

Factsheet Business Case Pilot Kleirijperij

About Pilot Kleirijperij

The aim of the Pilot Kleirijperij is to gain knowledge on re-using dredged sludge for building materials. In the project, innovative methods are applied to convert sludge into clay in a cost-effective way, so that a business case can be developed for re-use of sludge extracted from the Eems-Dollard (in the north of the Netherlands). One of the applications of the new building materials is dike reinforcement.

Business case approach

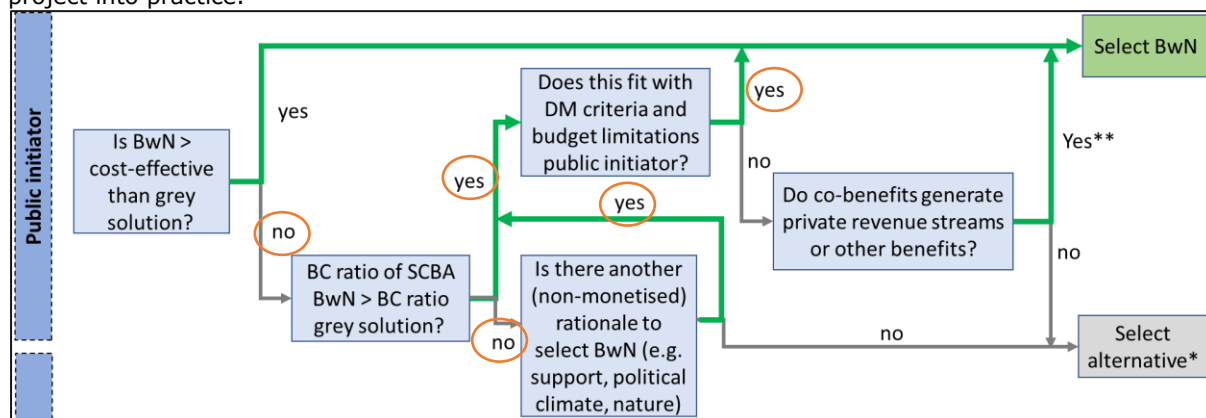
What type of business case was used to compare BwN to alternative solutions, and what role did it play in realizing funding for the project?

A multi-criteria cost-benefit analysis¹ was used for the project pilot Kleirijperij. The costs and predicted incomes were quantified of different alternatives to handle dredged sediments. The multi-criteria cost-benefit analysis showed a clear potential for the Kleirijperij to be able to process a large portion of the target fine sediment removal from the Eems—Dollard for a potentially competitive price. This justified the funding for initiating the pilot.

The pilot will need to confirm the technical feasibility and a favorable economic analysis, after which the market should be able to pick up the technology independently. For that, a business case document of the clay ripening *concept* (for upscaling) is being developed one of the (end) products of the project. This business case document will provide insight under which conditions upscaling the clay ripening concept is economically viable in comprising with other more conversional methods of providing clay.

Reason for investors to select BwN approach

The main reason to choose a BwN approach was to examine whether dyke reinforcement can be done with sediment from a local source, because this may be cheaper and more sustainable than methods such as asphalt covering on the dyke or using dyke clay from a river. There is also a sludge problem present in the Eems-Dollard estuary, which requires frequent dredging leaving sludge as a waste product. Connecting these interests creates a win-win situation. Subsequently, funding was sought to put the ideas of the project into practice.



Coping with uncertainty in the business case

As the Kleirijperij is a pilot project with knowledge development as main objective, uncertainties were inherent to the project plan but were no issue for the business case or financing.

Regarding the clay ripening, EcoShape is the owner and responsible for the (unexpected) dynamics that occur during the ripening process. EcoShape is contractually responsible for turning dredged sediments into clay, to be used for dike reinforcement. It is, however, understood by all partners that this is a pilot and natural dynamics may cause results different than anticipated upon. This risk is mitigated with room in the schedule and budget for extra monitoring and reworking. Further, all partners are kept updated with the results of the pilot, so to adapt the strategy as necessary. This risk is mitigated with adaptive management and room in the schedule and budget for extra monitoring. Further, all partners are kept

¹ Multi-criteria cost-benefit analysis is an adapted societal cost-benefit analysis, with elements of a multi-criteria analysis. This method uses multi-criteria indices to value non-monetary effects (Sijtsma et al. 2013).

updated with the results of the pilot, so to adapt the strategy as necessary. This can be done, for example, by discussing how the clay can be used elsewhere or by changing project schedule.

