

# **Building with Nature opportunity mapping**

## **Discussion paper for the Interreg Building with Nature project**

Deliverable 5-3  
Date: 17 July 2020  
Status: Final

# Colophon

## Building with Nature Business Guidance Report

Deliverable 3 of Work Package 5 - Upscaling: business case development and opportunity mapping, part of the INTERREG Building with Nature project.

<http://www.northsearegion.eu/building-with-nature/>

### *Authors*

Arcadis – Floris Groenendijk, Jessica Bergsma

Deltares – Sien Kok, Stéphanie IJff

RoyalHaskoningDHV – Simeon Moons

### *WP5 Project Leader*

EcoShape – Erik van Eekelen

June 2020



## Contents

<b>Introduction .....</b>	<b>4</b>
<b>Indicators for BwN opportunity.....</b>	<b>4</b>
<b>Results from the BwN Interreg project .....</b>	<b>6</b>
<b>Conclusions .....</b>	<b>13</b>

## INTERREG Building with Nature project

The INTERREG Building with Nature (BwN) project demonstrates BwN solutions that utilize natural processes to deliver flood risk and coastal erosion management whilst enhancing ecosystem services. The overall objective of the INTERREG BwN project is to make coasts, estuaries and catchments of the North Sea Region more adaptable and resilient to the effects of climate change through the use of BwN measures. INTERREG BwN creates joint transnational monitoring programmes, uses state-of-the-art analysis methods, develops improved designs and business cases for BwN solutions.

This report is a deliverable of Work Package 5 'Upscaling: business case development and opportunity mapping'. The objective of WP 5 is to: 1) show available methodologies for business case development and valuation; 2) provide guidance for BwN concepts to approach business case development; and 3) to demonstrate opportunities of BwN by giving good examples of business cases for BwN. This report provides observations and discussion points regarding opportunity mapping and the role of Business Cases therein.

Project website: <https://northsearegion.eu/building-with-nature/>



## Introduction

In the BwN Interreg project, successful implementation of Building with Nature (BwN) is illustrated by the numerous BwN laboratories. During the project, the partners have gained knowledge about the success factors and barriers for implementing BwN. Can we apply this knowledge to identify new opportunities for BwN in other locations? This document presents the lessons learned, to assess BwN opportunities in other locations. This is a deliverable of the project activity 'opportunity mapping', together with the deliverable 'Opportunity map' that shows the locations of these new BwN opportunities.

Opportunity mapping can be used to convince decision-makers in a flood-prone area to consider BwN as a solution, and to steer actions and funds towards the most promising regions ('low hanging fruit'). On a smaller (local) scale, opportunity maps can be used in the BwN implementation cycle to inform decision-makers and practitioners about the best location in the project area to implement the preferred BwN measure.

The lessons learned are derived from local (pilot) projects. As such, they are applicable within a certain context and cannot be automatically transferred to other situations. Here, we have tried to translate the lessons learned into more generic indicators for BwN opportunities. However, there will always be a trade-off between context-specific versus generic success factors and barriers for BwN implementation, since too generic lessons can lose part of their value.

## Indicators for BwN opportunity

Locations of interest to assess the opportunity for BwN are the areas with an urgency for flood control or a need for climate change adaptation. The physical system or ecosystem determines what type of BwN could be applied. Feasibility is among others dependent on scale, strategy level, and infrastructures already in place. When ideas have been gathered and a vision has been developed, the opportunity for BwN can be assessed by looking at the governance indicators. Relevant governance indicators are: Cost-effectiveness, additional benefits, financing opportunities, legal constraints, institutional capacity and public support.

### Urgency

Which areas face a high flood risk? These locations are of interest to assess opportunities for BwN implementation. The three major types of floods are: storm surge, river flood and flash flood. When there is already a flood risk infrastructure in place, BwN opportunities can be found by locating areas where refurbishment of existing infrastructure is needed, or where flood risk measures can be combined with environmental objectives. In addition to urgency, a need for climate change adaptation indicates an opportunity for BwN. Especially because some BwN measures do not take effect quickly, such as developing a forest, salt marsh, dunes or reef.

