



Using systemic approaches and simulation to scale nature-based infrastructure for climate adaptation

Stakeholder Consultation

October 2020

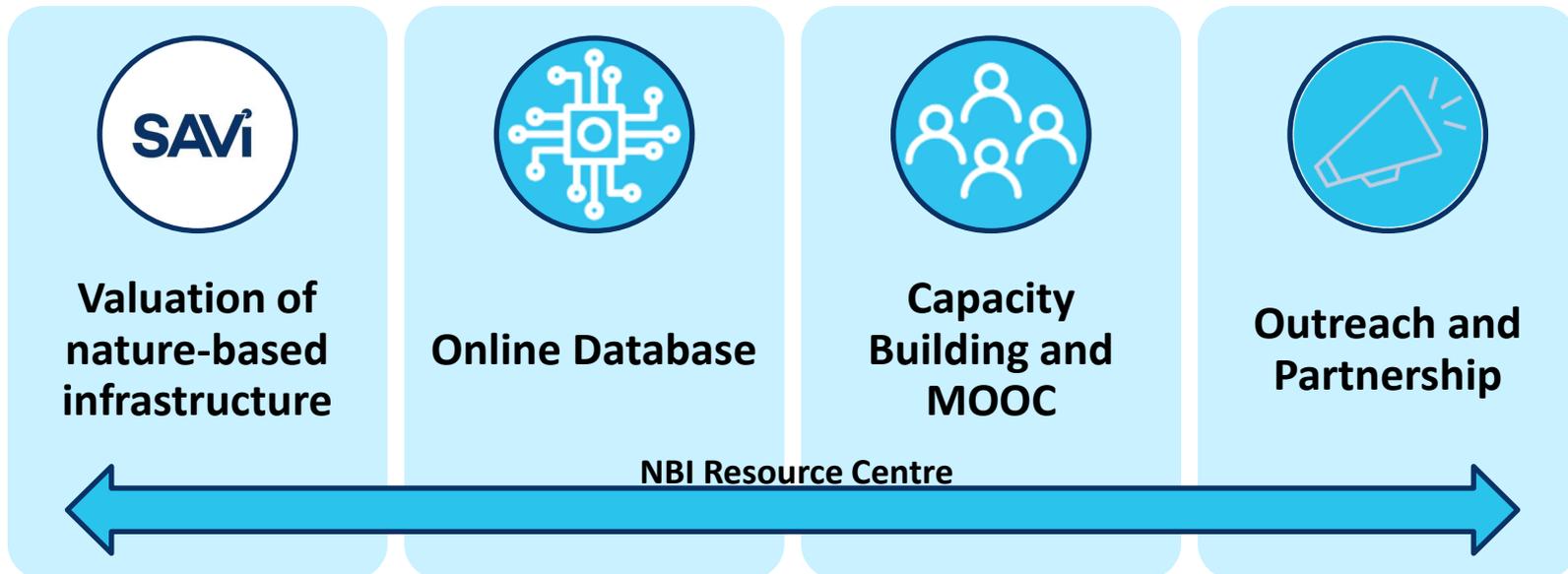




A new partnership “to enhance adaptation to climate change by establishing the business case, building capacities, and enabling increased investment in nature-based infrastructure”



4 Project Components



Project duration: 2021 - 2025



What is nature-based infrastructure?

Nature-based infrastructure (NBI) refers to deliberately planned and managed natural ecosystems and working landscapes to generate value for society.



Natural Ecosystems



Hybrid Infrastructure



Enhance the delivery of ecosystem services including those that are analogous to public infrastructure



Enhance the delivery of co-benefits to human populations



Serve as a substitute for building traditional grey infrastructure and reducing the need for the latter



Increase the efficiency of traditional grey infrastructure



Why nature-based infrastructure?

Benefits of nature-based infrastructure:



Cost-effective solutions for community resilience

- This infrastructure can provide cost-effective solutions for communities and ecosystems as they face changing climates and extreme weather.



Delivery of co-benefits

- Ecosystem services that deliver value to society (carbon sequestration, water regulation and water provisioning).
- Strengthen livelihoods in rural and urban settings.



Adaptability for hybrid solutions

- NBI can include bio-engineered components that increase such infrastructure's ability to withstand and guard against extreme weather.