One way to deal with uncertainties is by understanding each other's interests in advance, but mainly by identifying the risks in time and transferring them to the stakeholder who can best manage them. A risk budget reservation is essential, especially if the pilot, like this one, has a high uncertainty in the outcome of the project.

As the project proceeds, the partners (especially de Water Authority) are allowed to look at different alternatives (e.g. accepting different clay parameters, longer ripening, extra reworking, parallel research to investigate influence on parameters different than originally expected) should the pilot not deliver the desired clay due to natural dynamics.

Barriers in BC approach

Pilot Kleirijperij is a knowledge development project. If the transformation from sludge into clay is profitable, the ecological and social values should also be quantified into the business case.

Opportunities in BC approach

Opportunities in the business case Kleirijperij are that the right arguments to substantiate the business case were provided. Also, the private-public partnership seems to work well. The private and public actors share the risk, but when the risk funds must be used the public risk fund will be spent first.

Finance

Who funded the project and how was the financing arranged?

Funders for the Pilot Kleirijperij are: Water Authority Hunze en Aa's, Waddenfonds², Province Groningen, Groningen Seaports, Rijkswaterstaat, Stichting EcoShape and Ministry of Economic affairs and climate policy (EA). The idea for the Pilot Kleirijperij came from EcoShape and Water Authority Hunze en Aa's. The idea of the project was linked to the Eems-Dollard 2050 Program. The Eems-Dollard 2050 Program was willing to fund the Pilot Kleirijperij and together they applied for the Waddenfonds subsidy.

Funder	Source of finance	% of initial investment costs	Motivation	Type of finance	Conditions of finance
<i>Waterschap Hunze en Aa's</i>	<i>Hoogwaterbeschermings-programma (HWBP)</i>	<i>14%</i>	<i>Coastal safety</i>	<i>Public - Domestic government</i>	<i>Grant, with condition that project goals are achieved</i>
<i>Waddenfonds</i>	<i>Waddenfonds subsidie</i>	<i>59%</i>	<i>Nature Development</i>	<i>Public - Domestic government</i>	<i>Grant, with condition that project goals are achieved</i>
<i>Rijkswaterstaat</i>		<i>8%</i>	<i>Nature Development</i>	<i>Public - Domestic government</i>	<i>Geen</i>
<i>EcoShape</i>	<i>Work performed on basis van IKP- rates</i>	<i>8%</i>	<i>Knowledge gain</i>		
<i>Province of Groningen</i>		<i>7%</i>	<i>Nature Development</i>		
<i>Groningen Seaport</i>		<i>2%</i>			
<i>Ministry of EA</i>		<i>2%</i>			

² The Waddenfonds is a joint scheme of the Wadden provinces of Frysland, Groningen and North-Holland. The fund invests in initiatives and projects that strengthen the ecology and sustainable economic development of the Wadden area.

What are the motives to invest in BwN?

The Waddenfonds was established to give a sustainable and qualitative boost to the ecology and economy of the Wadden region. In the context of the Eems-Dollard 2050 program, the ecological and (potential) economic benefits were interesting to subsidize. The top 5 for motivation to invest in this project:

1. Ecological / social (sustainability) gains;
2. Stimulus to local economy;
3. Knowledge (technical + socioeconomics) gains;
4. Political and stakeholder (project partners) support;
5. Innovative approach and potential for export to other locations / countries.

Barriers in financing BwN

During the process of finding funding for the Pilot Kleirijperij also the LIFE European grant was thought off. However, that deadline could not be met. Eventually, this might have turned out for the best because getting the LIFE European grant could have conflicted with getting the Waddenfonds grant.

Enablers in financing BwN

Opportunities in the business case Kleirijperij are that all partners understood that this is a pilot and natural dynamics may cause results different than anticipated upon, and are willing to do some adaptive management.

Procurement, how is it arranged and does it affect the BwN approach?

There was a cooperation arrangement between the province of Groningen, Rijkswaterstaat, Groninger Landschap, waterschappen and Groningen Seaport, which are all together in the Eems-Dollard 2050 agreement. Ecoshape joint them for the Kleirijperij project. Ecoshape would execute the Pilot Kleirijperij and at first, the idea was that the province of Groningen would grant the execution to Ecoshape. However, there were some legal restrictions. Eventually, Rijkswaterstaat could grant Ecoshape the execution, since Rijkswaterstaat and Ecoshape have a covenant about knowledge development.

In the contract, there was the obligation to deliver a certain amount of clay through the Kleirijperij or – if that is not possible- by buying clay was included in the contract (SOK). This was a necessary condition for the Water Authority and the flood protection program (HWBP) to step in as project partner.