



Netherlands Enterprise Agency

Nature and Climate Nexus: Promoting Nature-Based Solutions
for Sustainable Infrastructures in Asia and the Pacific

NbS for Climate Disaster Risk Management

15 September 2022 (Thursday) via Zoom /
2–4 p.m. Philippine Time / 8–10 a.m. Netherlands Time

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- NBS BwN introduction
 - Pilot projects and concepts
 - Enablers
- Practical solutions:
 - Inland buffer zones
 - Vegetated foreshores
- Key messages



Key messages

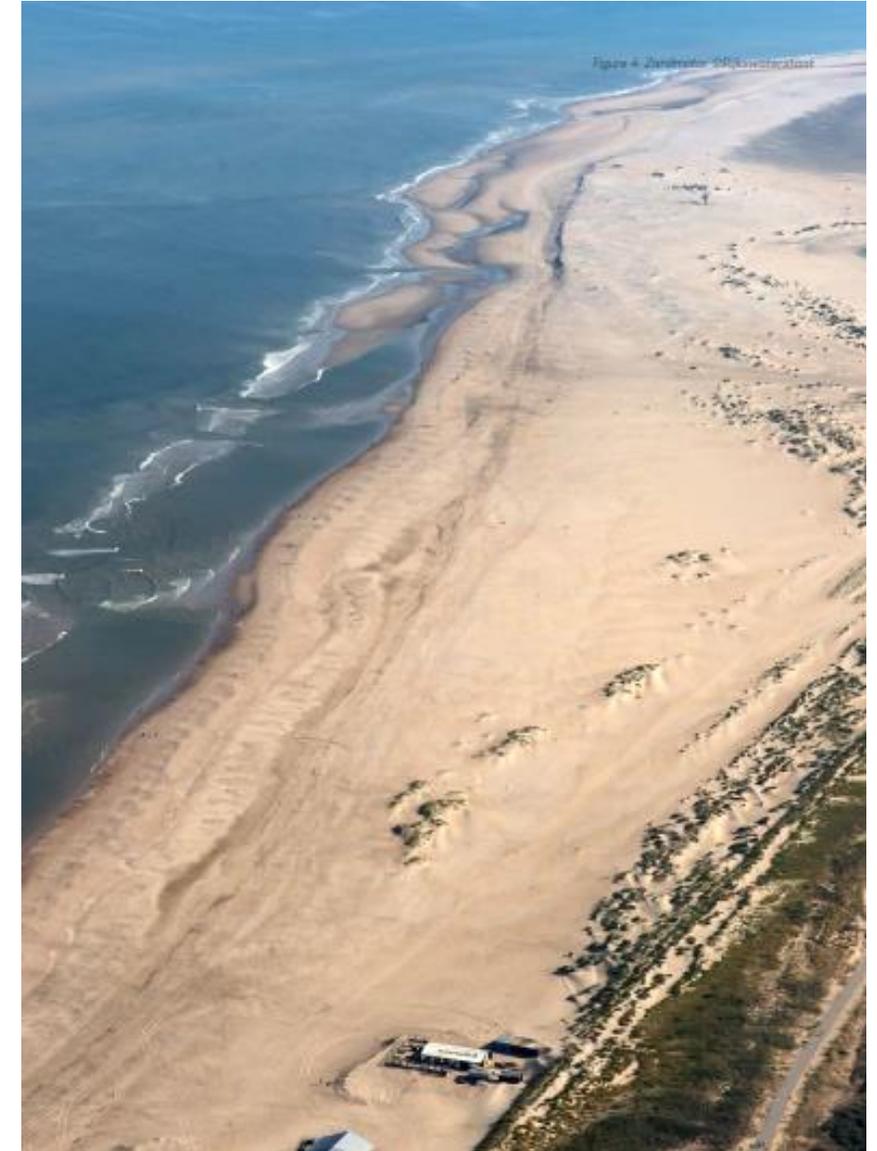


NBS:

- Use all processes: natural (biological and hydraulic), social, economic and institutional
- Require good understanding of all processes, without this knowledge the solutions have a high risk of failure
- Have many benefits as they use the processes instead of fighting them
- Are a good solution in many situations and depend on the available space
- Result in a mix and integration of measure both conventional (hard, gray) and new (soft, green)

NBS is NOT:

- green washing
- the construction of nature areas



NBS - EcoShape BwN - introduction



NBS - Building with Nature started in 2008 in the Netherlands

Paradigm shift:

- ▶ Think differently

In many disturbed environments, man-made projects are an inherent part of the environment, providing a unique opportunity to induce positive change

- ▶ Act differently

Natural processes can be used and stimulated to achieve an optimal and sustainable fit of a man-made project in its environment.

