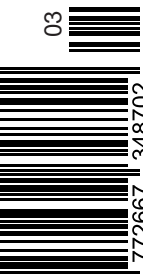


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Issue #03 Delta Challenges under Nature-Based Solutions Perspectives

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*Closing the
Implementation Gap
of Nature-based
Solutions*

*The case of Water as
Leverage - Cascading
Semarang*

Begoña Jaimerena

Nature-based Solutions (NbS) can help cities to become more resilient and climate adaptive. But more often than not, their implementation is reduced to awareness-raising pilot projects with limited chances of upscaling. The strategic plans that integrate these solutions, are hardly translated into investment plans, creating an implementation gap for NbS.

The Water as Leverage – Cascading Semarang project, addressed this gap as part of the development of an innovative, sustainable, bankable and implementable design proposal that considers an inclusive approach. It started with a shared narrative that defined a theory of change, through the development of the full investment case and implementation strategies.

The lessons learnt from that project, showed the urban planners and designers are in a unique position to drive the process of closing the implementation gap. Their comprehensive understanding of the urban dynamics, paired with the skills to lead the development of an innovative vision and shared narrative, can trigger the transformative changes that are needed to face current and future urban challenges. Furthermore, a collaborative approach enables ownership and allows the integration of relevant knowledge throughout the process, including environment, finance, and society.

Cities around the world face increasing challenges that threaten their resilience, as several climate-related, social, economic and environmental issues interact¹. These complex challenges require multifunctional and sometimes complex solutions that are capable of addressing them in a sustainable and inclusive way. Nature-based Solutions (NbS) are commonly envisioned as a way forward in the pursue of more resilient urban development. Thanks to their co-benefits, they are encouraged as a way to create more liveable, sustainable and inclusive cities, addressing different societal challenges.

The implementation of NbS requires partnerships and collaboration across sectors. This is needed to involve the different expertise needed, but also to unlock the access to funding and financing. Often, NbS projects are publicly funded, but this limits their implementation at scale. There is also the private sector, but a problem arises because existing investment systems and procurement processes are not meant for this type of solution. NbS are capable of addressing several challenges at a time, while also providing co-benefits to the environment and communities. But NbS can change over time, and those changes can in turn influence their performance. So, while the proponents of NbS might refer to the multifunctionality and co-benefits of these solutions, the project implementers and financiers think of assets and are interested in the risks that NbS entail.

There is an evident gap between the NbS plans and how they can be implemented, or more precisely between strategic plans and investment plans (i.e. funding and financing for implementation). To bridge that gap, it is necessary to develop a suitable project preparation, to ensure the sustainability in service delivery in the long term.

CLOSING THE IMPLEMENTATION GAP

Nature-based Solutions (NbS) are a fundamental part of new approaches that enhance urban resilience, enable the mitigation of water risks and a win-win between economy and environment². Unfortunately, the implementation of NbS at scale remains limited. Often, NbS are implemented as awareness-raising pilot projects following parallel processes from mainstream procurement practices. In addition, water security strategies and plans present a more integrated and comprehensive approach and can include a suitable combination of measures, including NbS, but are not easily implementable. There is a gap in the translation of the NbS pilots and water security strategies and plans, into a clear phased investment plan. This includes the funding and financing necessary for implementation and is needed to convince potential project sponsors and ensure buy-in. The gap between strategic planning and investment planning is known as the implementation gap.

There is a lot of expertise developing strategic plans for water security that is fundamental when planning for NbS for this purpose, with good synergies between NbS and grey infrastructure (e.g. hybrid infrastructure). However, the access to funds for their implementation is limited. Most investments in NbS are currently carried out by the public sector. This can be a constrain, especially when public funding is scarce, and uncertainties related to NbS performance over time are high. But the implementation of NbS at scale does not have to rely solely on public funds. It can also make use of private funds, or a combination of both, to prepare a full business case (Figure 1).

For that, it is important to have a project sponsor and project developer who are willing to take the risk of implementing NbS, in order to unlock the access to financing and translate plans into investable propositions.