## **Physical system**

The physical system or ecosystem largely determines what type of BwN could be implemented as flood reduction measure. For example, a salt marsh can develop in a muddy and tide-dominated estuarine system, but it will not develop in a sandy and wave-dominated coastal system. In catchment areas, BwN measures include leaky barriers to slow down water flow upstream and widening the flood plain area ('room for the river') to increase the river discharge capacity downstream. As BwN solutions often need space to absorb wave energy and store water, they are most effective in areas with a low slope and a large spatial scale. In cases with a moderate slope and/or a smaller space (such as in urbanised areas), hybrid solutions can be an effective alternative.

## **Governance indicators**

As for all infrastructure projects, cost-effectiveness is an important success indicator for BwN implementation. First, the proposed BwN solution needs to be effective in relation to the primary goal (e.g. flood risk reduction). Second, the question is if the proposed BwN solution is cost-effective compared to a conventional alternative, based on lifecycle cost analysis (including investment, operation and maintenance costs). Other benefits, additional to the primary goal (e.g. nature values and recreation) can form an extra argument to choose for the BwN option. Moreover, it can help in finding funding sources. When the existing funding framework for flooding and erosion reduction is not suitable to fund BwN over conventional alternatives, additional or new funding sources or financial mechanisms need to be identified, i.e. by (local) actors willing to pay for (co-) benefits.

Next to cost-effectiveness and financing opportunities, legal constraints and institutional capacity are important indicators to assess the opportunity for BwN. For example, negative environmental or social effects during and after the implementation of the proposed BwN measure (e.g. emissions, resettlement/ land ownership) could form legal barriers. Moreover, the institutional infrastructure (division of tasks and responsibilities) should be in line with implementing a BwN solution: Is it clear who is responsible for what and does each entity have sufficient capacity in terms of financial resources, human resources and expertise? Last, public support is essential to successfully implement BwN. Are there any stakeholders that might oppose the proposed BwN measure and (how) can these oppositions be overcome?

It is important to realize that these governance indicators do not determine if BwN can be applied or not but give an indication of potential success factors or barriers. Once these are identified, they can be used in the policy dialogues and stakeholder process to find a strategy to overcome these potential barriers.

## Results from the BwN Interreg project

For this document, BwN Interreg partners have filled in a questionnaire with governance indicators for their specific region. The results show how some indicators are considered more relevant for identifying BwN opportunities than others, though this is highly region or situation dependent. A summary of the results is given in table 1. The topic was further elaborated on in a workshop with the BwN Interreg partners<sup>1</sup>. During this workshop the results of the questionnaire were discussed in the form of three statements and two questions.

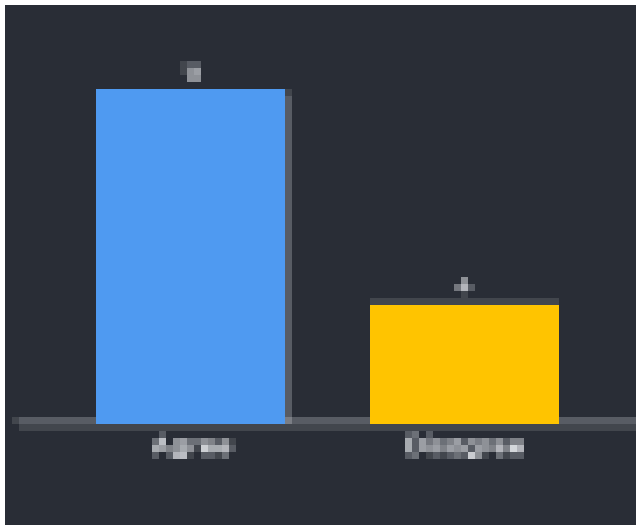
Table 1: Overview of the received input from the partners

Questions	Summary of the answers
1. What is the general case or storyline behind the BwN solution?	BwN serves multiple functions whilst maintaining or restoring natural system.
2. What is the primary goal of the BwN solution?	Flood risk reduction, maintaining the coastline and improvement of the ecosystem functioning.
3. Is the BwN solution effective in relation to the primary goal?	Yes.
4. Is the BwN solution cost-effective, compared to a conventional alternative, based on lifecycle cost analysis?	Yes, or unclear, because lifecycle cost-benefit analyses are lacking.
5. What additional benefits does the BwN solution deliver?	Tourism, a healthy ecosystem and ecosystem services.
6. Which prospects are there for financing the BwN opportunity? a. Is the existing funding framework for flooding and erosion reduction suitable to fund BwN over conventional alternatives? b. If not, can additional/ new funding sources and/or financial mechanisms be identified, i.e. by local actors willing to pay for (co) benefits?	a. Yes, if the direct benefit through flood risk reduction is clear. b. Government (tax) and/or non-profit NGO's.
6. Are there negative environmental or social effects during and after the implementation of the BwN opportunity?	Environmental legislation is a barrier but can be overcome.
7. Is the institutional infrastructure in line with implementing a BwN solution?	Responsibility for flood protection is often clear, but additional benefits are out of the scope. Therefore, capacity is lacking.
8. Are there any stakeholders that might oppose the BwN and (how) can these oppositions be overcome?	Clear communication towards stakeholders and proof of concept is needed.