- ▶ Interact differently

Completion of Building with Nature projects can only be achieved through transdisciplinary collaboration and early, active involvement of the stakeholders.



Pilot Project Overview

Nature Based Flood Defences



Houtrib Dike Pilot Project



Sand Motor Delfland Coast



Hondsbossche Dunes



Sand engine lake IJssel



Interreg VB North Sea Region project Building with Nature



NatureCoast

Resilient Delta Cities



Werven Park Dordrecht



Tidal park Rotterdam



CityDeal Klimaatadaptatie

Sustainable Port Development



Living Lab for Mud



Clay Ripening Pilot Project



Building with Nature in Indonesia

Ecosystem Restoration



Salt marsh development Marconi Delfzijl



Mud Motor Koehoal salt marsh development



Marker Wadden KIMA

Concepts



Sandy Coasts



Muddy Coasts



Rivers & Estuaries



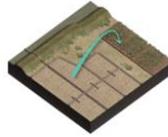
Lowland Lakes



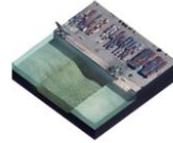
Cities



Ports



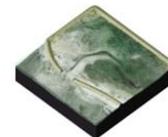
Clay ripening and consolidation



Creating sedimentation basins



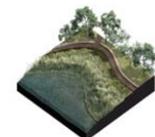
Restoring salinity gradients



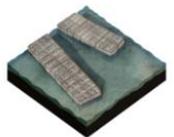
Restoring tidal dynamics



Optimizing flow patterns



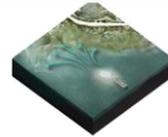
Creating tidal parks



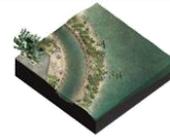
Building shellfish reefs



Restoring connections



Strategically placing fine sediment



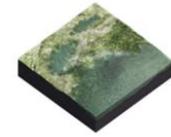
Constructing secondary channels



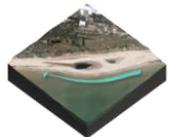
Enhancing dune dynamics



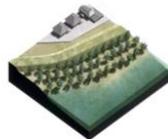
Constructing nature islands



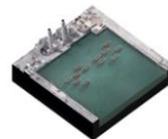
Developing wetland areas



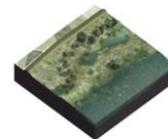
Applying mega nourishments



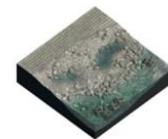
Establishing wetland forests



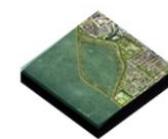
Creating hanging and floating



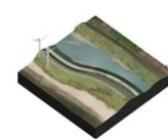
Integrating vegetated



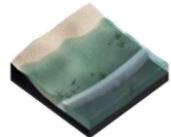
Creating rich revetments



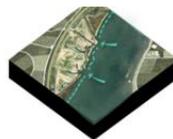
Developing inland buffer zones



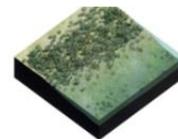
Developing double-levee systems



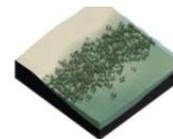
Constructing perched beaches



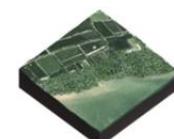
Managing coastal realignment



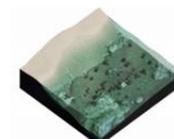
Growing salt marshes



Restoring seagrass meadows



Rehabilitating mangrove belts



Facilitating coral development



Landscaping of the seabed

<https://www.ecoshape.org/en/concepts>



Often asked questions

Often asked questions:

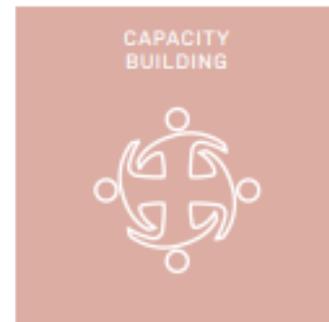
1. Comparison to conventional (gray)
2. What are the economics, co-benefits
 1. Criteria (financial, economic, social, environment)
 2. Area (beyond project area)
 3. Time span (return on investment)
3. Where does the resistance come from





6 enablers

1. Technology and system knowledge
2. Multi-stakeholder approach
3. Adaptive management, maintenance and monitoring
4. Institutional embedding
5. Business case
6. Capacity building



6 enablers



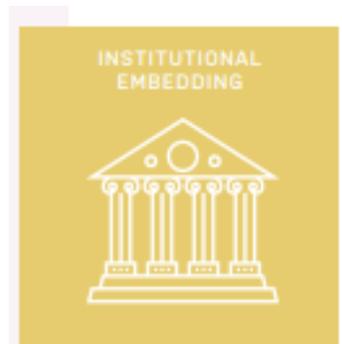
- ▶ Technology and system knowledge:
 - ▶ Large-scale system analysis, comprehension of driving natural processes and natural dynamics.
 - ▶ Various Building with Nature instruments that suit different landscapes.
 - ▶ Building with Nature design approaches and assessment tools.
- ▶ Multi-stakeholder approach:
 - ▶ Cooperation between stakeholders and comprehensive, multifunctional approaches.
 - ▶ Coalition building, co-creation and public participatory approaches to create shared ambitions.
 - ▶ Stakeholder assessment and engagement.



6 enablers



- ▶ Adaptive management, maintenance and monitoring:
 - ▶ Balancing initial efforts/investments (over-dimensioning) against adaptivity and resilience.
 - ▶ Making maintenance strategies an integral part of the development process.
 - ▶ Organisation and techniques for adaptive management and monitoring to deal with natural dynamics at various temporal and spatial scales.
- ▶ Institutional embedding:
 - ▶ Fitting Nature-based Solutions in the existing context, norms, and regulations.
 - ▶ Creating a policy environment that enables conservations laws and formal instruments to be addressed.
 - ▶ Connecting with international enabling policies, including the Paris Agreement, Sendai Framework, AICHI targets, CBD, Ramsar and UNCCD resolutions and SDGs.





6 enablers

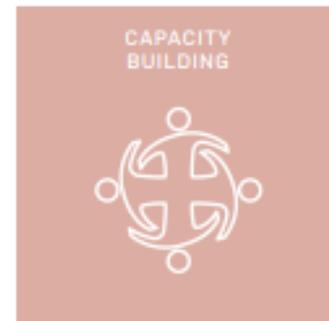
▶ Business case:

- ▶ Defining an optimum business model by integrating conventional engineering and nature conservation expertise with financial knowledge.
- ▶ Improving estimates of maintenance costs and the additional services and benefits (including coastal access, fish production, carbon sequestration).
- ▶ Financing arrangement and pre-requisites (bankable value creation streams).



▶ Capacity building

- ▶ Increasing awareness of the philosophy and possibilities of NBS - Building with Nature.
- ▶ Involving the upcoming generation in Nature-Based Solutions through training and educational programmes.
- ▶ Creating Nature-Based Solutions communities around your project.



Practical solutions – lakes and rivers



- Developing inland buffer zones
- Integrated vegetated foreshores
- Restoring connections
- Growing, restoring marshes
- Developing double-levee systems
- Building shellfish reefs
- Creating rich revetments
- Constructing perched beaches
- Strategically placing fine sediments
- Constructing nature islands
- Creating hanging and floating structures



Practical solutions – inland buffer zones



- Buffer zones and retention areas create capacity to hold stormwater surpluses in cities.
- Connecting buffer zones to regional water systems allows for management and control of water levels in periods of excess and shortage, which will become even more critical as climate change drives weather patterns increasingly toward extremes.
- Large-scale buffers provide an alternative to pumping and drainage systems. Even at a small scale, they can provide valuable ecosystem services to surrounding neighborhoods. In addition to the ecological benefits that come from habitat development, buffer zones create economic opportunity through services including open space, recreation, fishing and aquaculture, floating developments and sustainable energy production.

