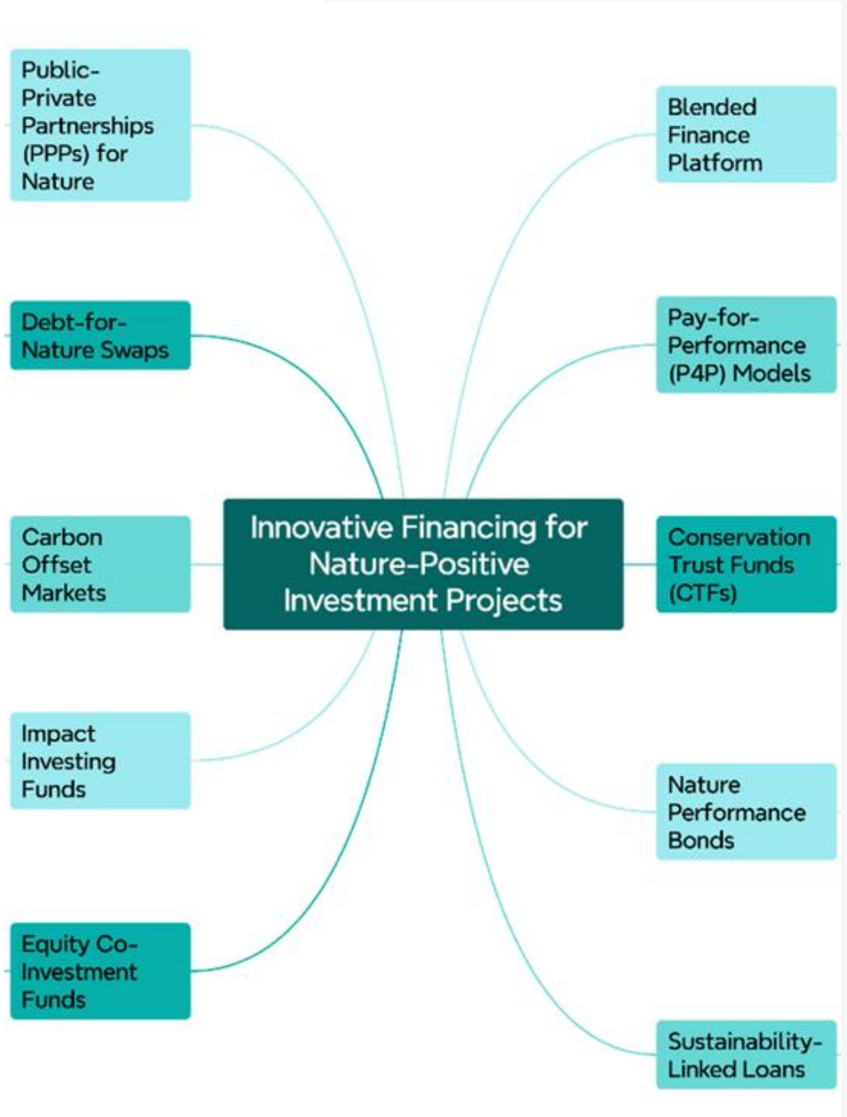
FINANCE

01 Financial Challenges

- High Upfront Costs due to Delayed Revenue Realisation
- Economically Quantifying and Monetising Ecosystem Services

02 Financial Instruments

- Environmental Impact Bonds (EIBs)
- Blended Finance Models through Concessional Capital



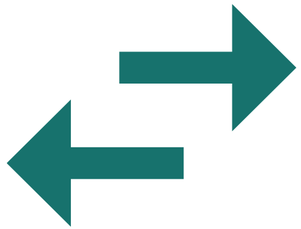
01 Financial Challenges

High Upfront Costs due to Delayed Revenue Realisation

REST-COAST

- This project requires approximately 25% more initial investment than the grey infrastructure equivalent.
- However, in the long-run, the project offers saving through reduced maintenance costs

Higher cost-effectiveness



AQUACYCLE

- High upfront costs due to **regulatory burden**, **knowledge gaps** and **lack of comprehensive policies for wastewater management** (specially in the case of Tunisia)

SAND MOTOR

High Upfront Costs due to Delayed Revenue Realisation

<u>The Netherlands:</u>

- Average annual nourishment volume: 12 million m^3
- EUR 3-10 / m^3

  (~ sand availability, transport distance, nourishment type)

Min. EUR 40 million / year

<u>Sand Motor</u> = 17 km coastline (Delfland coast)

- ~21.5 million m^3 sand
- One-time cost of EUR 50 million for sand deposit

  + EUR 20 million for monitoring programme
- 2016: 95% of original sand still in the area
- Initial lifespan: ~ 20 years; today's estimate: 20-30 years

Sand needed for the Delfland coast:

~ 300.000-500.000 m^3 / year

=> between EUR 1-5 million / year.