<sup>1</sup> <https://northsearegion.eu/building-with-nature/partners/>

**Statement 1: The need for flood protection is more important in assessing a BwN opportunity than additional benefits.**

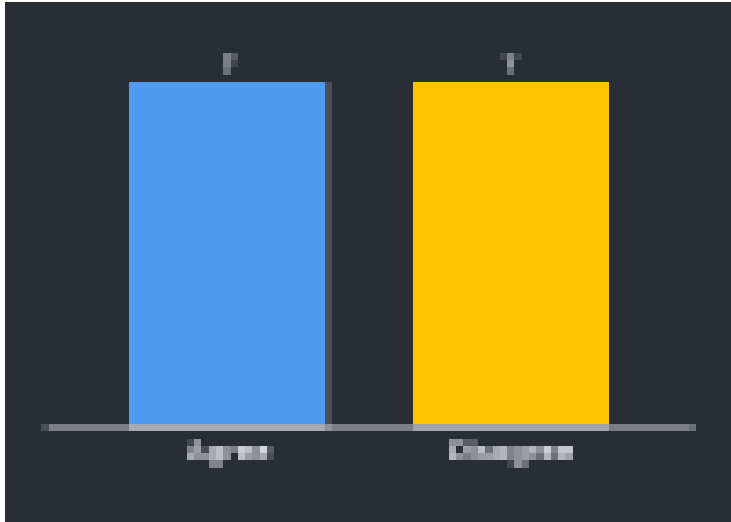
*Voting figure:*



The need for a certain measure must be identified before a project can be started. The bigger the need and urgency, the more likely a measure will be taken. For opportunity mapping, it is therefore very important to identify the need and assess its urgency and gravity. This will also help to identify the primary and secondary goals of the project. The poll results show that the reason to implement a BwN measure is usually based on a need for flood protection or climate adaptation. The gravity and urgency of these needs usually outweighs other needs and enables the funding for a project, hence it is set as the primary goal of a project. However, what distinguishes the opportunity for a BwN measure from a conventional measure is the presence of other needs: Environmental or social. Identifying additional benefits should therefore not be neglected. In some cases, the sum of additional benefits might even outweigh the need for flood risk reduction and the primary incentive for funding the project can shift, for instance towards habitat restoration or water quality improvement. In fact, for some BwN Interreg projects flood risk reduction is not the primary goal but an additional benefit. The questionnaire results showed that this is the case for BwN measures in the Rån river (Sweden) and in the Louwersmeer Dyke (Netherlands).

**Statement 2: Governmental taxes are more promising to finance future BwN cases than non-profit NGO funds or private investors.**

*Voting figure:*



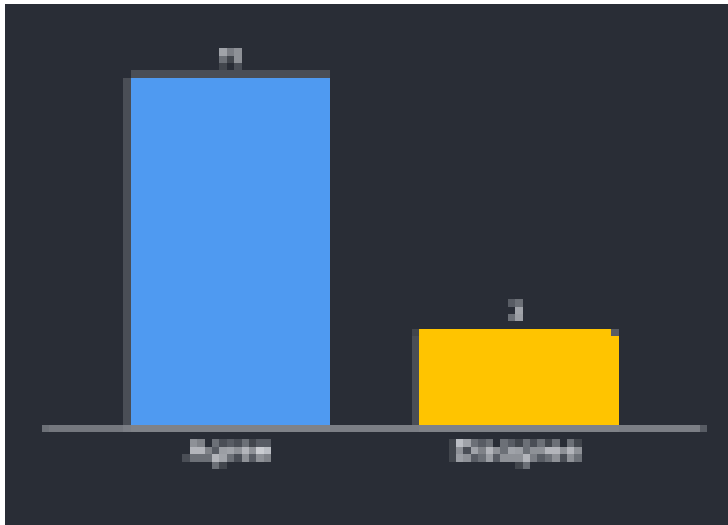
Funding a BwN solution can prove to be a barrier for implementation and should therefore be an important part of opportunity mapping. The initial investment required to implement a BwN measure can be quite large, requiring some form of collaboration between stakeholders or institutional governance. Furthermore, if BwN proves to be the best solution based on additional benefits, but more costly than a conventional measure to reach the primary goal, the primary actor might not be willing to pay, or has insufficient means to do so.