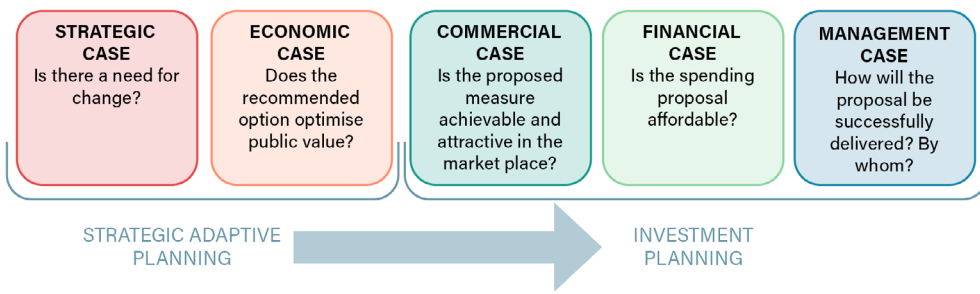
Closing the implementation gap is challenging. Existing project delivery and finance arrangements are often thought from a grey infrastructure perspective. There, grey infrastructure is seen as an asset with a clear function. But NbS are multifunctional, and can provide several co-benefits, which can be very appealing for users. However, to make that contractually feasible can be too complex and for project developers it might be easier to focus on grey infrastructure instead, minimizing the risks. There is also a challenging perception about some of the aspects related to NbS, which sometimes prevent us from implementing them. Some of them are:

- Future - proof investments: how future-proof are NbS
- Create demand for investments in NbS and governance structures for collective investments: how to ensure that money is invested in NbS
- Create markets for implementing NbS

The bridge needed to close the implementation gap between strategic and investment planning is a suitable project preparation process that shows a clear pathway to move from one to the other. At the core of it, is the development of investable NbS propositions that allow the upscaling of NbS and contribute to change our development paradigm. It also requires the alignment of language and interests between NbS proponents and project financiers². There is a range of NbS proponents, from communities that propose small scale interventions in their neighbourhoods, to local governments that plan city- or region-wide NbS projects.

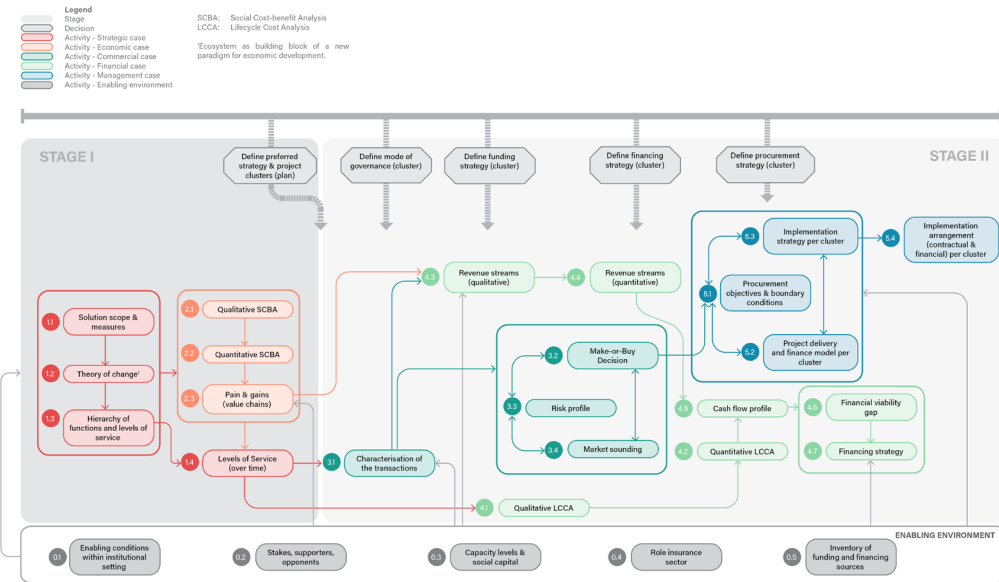
The project preparation process includes the creation of phased NbS or hybrid infrastructure, grouped in clusters if necessary, that can be absorbed by formal public investment planning processes. A suitable implementation and financing arrangement needs to be developed for each measure or cluster of measures. To do so, NbS needs to be understood and designed in terms of the function it has, the services it provides, and the actors that are willing to pay for it.

