

Steps and phases

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[Home](#)

**BwN
Approach**

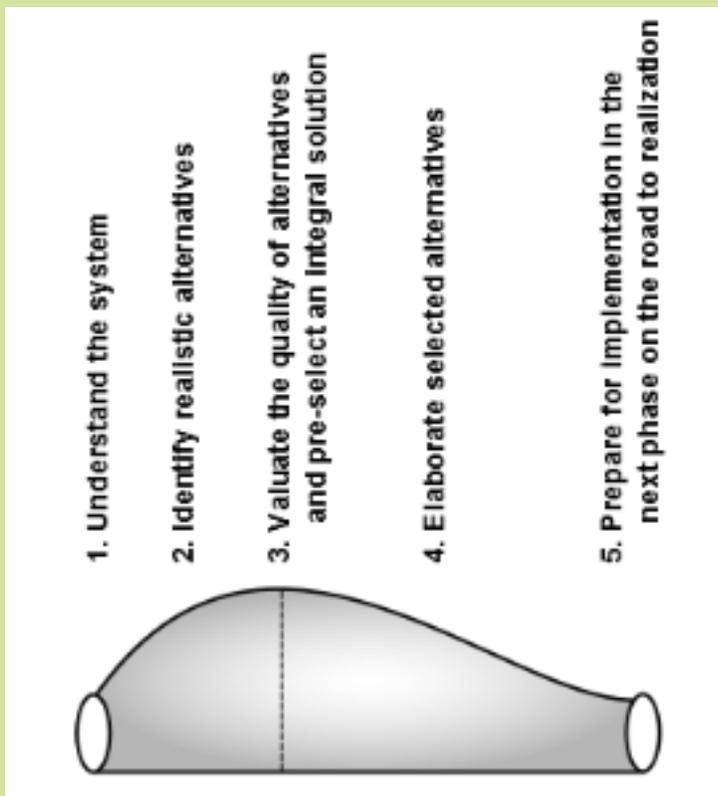
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[Building with Nature Guideline](#) > [BwN Approach](#) > Steps and phases

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Five basic steps for generating Building with Nature designs

Analysis of practical cases has revealed that five steps are invariably taken when developing Building with Nature Designs. The steps together outline a basic creative process that can be followed in any phase of the project realisation process.



Five basic steps for generating BwN Design ideas

Step 1. Understand the system (physical, socio-economical and governance)

Acquire a better understanding of the system in which a project is planned. In depth knowledge of the physical system (biotic and a-biotic), as well as the socio-economic system and the governance context are crucial to identify potential win-win solutions.

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- **The system to be considered depends on the project objectives:** Be clear about the primary objectives and realise that finding win-win solutions creates room for flexibility in catering for secondary objectives. Note that looking at the primary objective alone may restrict the system to be considered. Adding secondary objectives will force consideration of other system characteristics: other temporal and spatial scales etc.
- **Information about the system at hand can be derived from various sources:** It is important to realise is that acquiring knowledge about a system is not a prerogative of scientists. Valuable information can be found everywhere, for instance by
 - talking to people with local knowledge (fishermen, harbourmasters, waiters, elderly people, etc)
 - delving into historical records to better understand the evolution of the system as a whole and to think of approaches that build on historically available expertise
- **Think multifunctional:** Remember to look for user functions beyond those covered by the primary objective.

Step 2. Identify realistic alternatives

Identify realistic alternatives that provide true win-win solutions providing services beyond mitigation and compensation, alternatives that make maximum use of the system's potential (physical, socio-economical and governance-wise) while safeguarding or even enhancing sustainability.

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- **Building with Nature Designs take an inverted perspective:** Turn a traditional reactive perspective into a proactive one (problems are opportunities). This may lead to genuine eye-openers. One way to come up with such innovative 'inverse' ideas is to answer a number of basic questions:
 - **Delivering services to the ecosystem:** How can we strengthen the functioning of the receiving system (ecology, recreation, landscape)?
 - Larger scale: how can a project deliver benefits to the overall system in which it resides?
 - Smaller scale: how can the project (with small adaptations) be more eco-friendly?
 - **Utilizing services provided by the ecosystem:** How can better use be made of locally active (natural) resources: tide, waves, gradients, sediment availability, flora, fauna, economy, cultural values, etc?
 - Can available resources be utilized to lower construction and maintenance costs (more flexible solutions)?
 - Can available resources be utilized to come to more sustainable solutions (PPP solutions: less energy, less material, multi functional)?
 - Can the system's dynamics be used as a positive rather than a negative aspect (utilising natural forces and expected changes as a means to achieve one's goals, use available time to achieve necessary change gradually rather than at once with associated over-engineering)?
- **Solutions are transdisciplinary from the start:** Involve academic experts, field practitioners, community members, business owners, decision makers and other stakeholders in the formulation of alternatives.
 - o Involve all relevant disciplines in the design process as soon as possible (which disciplines should collaborate given the system at hand, how should they collaborate in order to be most innovative/effective)
 - Seek open-minded rationality, open to the unknown, the unexpected and the unforeseeable while rejecting dogmatism, ideology and intolerance (see also Wikipedia: [Transdisciplinary studies](#)).