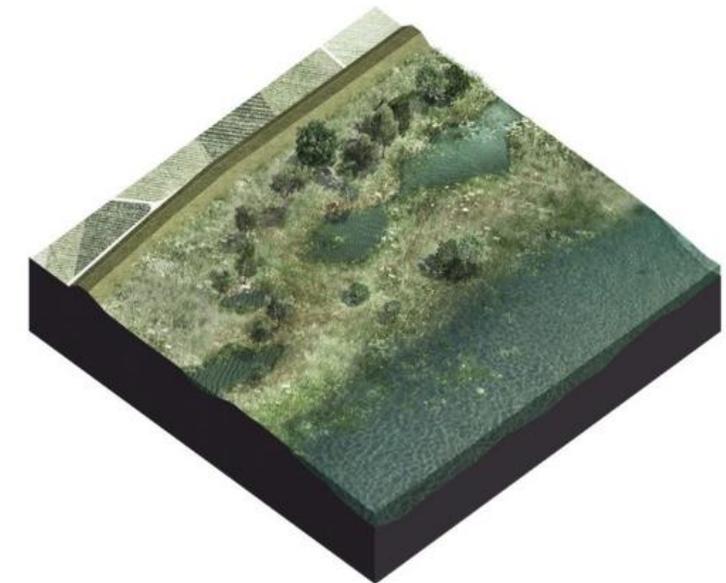


<https://www.ecoshape.org/en/concepts/developing-inland-buffer-zones/>

Practical solutions – vegetated foreshores



- Foreshore environments improve dike resilience and enhance flood defenses by dampening wave forces with their shallow slopes, stabilizing the dike with additional mass and increasing seepage length.
- Vegetation on the foreshore further contributes to wave attenuation and stabilization while creating a range of distinct vegetation zones, which support new habitats and opportunities for recreation.
- In silty environments, foreshores trap sediments and help soil formation, which enables sea level rise adaptation.
- Foreshores require space and their construction does require large-scale earthworks, which must align with local hydrodynamics for long-term feasibility.