The achievement of the full business case depends on the development of the strategic, economic, financial, commercial and management cases. First it is necessary to zoom out and place the NbS or hybrid project into a larger economic development context, to strengthen the strategic and economic cases. This increases the chances of accessing multiple funding sources from different sectors. The strategic case for NbS, includes the theory of change, showing how they can trigger a paradigm shift and helping to position these solutions in many political agendas. This is where urban planners and designers can have an important role, contributing to set a robust strategic case with a visionary shared narrative and a suitable set of measures. Then, the economic case focuses on optimising the value, while conducting social cost-benefit analysis. Afterwards, by zooming in on specific NbS or hybrid projects, or cluster of projects, it is possible to develop the commercial, financial and management cases (Figure 2). This includes the definition of a governance structure, allocation of risks and responsibilities, alignment of incentives and the design of a fit for purpose implementation arrangement. There are multiple options there, ranging from 100% public to 100% private implementation. Supporting all the cases, is the enabling environment, which includes institutions, stakeholders, the community and others who make possible the implementation of successful NbS at scale.



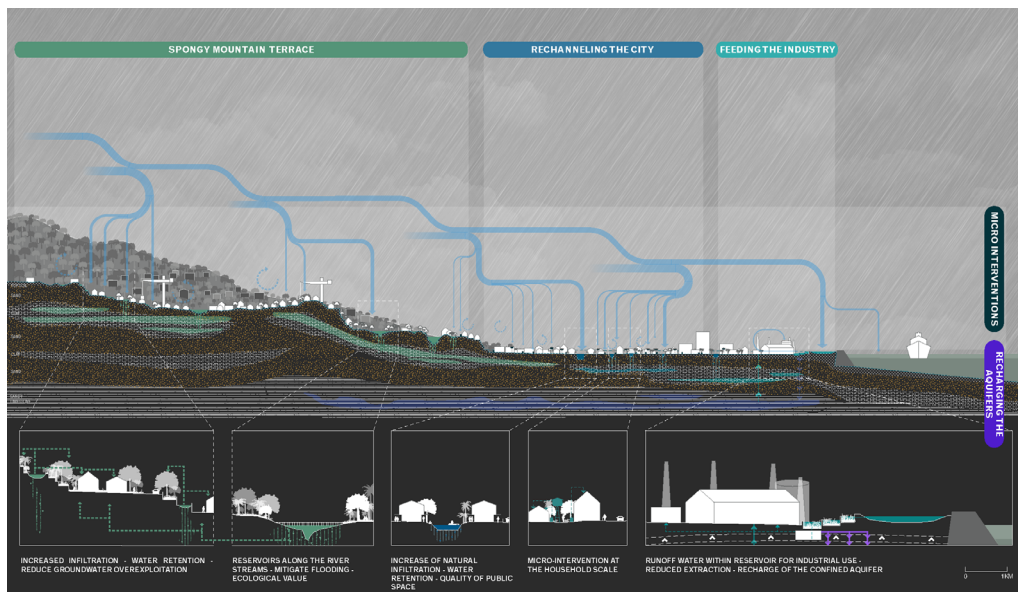
01 Overview of the full business case².

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02 Roadmap to develop the five business cases².

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03 Cascading Semarang implementation strategies.
 © Cascading Semarang team

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THE CASE: WATER AS LEVERAGE - CASCADING SEMARANG

Water as Leverage is a programme promoted by the Netherlands Enterprise Agency (RVO), on behalf of the Ministry of Foreign Affairs, and in collaboration with other international organizations. Its aim is to tackle urban water-related challenges in an inclusive way, by developing innovative, bankable and implementable design proposals that serve as catalysts for a transformative change. These proposals would contribute to leverage water for urban climate resilience.