Step 3. Valuate the qualities of alternatives and pre-select an integral solution

Assess the inherent qualities of the alternatives and combine them into one optimal integral solution. Valuate the BwN alternatives and compare them with traditional designs.

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- **More value does not imply higher construction cost:** When looking for win-win situations, small adjustments to an existing design may produce more value for less or equal money.
 - More for less is possible! Try to get great value gain with little investment.
- **Creativity pays off:** Dare to embrace innovative ideas, test them and show how they work out in practical examples.
 - Tell the story of successful implementation of creativity
- **Uncertainties must be identified and handled:** Building with Nature solutions by definition involve natural dynamics and inherent uncertainties. Handling these uncertainties is a normal part of the Building with Nature Design process.
 - Remember that, although a solution as a whole may be innovative, its components may be based on traditional know how.
- **Involve stakeholders in the valuation and selection process:** From Negative to Positive, from NIMBY (not in my back yard) to PIMBY (please in my back yard)!
- **Perform a cost-benefit analysis:** Take into consideration construction costs and maintenance costs, as well as benefits for all functions involved. Compare the BwN-solution with a traditional (usually mono-functional) one.

Step 4. Elaborate selected alternatives.

Elaborate selected alternatives considering practical restrictions and governance context.

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- **Consider the conditions/restrictions provided by the project:** Make sure that an innovative idea is elaborated in such a way, that it may actually be constructed.
 - Take execution aspects into account (work methods, availability of equipment, etc)
 - Identify important timing aspects (growing seasons, closed seasons, time for ecological components to evolve to desired state, etc.)
 - Tell the story. If you have proceeded to implement an innovative idea, make sure that you tell your story to the project team, the stakeholders and the public. Think of access routes to a project, guided excursions, information panels, press releases, media coverage, etc.
- **Implementation of solutions requires involvement of a network of actors and stakeholders:** such a network needs to be established
 - Effectively involve stakeholders in the design and realisation process
 - Use existing examples that people can use as inspiration, as building blocks for future projects. Solutions should be of an 'open source' nature. In networks ideas cannot and should not be protected, but open to use by others. Share costs, expertise and ideas. Don't be possessive.

Step 5. Prepare the solution for implementation in the next phase on the road to realisation

Handle the practical bottlenecks to get the solution included in the next phase on the road to realisation: inclusion in request for proposals, inclusion in the detailed design, inclusion in the project delivery, inclusion in maintenance and monitoring scheme.

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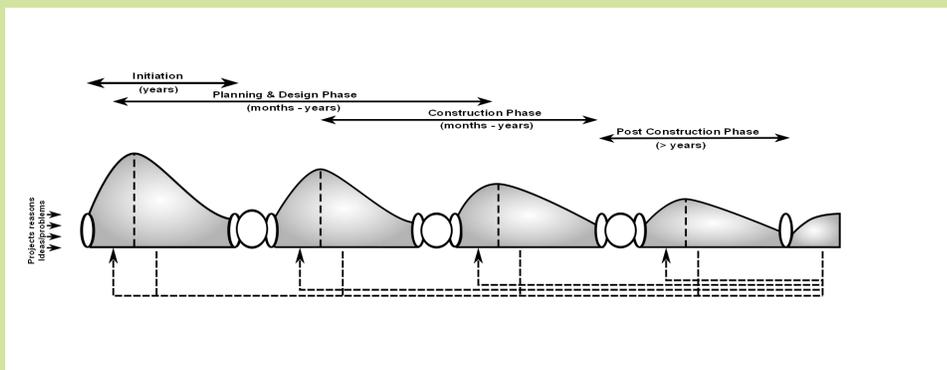
- **Translate solution to a technical design:** What would you need to actually implement the proposed solution (lacking knowledge, available materials, sustainability criteria etc.).
- **Translate solution to request for proposals or contract:** How to reformulate the request for proposals (TOR) so that the innovative solution will be proposed or constructed.
- **Organise required funding:** Try to involve stakeholders in the search for additional funding if required.
- **Identify permitting requirements:** Identify as soon as possible potential bottlenecks in terms of permitting and organise necessary input (required knowledge, required support by stakeholders).
- **Prepare risk analysis and contingency plans:** Building with Nature is dynamic almost by definition. Make sure the project takes this aspect into consideration (adaptive execution, adaptive management)

Practical approaches to realisation phases

The Five Steps to develop BwN alternatives can be applied throughout the project realisation process. Each project phase, however, has its own specific focus. This section briefly addresses each project phase indicating topics that deserve increased attention in relation to Building with Nature Design. Project development, though a cyclic process, generally goes through a number of consecutive phases. Building with Nature Design may be introduced in each project phase in the form of ecologically preferable and more sustainable approaches. The earlier the approach is embraced in the project development process, the greater the potential impact.