Multiple Benefits: Recreation & Nature

+ Development of flora & fauna

- Sea kelp, rush grass, marram grass
- New (embryonic) dune development
- Increase in diversity of habitats for fish, shorebirds & marine mammals
- Less disturbance due to avoidance of replenishments

+ Attractive recreational area

- “Naturalness” attracts recreational guests
- New businesses, i.e. kitesurfing school
- Positive perception among public
- Art & archeological activities

Figure 5.3 Art gallery on the beach of the Sand Motor (Laan, 2019 and 2020

01 Financial Challenges

Economically Quantifying and Monetising Ecosystem Services

PHUSICOS

- Translating the monetisable benefits of community resilience against natural hazards into financial metrics remains challenging

MERLIN

- Offering substantial public benefits does not produce immediate financial returns

Case of Coca-Cola

Coca-Cola and its bottling partners have invested in projects that promote watershed health, while supporting NBS such as reforestation, wetland and meadow restoration, and irrigation system improvements.

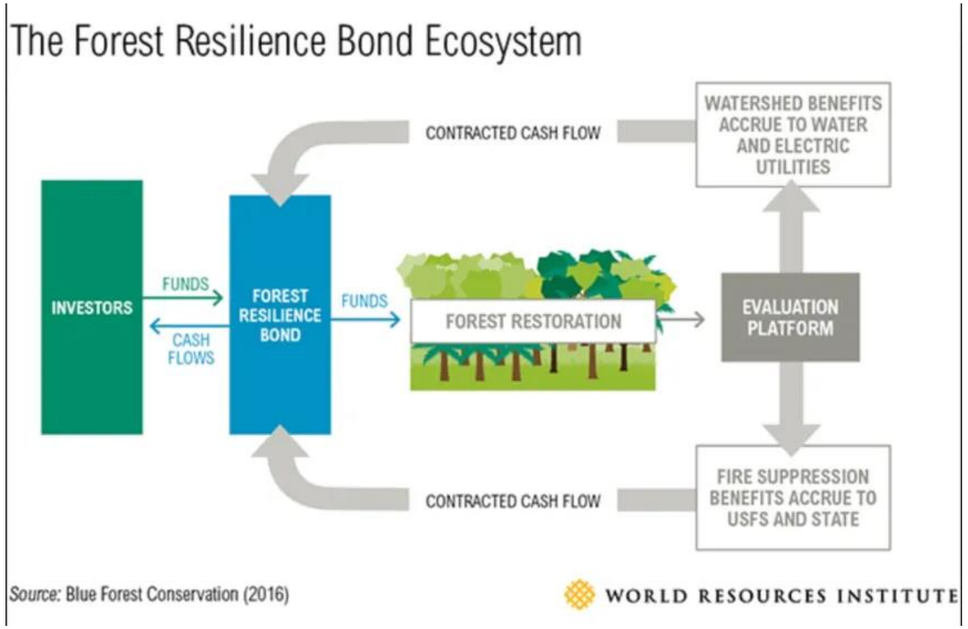
Bursa, Turkey

02 Financial Instruments

Environmental Impact Bonds (EIBs)

Forest Resilience Bond (FRB) for Wildfire Management

- Designed to mitigate wildfire risk in the United States
- Assigns financial value to ecosystem services such as **fire risk reduction, water quality improvement** and **hydropower benefits**
- Through **PFS contracts**, public and private beneficiaries (e.g. the US Forest Service) reimburse investors
- Payments made on the basis of measurable outcomes, e.g. increased water volumes and reduced firefighting costs



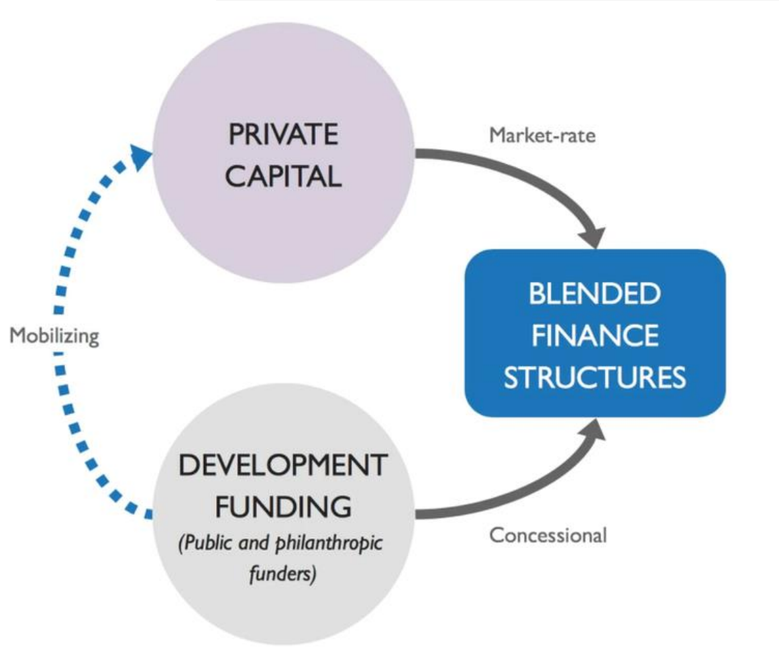
Repayments are directly linked to the project's actual performance, aligning financial outcomes with measurable environmental benefits!

02 Financial Instruments

Blended Finance Models through Concessional Capital

Seychelles Blue Bond

- Issued in 2018
- Raised approximately **€14.4 million to finance Seychelles' marine conservation strategy**, focusing on sustainable fisheries and the creation of marine protected areas
- Approach inspired similar projects in Belize, Indonesia and Ecuador



European Commission

ANY QUESTIONS?

READ OUR REPORT AND RECOMMENDATIONS

EXPLORE OUR CASE STUDIES

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