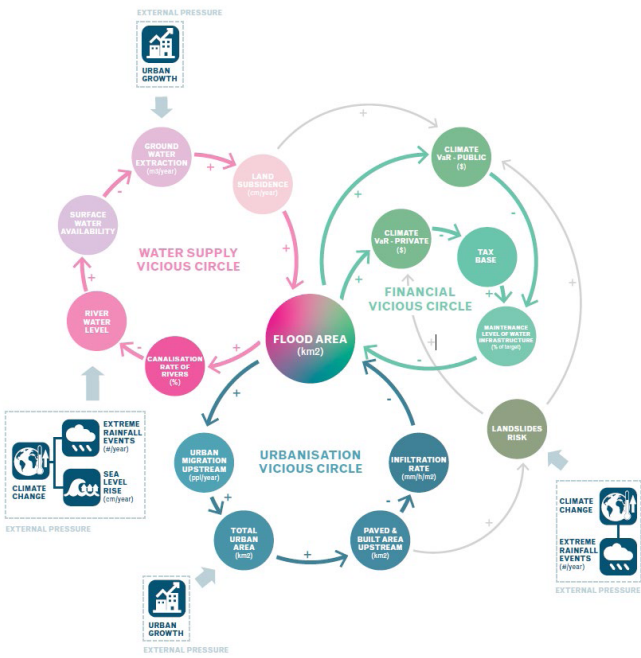
In its first version, this programme focused on resilient cities in Asia, with Semarang being one of the chosen cities. Semarang is one of the biggest cities in Indonesia. It is urbanizing rapidly, and it is regularly affected by flooding partly due to how the water is managed, with the over extraction of groundwater. The current water management strategy in Semarang relies on drainage into the sea, but a new strategy is proposed to enable a more efficient and sustainable use of resources.

In this project, the approach was to look at water not only in terms of risks and constrains, but rather to understand the opportunities it presents, and how it can become a motor for sustainable economic development. This means looking at challenges from the perspective of multiple sectors from the beginning and use water to generate value and make the benefits of it visible. The project proposed five implementation strategies based on the different urban typologies: spongy mountain terrace, rechannelling the city, feeding the industry, recharging the aquifer and micro-interventions. Through the typologies, the idea was to set in motion a win-win effect between climate, water and economic development goals.

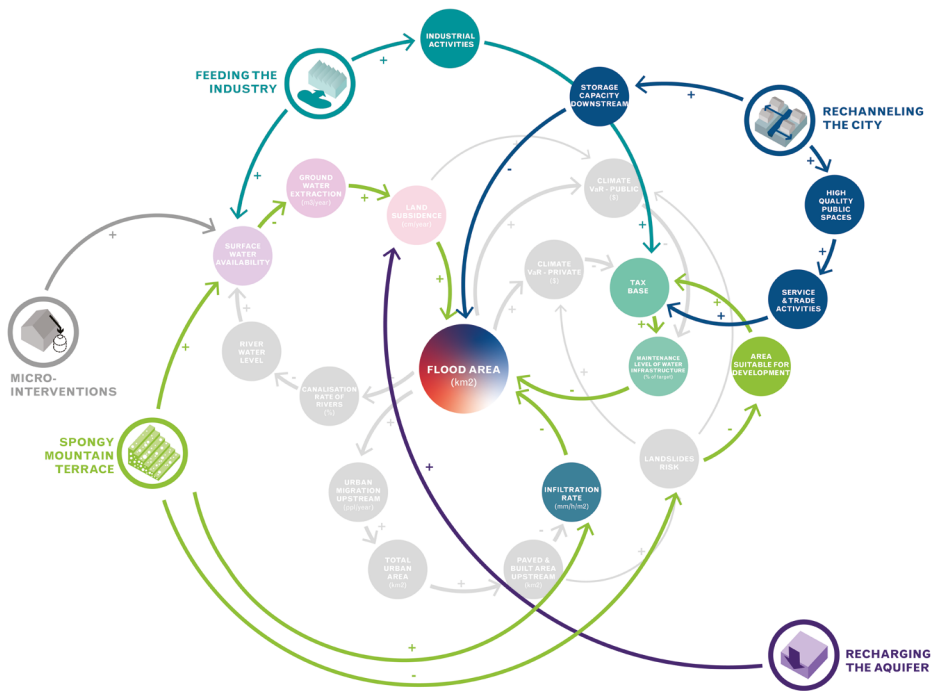
As part of the project, there was also the aim to develop an enabling environment for private sector participation while developing a fit for purpose arrangement that works within the current environment (i.e. regulation and legal environment), all with the intention of reducing the transaction cost of upscaling and replicating the implementation strategies but also looking to increase the competitiveness of the private sector in Semarang, including small and medium enterprises.