<https://www.ecoshape.org/en/concepts/integrating-vegetated-foreshores/>

Key messages

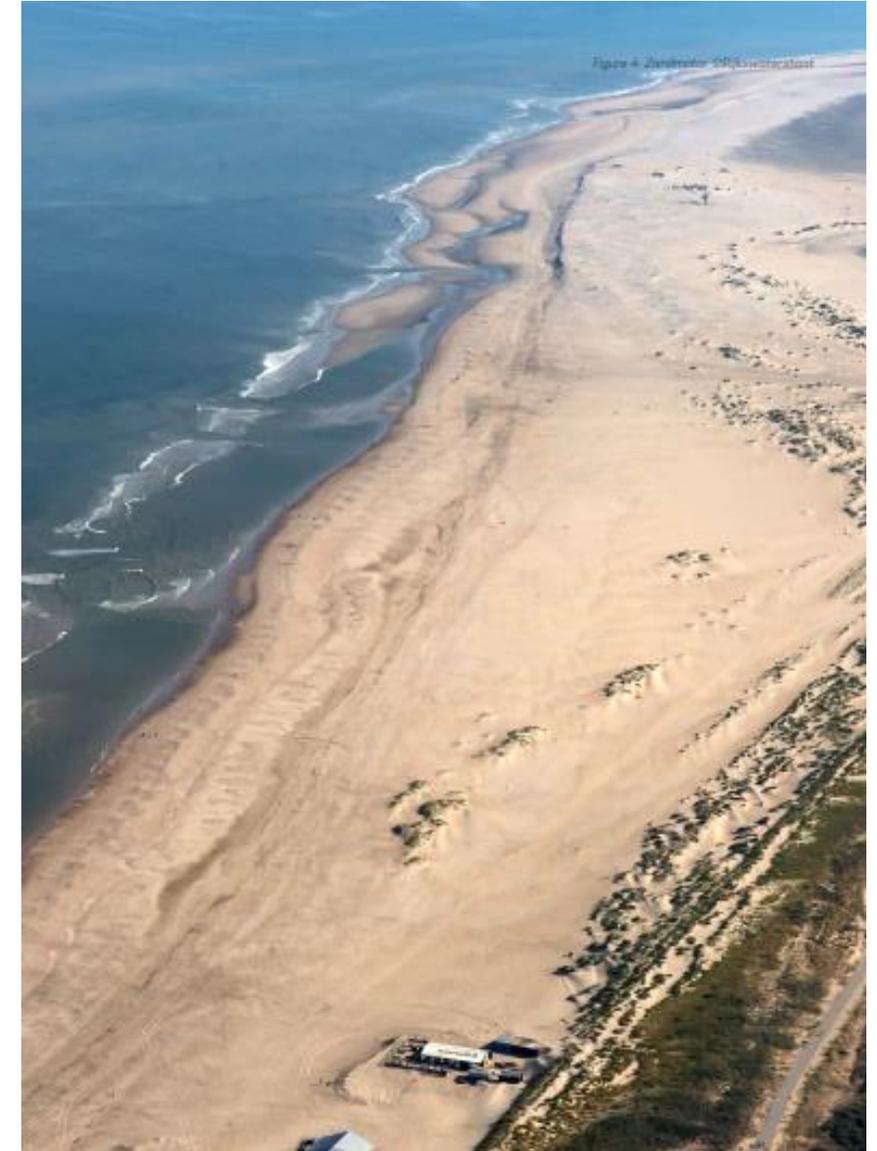


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THANK YOU!

