Paving the way for scaling up investment in nature-based solutions along coasts and rivers

Executive Summary

EcoShape

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Building with Nature has the potential to preserve the rapidly degrading natural ecosystems while answering the need for coastal hydrologic infrastructure such as ports and flood defence, even better, they come with lower investment costs. Despite these advantages application of Building with Nature is presently still exception rather than rule because public funding is lacking, and because there is little knowledge on effectiveness and costs and there is no project revenue.

Unlocking the value of Building with Nature can be achieved by a variety of measures:

- Short-term: apply a value-based approach in planning investments and mainstream this approach in procurement and contracting
- Medium-term: develop a knowledge base, mobilise private finance and develop public private partnerships
- Long-term: establish natural capital markets and earmark blended funds

1. The Value of Building with Nature

Current global public coastal protection investment levels fall below the estimated need of $103 bln to $215 bln per year between 2015 and 2100. This range depends on climate and socio-economic scenarios and includes construction of new infrastructure and maintenance of existing infrastructure. Particularly low-income economies are unable to invest significantly in flood protection due to financial constraints and the need to invest in other priority areas. If these investment needs are not met, global flood losses in the 136 largest coastal cities alone are expected to rise from US$ 6 billion per year in 2005 to US$ 1 trillion in 2050 as a result of population and economic growth, climate change and subsidence.

At the same time the world's natural ecosystems are degrading at an unprecedented speed, and the rate of degradation is accelerating. The recent United Nations IPBES report (2019), a global assessment report on biodiversity and ecosystem services found that around 1 million animal and plant species are now threatened with extinction, many within decades, more than ever before in human history. Major culprits are changes in land and sea use and climate change. Despite progress to conserve nature and implement policies, the report finds that global goals cannot be met with current policies.

The value of goods and services provided by the world's natural capital amount to USD 125 trillion per year, buts this value gradually falls as a result of the degradation of natural capital by land use changes. In order to conserve the entire natural ecosystem of the planet US$ 355-385 billion per year would be required, while currently spending only amounted to US$ 52 billion per year. These amounts seem staggeringly high. However, they are modest compared to global infrastructure spending (US$ 3 trillion per year) and very small compared to the annual value of ecosystem services.

Building with Nature solutions along coasts and rivers offer emerging countries a recipe to harmoniously blend, population and economic growth and infrastructure development with climate adaptation and nature preservation. Against the background of limited financial possibilities these solutions potentially offer a more attractive and feasible option for infrastructure such as port development and flood protection in comparison with the conventional 'hard and grey' infrastructure.

Strengthened Ecosystems

Hydraulic infrastructure development through Building with Nature implies preservation and strengthening of the natural environment, which results in co-benefits for biodiversity and society, for example in the field of fishery and recreation, CO_2 storage and landscape quality. Conventional solutions in port development and flood protection in response to climate change on the other hand tend to impair the functioning of ecosystems.

Lower Investments Costs

Depending on local circumstances and desired flood risk protection levels Building with Nature solutions have the potential to achieve the same reduction benefits as conventional infrastructure at a lower lifecycle cost. Furthermore, these solutions have lower sunk costs and are much more adaptive. These characteristics are very valuable given the unpredictability of climate change, and contribute to a more efficient use of financial means.

Despite these advantages application of Building with Nature is presently still exception rather than rule. The number of BwN projects actually implemented around the globe remain limited, with the majority of infrastructure investment still targeted towards conventional solutions (WBCSD, 2017). If there is a potential to preserve nature against the background of substantial infrastructure needs in emerging countries, why do we not reap the benefits of Building with Nature and how can we change this for the better?

Building with Nature
Building with Nature aims to embed natural processes in engineering solutions. It is a knowledge base for an approach to delivering Nature-based Solutions. Building with Nature meets society's infrastructural demands by starting from the functioning of the natural and societal systems in which infrastructure is to be realised.