How to cope with these financial challenges is very location specific. In many cases governmental taxes are most promising to finance BwN. On a national or regional level, this may be a matter of collaboration between departments and redistributing financial means from existing taxes (which can be a challenge in itself). However, BwN Interreg partners state that if this requires a direct increase in local taxes it might not be accepted, even when a better result is accomplished with the BwN measure. This is reflected in the poll results, where 50% agrees with the statement, while the other 50% disagrees. So, taxes are not always a solution for financing BwN. It is therefore important for opportunity mapping to identify both the governmental funding capacity, as well as alternative funding sources. Non-profit NGO funds or private investors that are willing to pay for either the primary goal or the additional benefits can form alternative funding sources. Local crowdfunding might also be an interesting alternative. Cashing-in additional benefits and convincing the profiting actors to invest early on seems to be the fairest means of funding. However, this is very challenging, since it requires a detailed cost-benefit analyses, a good evidence base and a willingness to collaborate and make investments from several actors. This will of course be easier for small-scale measures than for large and complex measures.



**Statement 3: A healthy ecosystem is a more important benefit for BwN than increasing tourism (while considering a BwN opportunity).**

*Voting figure:*

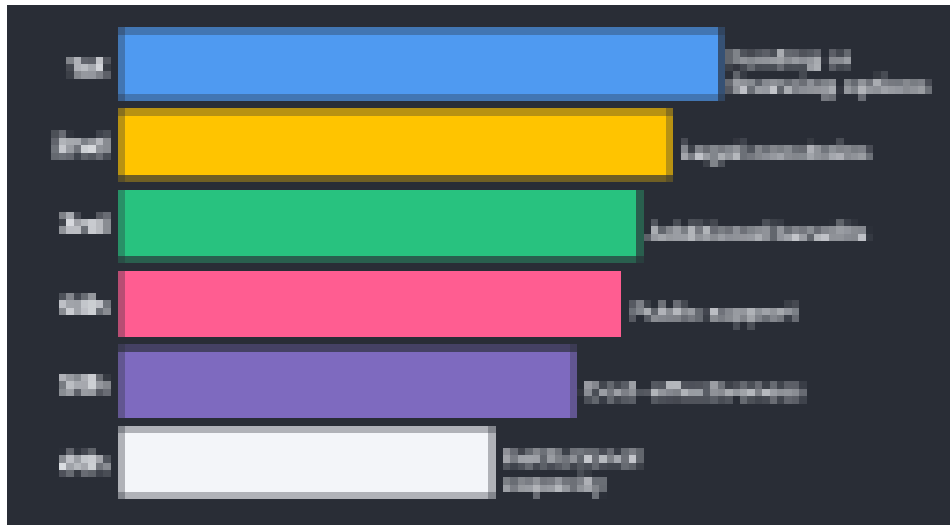


A healthy ecosystem is valued very highly by the BwN Interreg partners. In essence a BwN approach should always result in an eco-friendlier solution than a conventional alternative. Ideally, if the incentive for ecosystem restoration or creation is high, the solution could improve the local ecosystem health. This will in turn have a positive effect on the provisioning of many ecosystem services. One of these ecosystem services could be tourism. This causal relationship forms a strong argument for prioritizing ecosystem health above tourism. Furthermore, there are (BwN) cases where tourism plays a minor role and indeed could even oppose environmental goals and benefits. In terms of opportunity mapping, identifying a need for ecosystem restoration, quality improvement of environmental parameters, or ecosystem functioning (for natural flood protection) is very important for making a BwN case.

However, as pointed out during the workshop, there are also examples where tourism is a very important benefit of the BwN measure. This is most apparent at the sandy beaches near urban areas. A BwN solution can have a direct and almost immediate effect on increasing or maintaining tourism. This will make it more attractive to stakeholders and thus more likely to be implemented. This may also increase the likelihood to find financial investors and is thus an important parameter for opportunity mapping.