The implementation strategies proposed included a combination of NbS with grey solutions (hybrid solutions) to deliver the expected levels of service. For example, the strategies spongy mountain terrace focused on capturing rainwater upstream, to reduce runoff and contribute to reduce flood risks downstream. It includes measures such as resilient residential developments with improved foundations and green areas, reservoirs, purification ponds and other related water infrastructure, sustainable urban drainage systems like bioswales, and nature conservation areas.

The methodology was based on a design that integrates the development of the full investment case for NbS. First, are the strategic and economic cases. NbS needs to be placed in a bigger economic narrative, looking at the strategic fit of NbS and hybrid strategies for the wider economic context. This defines the theory of change, explaining how the investment in NbS as part of the programme can drive a paradigm shift. Then, the current dynamics were mapped to better understand how water is managed, especially groundwater and its relation to land subsidence. At this point, vicious cycles (Figure 4) regarding water supply, finance and urbanization were identified, and so are potential ways to change them into virtuous cycles by using NbS and hybrid strategies in a new theory of change (Figure 5).



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As part of the strategic case, several measures were defined, and then grouped in clusters of projects that comprised structural measures (both NbS and grey) and non-structural measures (e.g. awareness, monitoring). The development of the economic case focus on assessing the value for money of the measures, by performing cost-benefits analysis. Those focused on the expected effects on the environment, society, economy and institutions, as well as the effects on three economic agents: individuals, producers, and government.

Later, as part of the commercial, and financial case, the cash profile of the projects was defined, as well as the level of service that can be guaranteed over time, and the risk. This is the risk that NbS are contributing to reduce, but also the risks that they face during the entire life cycle that can threaten the functionality of the project. It is important to define a hierarchy of functions, ideally between 2 and 4 linked to one specific service. This way the arrangement of the contract that allows the payments by different target groups becomes feasible. This also sets the base to the potential use of blended finances.

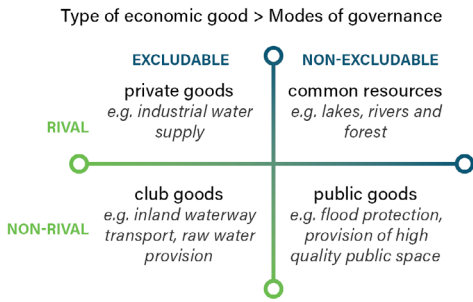
NbS can also be developed as part of mosaic projects. These are projects that serve multiple markets depending on where the demand is. This allows for the stacking of the funding from multiple benefits like carbon offsets, water quality credits, etc.

Finally, as part of the management case, the implementation arrangement is finalized, considering the measures defined, as well as the services they provide. It starts with the definition of the mode of governance, understanding services as a type of economic good, then the funding strategy, and financing strategy. Afterwards, it is time to define the procurement strategy (Figure 6), identifying who is going to be involved in which phase of the project implementation, and if NbS are going to be packaged or not.

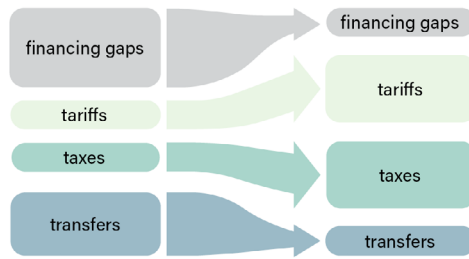
The families of implementation arrangements for NbS for water security are: (i) public project procurement, (ii) privately driven water stewardship, (iii) collective investment schemes/investment funds and (iv) environmental markets. Public procurement refers to when the public commissioner contracts water services from private suppliers. Privately driven water stewardship refers to when a private commissioner contracts NbS projects for Corporate Social Responsibility (CSR) or to introduce efficiencies in their value chain. Collective investment schemes and investment funds refers to the assets owned by the fund, called a portfolio and managed by a fund manager. Environmental markets refer to an ecosystem service itself that is marketed and sold as a commodity to a beneficiary in the context of a dedicated market, usually subject to oversight by a regulatory body.

A cost-benefit analysis looked at the mains services provided, the co-benefits identified, the costs of the implementation, both at one location and at scale over a longer period for the complete strategy. Based on that, a blended finance strategy (public-private) was developed for each strategy, together with an implementation arrangement.