Less capital requirements for adaptation

- NBI can reduce the need for governments to mobilize capital to finance expensive grey infrastructure solutions for adaptation.
- NBI requires less maintenance, at a lower cost.



Why this project?

Assessing the barriers to scale nature-based infrastructure



Lack of **rigorous and systemic assessments** on the potential of NBI to provide adaptation and infrastructure services



Lack of understanding of the **biophysical and monetary value of many ecosystems and their related co-benefits**



Lack of comparability and certainty for policy makers, infrastructure planners and investors to be able to rely on **the performance of NBI**



Lack of ability to compare **the capital costs, operating costs and (indirect) revenue streams of NBI** with grey alternatives for adaptation



NBI has a nascent track record and as a result, **has an overall lower level of predictability and comparability.**

Component 1: Valuation of nature-based infrastructure



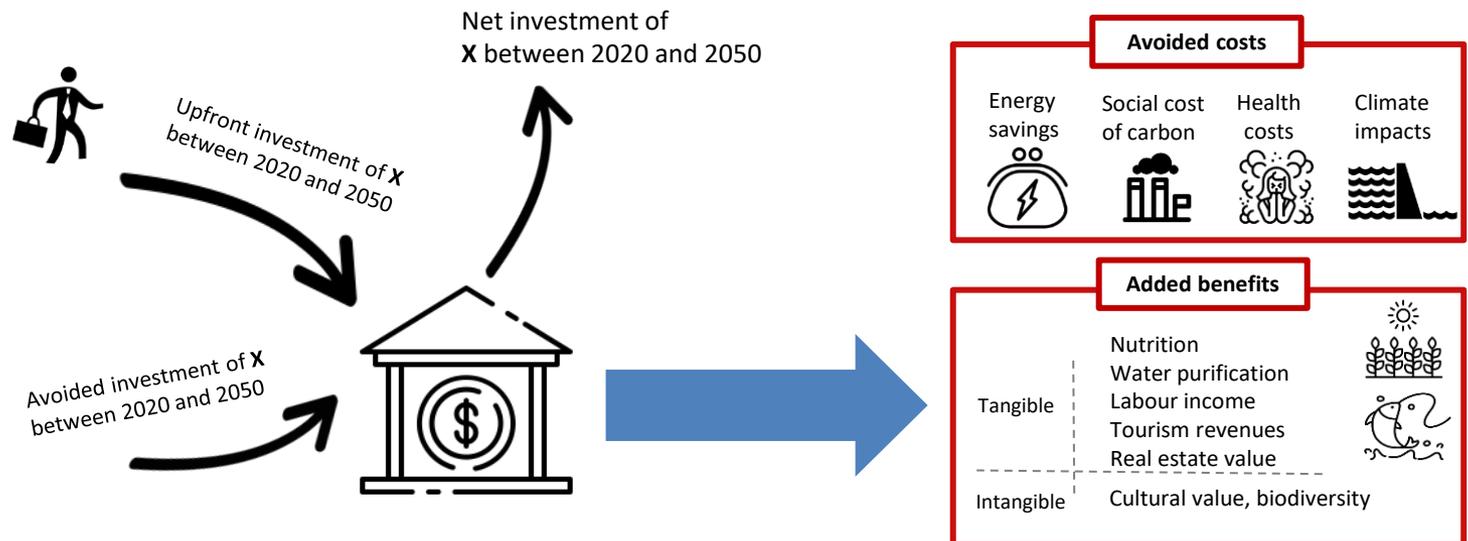
Objectives



Improving the predictability and knowledge on the performance of NBI for climate adaptation and the provision of other infrastructure services through more comparable and credible evidence on capital and operating costs and benefits of NBI. To put things into perspective, the performance of NBI will be compared to grey infrastructure alternatives.