Numerous project life cycle descriptions exist. The Building with Nature programme adopts a definition distinguishing the following phases:

- [Initiation](#)
- [Planning and design](#)
- [Construction and](#)
- [Operation and maintenance](#)



Overview of the project realisation phases

During each phase opportunities for integration of BwN solutions do exist, with maximum potential and flexibility in the earliest stages of development. To optimally 'seize opportunities', a life-time analysis is encouraged, considering information on BwN potentials from later phases in earlier phases.

Initiation Phase

Building with Nature Design may be introduced in a project development process as early as the Initiation Phase. The Initiation Phase deals with a first definition of the problem or opportunity at hand and the scoping of potential solutions.

Building with Nature approach: wider and greener scope

System Approach: the BwN approach takes a wider perspective and aims for multiple objectives, i.e. strives for benefits to other functions, such as nature, recreation and other ecosystem-dependent functions. Applying BwN-principles as early as the Initiation Phase will have the largest influence on the end result.

Traditional approach: sectoral, narrow scope

Project Approach: traditionally, the initiation phase is characterized by a sectoral approach, a limited and mono-functional problem perception and a tendency to jump to solutions. Tradition plays an important role. Already in this early stage of development a usually narrow project framework is defined. This can be due to the problem-owner's/project-initiator's objectives or limitations, or to authorities biased to certain classes of problems and solutions.

Planning and Design Phase

Where the Initiation Phase focused on the problem definition and project scope, the more detailed Planning and Design Phase deals with developing alternative strategies within this given scope and handles the selection of the preferred alternative(s).

Building with Nature approach: wider and greener scope

The BwN approach focuses on utilising natural processes and stimulating nature development as an integral part of the strategies to be developed. Key questions are what the project can do for nature, as well as what nature can do for the project. Foci of attention are the longer term, incremental development and adaptive management. Financing strategies may be an integral part, as ecosystem services may open doors to potential funding sources.

Traditional approach: sectoral, narrow scope

The Planning and Design Phase aims to develop strategies to achieve the objectives described in the Initiation Phase. Traditionally, strategies focus on solving a narrowly defined problem within a given timeframe. Opportunities for adaptive management, incremental development and nature inclusive designs are seldom considered.

Construction Phase

In previous phases the problem definition, project scope, project strategy and design have been addressed. The construction phase elaborates and discusses the project execution approach. EDD can be used to optimize the work method and the selection of materials.

Building with Nature approach: wider and greener scope

Eco-dynamic projects aim to jointly optimize the cost-effectiveness of a project, its embedding in the natural environment, the use of natural processes and the creation of new opportunities for nature. Careful selection of materials and optimisation of the layout can yield significant advantages. Involvement of stakeholders in this optimization process may help to turn hesitation and opposition into enthusiasm and cooperation. Room for experimentation and adaptive project development and management are important elements.

Traditional approach: sectoral, narrow scope

Traditionally projects are optimized in the construction phase by minimising construction time, costs and risks. Delivering the required functionality within these constraints is considered optimal. Aspects considered are reuse of materials that can reduce construction cost, cost-effective timing of construction activities, functional combinations with other projects, financial constructions, optimizing of operation and maintenance with design aspects. There is a tendency to use proven technologies in order to reduce risks.

Operation and Maintenance Phase

The application of Building with Nature Design is extended as far as the Operation and Maintenance Phase. Considering maintenance aspects early on in the design process may optimize the design and reduce lifecycle cost significantly. But also Operation and Maintenance an BwN approach may lead to forms of adaptive management and development that will generate additional environmental and cost benefits.

Building with Nature approach: wider and greener scope

The BwN approach incorporates the possibility of incremental adaptation to changes in system dynamics, environmental conditions or operation practices. Objectives and functioning are not fixed indefinitely, but leave room to seize new opportunities. Building with Nature does not aim at fixing habitats of a preset number of individuals of a certain species, but rather respects natural system dynamics.

Traditional approach: sectoral, narrow scope

Operation & Maintenance are about keeping the structure of the facility in its original state and functioning as intended. Often traditional approaches lead to regular, more or less identical interventions with little attention for possible adaptive management or incremental development. Such interventions are often more expensive than an incremental approach and they usually have greater environmental impact.

[Back to Top](#)