**Question 1: What information should be known beforehand before a BwN opportunity can be mapped?**

*Voting figure:*



*Voting statistics:*

Items	1st place	2nd place	3rd place	4th place	5th place	6th place	Total votes
<b>Public support</b>	1	2	3	1	0	0	<b>7</b>
<b>Legal constraints</b>	3	2	1	0	0	2	<b>8</b>
<b>Institutional capacity</b>	2	0	0	1	3	2	<b>8</b>
<b>Cost-effectiveness</b>	1	2	0	3	1	1	<b>8</b>
<b>Additional benefits</b>	2	0	3	1	2	1	<b>9</b>
<b>Funding or financing options</b>	1	3	2	2	1	0	<b>9</b>

Although the voting figure shows a clear ranking of the different factors to inform mapping of BwN opportunities, the statistics tell us that there is a high variety in how the BwN Interreg partners have ranked each option. The main conclusion is therefore that all these factors can be important for BwN opportunity mapping, and the local context will determine which ones are most relevant.

Overall, 'Funding or financing options' is ranked as most important factor to inform BwN opportunity mapping. During the discussion it became clear that the BwN partners were surprised by this outcome, because most participants indicated that they had placed another option at the first place. The voting statistics show that 'Funding or financing options' was

mostly ranked as a second, third or as fourth option. Bases on the discussion with the BwN partners and by looking at the statistics, it can be concluded that knowing the (various) options for funding or financing the BwN measure beforehand is important when considering BwN opportunities.

'Legal constrains' are placed as second important factor in mapping BwN opportunities. During the workshop it became clear that legal constrains can have a large impact on the BwN opportunity. Therefore, all partners indicated that it is important to know the legal constrains beforehand, when considering BwN opportunities. 'Additional benefits' and 'public support' were ranked third and fourth on average. In the discussion it became clear that public support can be increased by adding 'additional benefits' in a BwN solution. In the workshop the 'institutional capacity' was also mentioned to be important, even though it was ranked 6<sup>th</sup> in the voting figure. If there is no capacity within the executive institute, it becomes hard to explore BwN opportunities.

**Question 2: How can we increase the number of BwN cases in the future?**

Voting figure:



Voting statistics:

Items	1st place	2nd place	3rd place	4th place	5th place	6th place	Total votes
<b>Make governments responsible for flood protection</b>	2	0	0	1	0	0	<b>3</b>
<b>Make local municipalities responsible for flood protection</b>	0	0	1	1	1	0	<b>3</b>
<b>Increase taxes for flood protection</b>	0	0	1	0	1	0	<b>2</b>
<b>Convince stakeholders with proof of BwN effectiveness</b>	6	3	0	0	0	0	<b>9</b>
<b>Focus on additional benefits for stakeholders</b>	2	5	1	0	0	0	<b>8</b>
<b>Other, please explain</b>	0	1	1	0	0	0	<b>2</b>

During the workshop two items were ranked as most important to increase BwN cases in the future: ‘Convince stakeholders with proof of BwN effectiveness’ and ‘Focus on additional benefits for stakeholders’. To gain support from stakeholders and decision-makers, evidence that BwN *works* is key. People need to believe that BwN is effective for the primary function as well as providing additional benefits, before people are willing to invest. BwN can best ‘sell’ itself when these (additional) benefits are proven in experiments and (pilot) projects. Another highly ranked outcome and discussed item was to make governments and municipalities responsible for flood protection measures. Which governmental institute is most important to involve, depends generally on the local situation where a BwN opportunity is considered.

## Conclusions

Opportunity maps are a powerful tool to identify areas with potential for BwN implementation in a structured way, and to communicate the results with policy-makers, decision-makers and practitioners. One needs to be aware of several trade-offs in the process of opportunity mapping, which are determined by the objective and target audience. The results from the questionnaire and workshop show that many enablers and barriers for BwN exist, and that the ranking of those factors can differ per location. That was especially true for finding funding sources (taxes or NGO/private funding) and what information is most important for mapping BwN opportunity. Nevertheless, it can also be concluded that the need for flood protection is in general more important than the additional benefits, because it makes implementation of a measure more likely. For convincing stakeholders, however, the additional benefits and proof thereof is considered very important. Of these additional benefits, healthy ecosystem functioning is more important than recreation, because the first is a prerequisite for the latter. Overall, these lessons from the Interreg BwN laboratories can inform the indicators of BwN opportunity mapping, especially when used together with the Interreg BwN 'Opportunity map'.