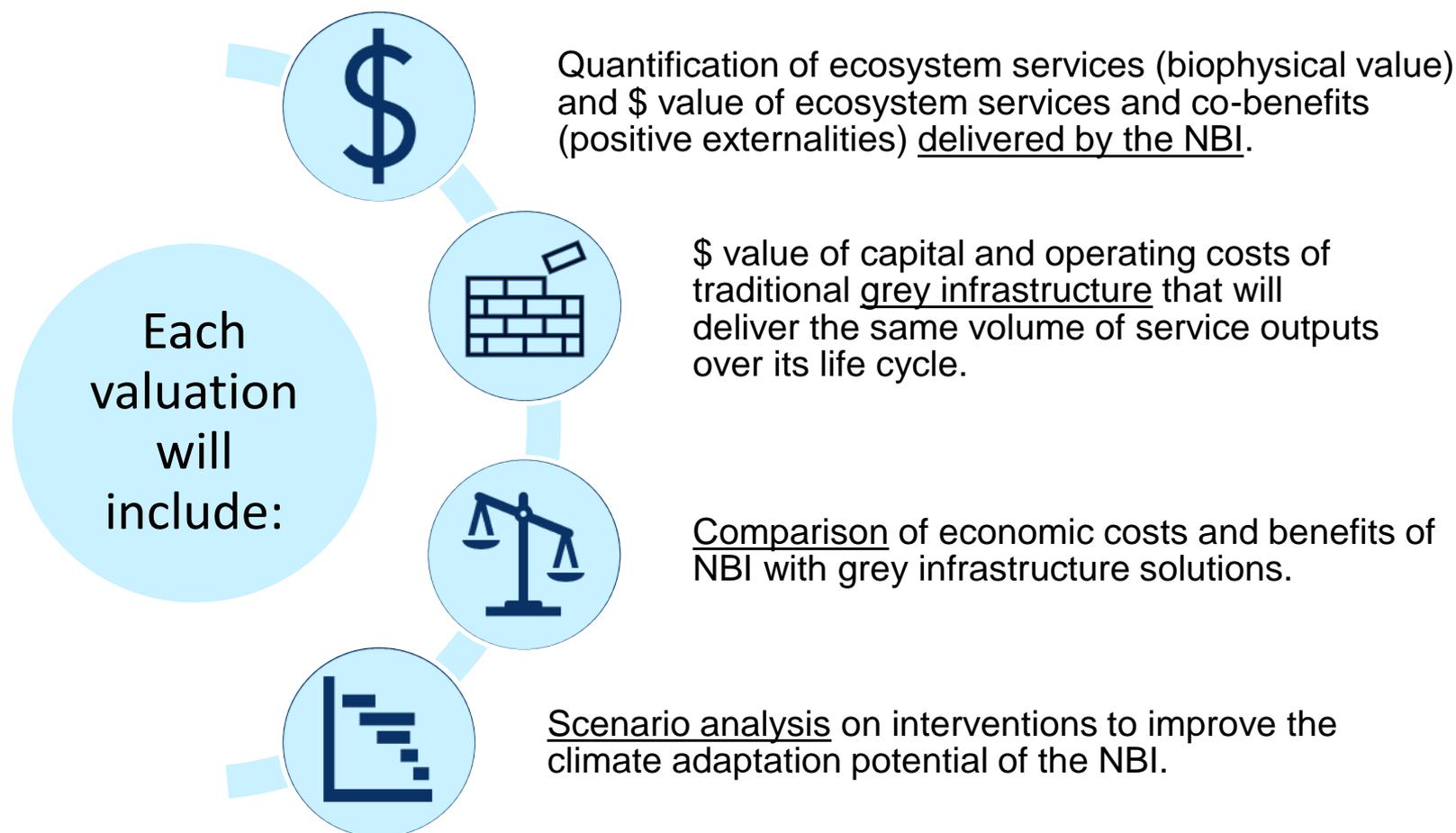
Increased confidence of all market participants in the use and performance on NBI.



Component 1: Valuation of nature-based infrastructure



Customized project valuations



Component 1: Valuation of nature-based infrastructure



What is the simulation methodology that will be used to develop the NBI valuations?

It draws from the Sustainable Asset Valuation (SAVi). The methodology is participatory. All models are co-created with NBI project stakeholders. Its features are:



Based on systems thinking, system dynamics simulation, and project finance modelling.



Customized to each individual nature-based infrastructure project or policy.