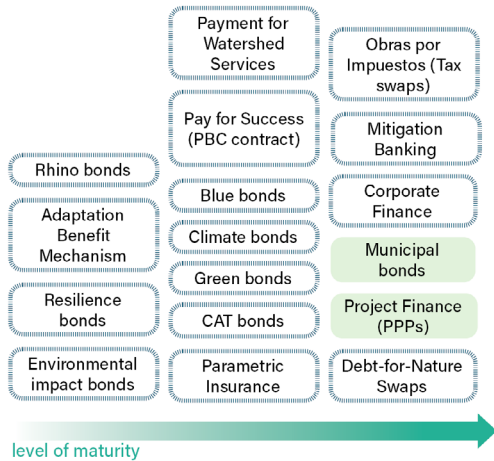
DEFINE A MODE OF GOVERNANCE PER CLUSTER



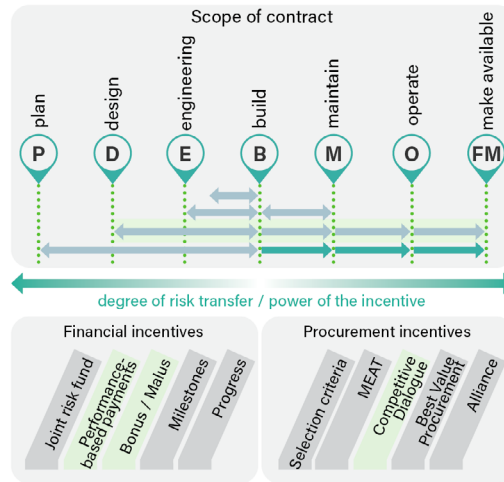
DEFINE A FUNDING STRATEGY PER CLUSTER



DEFINE A FINANCING STRATEGY PER CLUSTER



DEFINE A PROCUREMENT STRATEGY PER CLUSTER



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CONCLUSIONS

Urban planners and designers, as NbS proponents, can be in a unique position to address the NbS implementation gap. They have a comprehensive understanding of the urban dynamics and can lead the creation of a theory of change and a shared narrative to kick-start the development of the strategic case. This is the first step in a larger collaborative project preparation process. By aligning interests in this shared narrative, as well as the language used, ownership of the process and its result by stakeholders is developed from the start.

To access funding and financing for NbS, is necessary to develop the full investment case for each of the NbS projects or cluster of projects. But often, NbS proponents are organisations with limited involvement in public and private investment planning processes. This results in awareness raising NbS pilot projects that are hard to upscale, instead of investment projects. When shaping NbS as investable propositions, they could attract funds from either public or private organizations, maximizing the chances of successful implementation.

Different actors in the NbS implementation process have different interests, mandates and language. The latter refers to more than just the concepts used and what they mean, and it can easily hinder communication if left unchecked. For example, NbS proponents might have a concept design, but project developers need to understand the assets that are part of it, and financiers might be more concern about the risks associated with it.

Understanding NbS in terms of functions, services provided and cost, and linking that to beneficiaries and actors potentially willing to pay for those services, allows a clearer organization and prioritization of mea-

tures, and their phasing over time. Not only that, but there is the need to clarify and agree on a hierarchy of functions and associated levels of services that enable acceptable trade-offs during the complete life cycle of NbS: design, implementation, maintenance and monitoring.

Moreover, the level of service of NbS can change over time, which represents a risk for financiers. It is important to map the life cycle of NbS and the expected level of service over time, as well as the expertise needed, to identify who should be involved in which part of process. By doing so, projects can be phased in a way that the project is delivered at a low cost, with high quality and minimum risks. This also involves the

There is an evident difference between traditional grey infrastructure projects and NbS ones. This calls for the reconsideration of traditional procurement processes, and even public investments. Moreover, NbS proponents need to improve their project preparation skills to be able to bridge the communication gap with project developers and financiers. This would result in NbS projects that are shaped differently so they can make the investment case, whether that is with public or private resources, or a combination of both.

[About public-private-science collaboration in NbS investments] “This revolution in understanding could then inform a new generation of planning, project origination, project preparation and procurement tools and models that guide the selection of the most transformative and effective infrastructure investments.”³

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