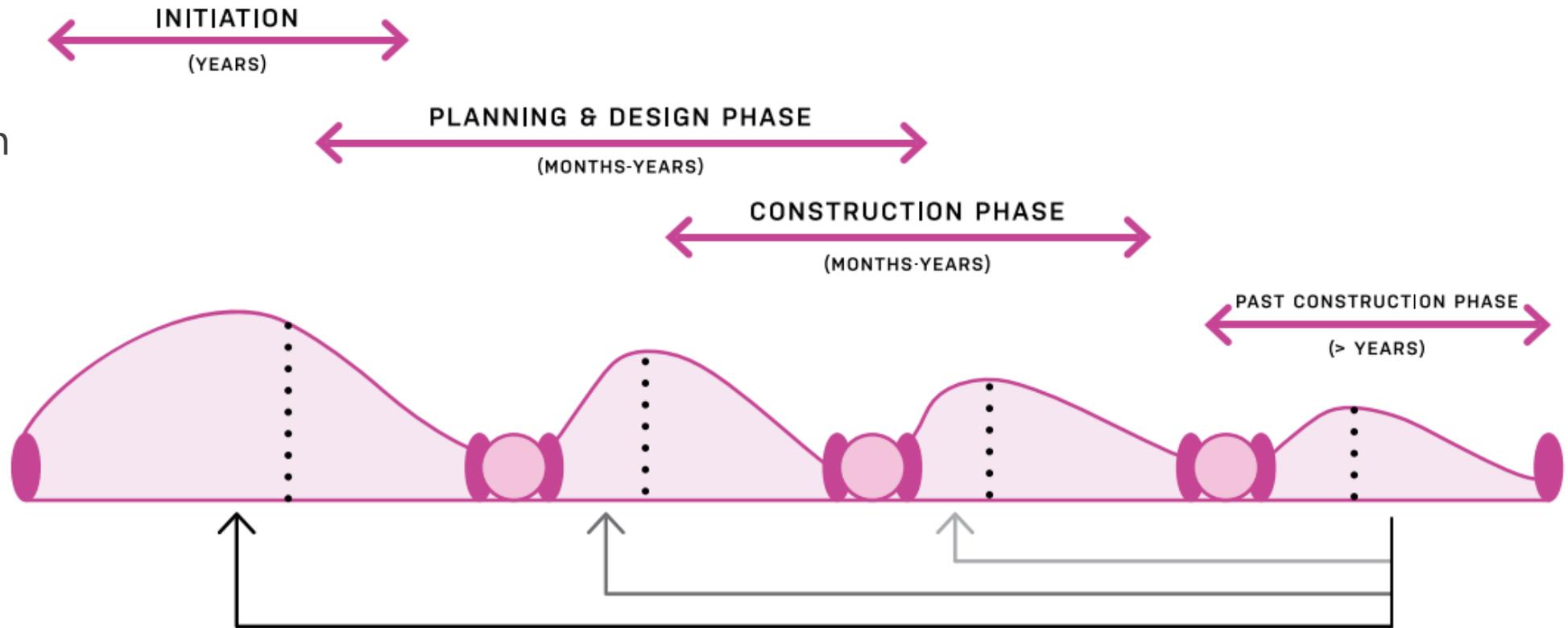
tom.wilms@witteveenbos.com





4 project phases

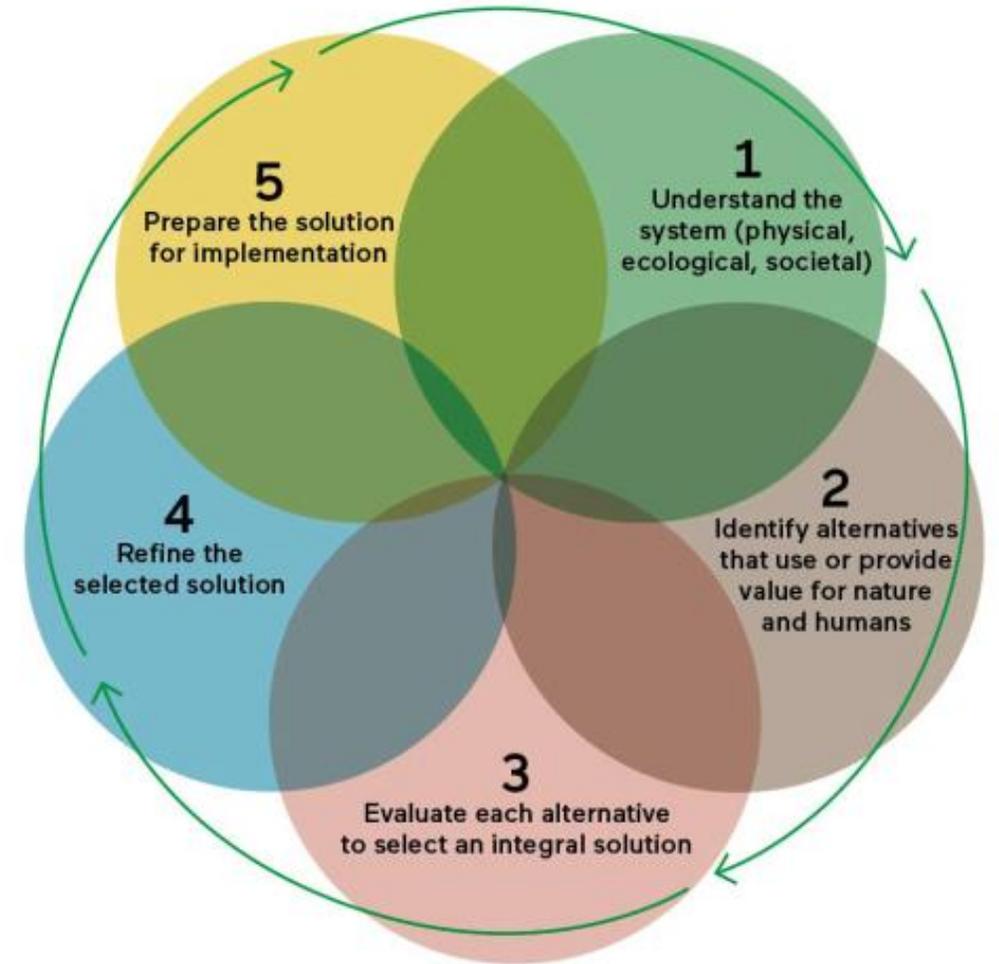
1. Initiation
2. Planning and design
3. Construction
4. Past construction





5 steps

1. Understand the system
2. Identify alternatives
3. Evaluate each alternative
4. Refine the selected solution
5. Prepare the solution for next phase



Practical solutions – restoring connections



- Landscape corridors create important conduits that protect existing habitats and support biodiversity.
- In areas where inland waterbodies have been artificially separated from coastal systems, restored connections can re-establish tidal influence, reconnect urban areas to nature, and facilitate the passage of fish and other species.
- These actions not only support biodiversity, but also help manage the transition from fresh to salt, simulating estuary conditions. Creating blue-green networks in urban areas encourages plant propagation and supports animal communities.
- Building with Nature strengthens connectivity between upland areas and riverfronts, shore to shore, and along river corridors through connected and continuous shoreline habitats.
- <https://www.ecoshape.org/en/concepts/restoring-connections/>