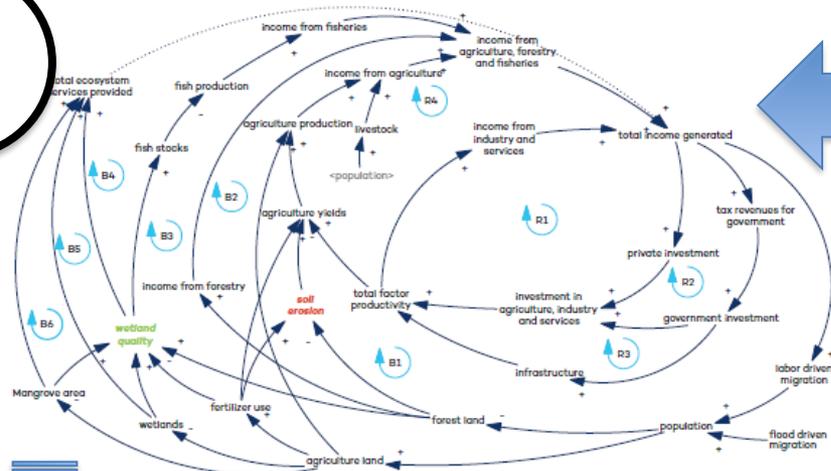


Designed with the input of stakeholders: models are co-created through a multi-stakeholder approach that enables the identification of material risks and opportunities that are unique to the NBI project.



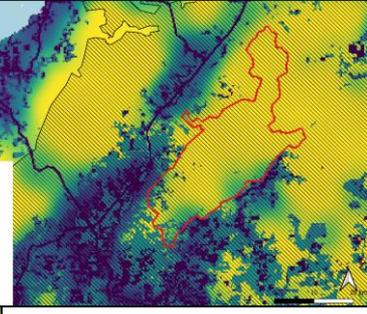
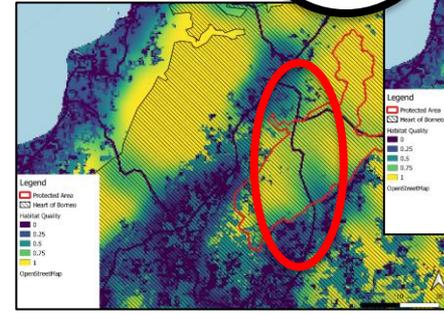
Incorporate best-in-class climate data from the EU Copernicus Climate Data Store.

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Scenario 1

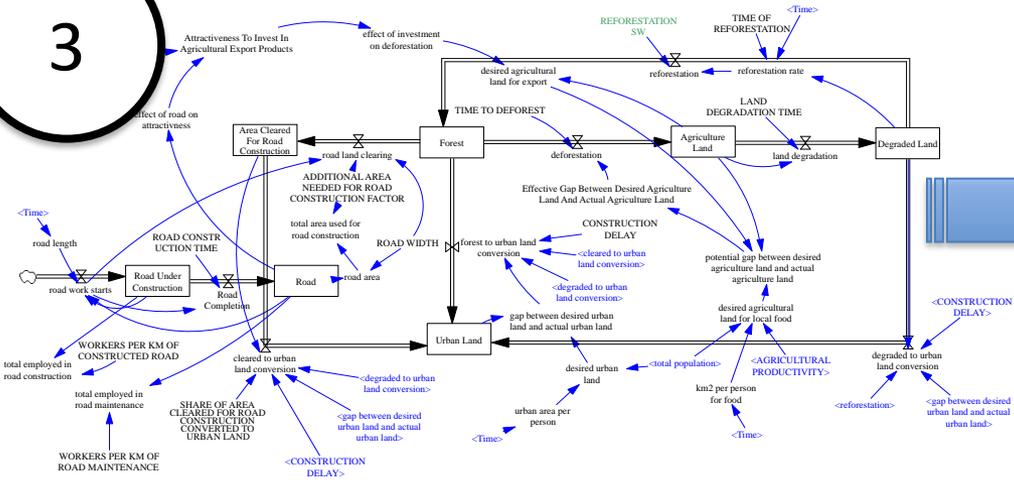


Scenario 2

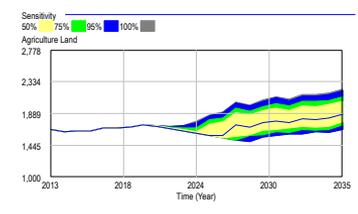
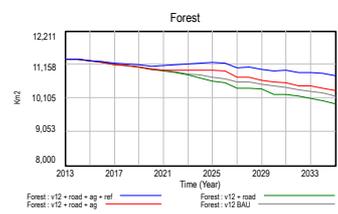
SAVi

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Scenario	Project IRR HPPs (both)	Project IRR Solar PV	Project IRR Onshore Wind
(i) Baseline: Conventional results	9.32%	12.23%	5.09%
(ii) Baseline + cost of dredging	3.15%	n/a	n/a
(iii) Baseline + technology-specific externalities	9.36%	12.50%	5.22%
(iv) Baseline + location-specific externalities	negative	n/a	n/a
(v) Baseline + all externalities	negative	12.50%	5.22%



Component 1: Valuation of nature-based infrastructure



Financial assessment – why is it important?



The financial model demonstrates how **NBI impacts the financial viability of the project**. The modelling will include how cash-flows can service the debt and generate return for shareholders under different levels of NBI integration.



The financial assessment demonstrates the financial impact of internalizing some of the environmental, social and economic **externalities** identified.



Project developers and investors will have access to a **financial assessment** on how nature-based solutions **compare to built infrastructure alternatives** and how they perform under **different scenarios**.



The results of the financial analysis can be the starting point for the **financial feasibility assessment** conducted later in the project development cycle.

Component 2: Online Database



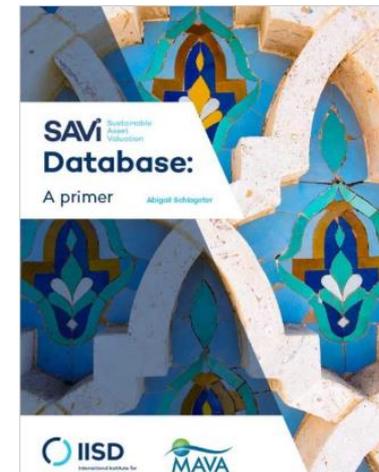
Increase predictability and certainty
related to the performance and use of NBI



Provide open access to relevant data
related to the performance and use of NBI

Subset of externality type	Parameter	Unit
Flood proofing costs based on flood proofing measure	Sprayed-on cement	USD, of wa
	roof membrane	USD, of wa
	ce line around	USD,
	ng check valve	USD,
	nd sump pump (back-up battery)	USD,
	lood shield	USD, of shi
	a flood shield	USD, of shi
		USD,
	Sandbag wall +1 m	

Interactive, regularly updated online database with easily extractable data



Component 3: Capacity Building and MOOC



Per valuation: project-based capacity-building for project proponents and stakeholders



Web-based massive online open course (MOOC)

Component 4: Outreach and Partnership



Objectives

- This component will establish the NBI Resource Center to increase outreach and build partnerships to scale the use of NBI for climate adaptation.

NBI Resource Centre

- The NBI Resource Center will be the main platform for project proponents that seek an NBI valuation. It will include a feature through which interested parties can submit an expression of interest.
- The NBI Resource Center will also host the online database, the MOOC and the publications of the NBI valuations.
- The NBI Resource Center will publish an annual impact report.
- A business plan will be developed to sustain the NBI Resource Centre after the five-year project.



Role of the NBI Resource Centre in the Project Valuations

How will NBI projects be identified and selected for valuations?



- ✓ Valuations will be open to all interested parties.



- ✓ The NBI Resource Center will screen projects based on project selection criteria on a rolling basis.



- ✓ Based on that assessment, the Project Steering Committee will approve projects for valuation.

The Infrastructure Team



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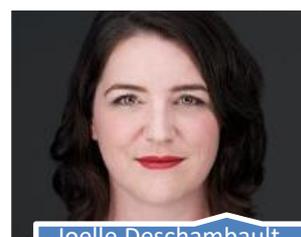
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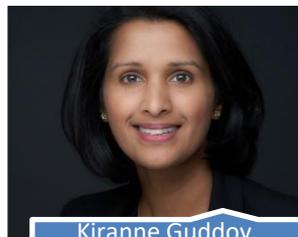
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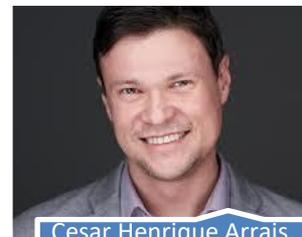
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