2. Prevailing barriers towards Building with Nature

Low Public Investments
Most low- and medium-income countries cope with a substantial investment gap between infrastructure needs and public funds. The available budget is often geared towards sectors that directly contribute to the growth of the gross national product, such as health, transport and energy. Donor funding tends to follow national budget planning. Appraisal of investments focuses on the capital expenditure together with economic and social benefits, often disregarding total costs of ownership and positive externalities that are beyond the scope of the project sponsor.

Little Knowledge and Certainty on Effectiveness and Costs
Compared to conventional infrastructure the knowledge on the effectiveness and the related long-term costs of Building with Nature is still limited. As there are insufficient projects to build a solid evidence base, lessons learned are often location-specific, and permanent and consistent monitoring is often lacking. This reinforces the inclination of decision-makers to implement the more familiar and proven conventional infrastructure solutions.

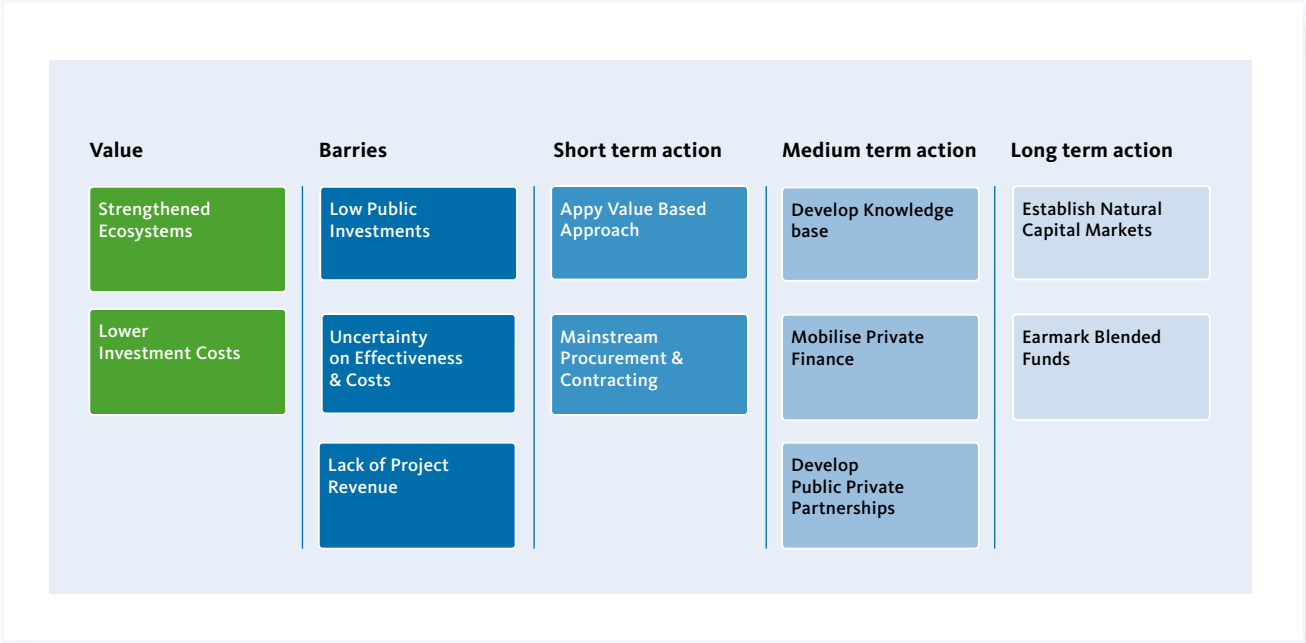
Lack of Project Revenue
If public funds for coastal infrastructure are falling short, can private finance then form a solution here? Flood protection assets are built to safeguard us from a risk of which it is unsure if and when it occurs. It may result in future savings because loss and damage is prevented. The asset in itself however lacks earning power resulting in a revenue, required for a feasible business case. Because of this, there is little to no appetite among the private sector to step into these projects and provide finance. Hence the value of private sector participation - entrepreneurship, innovation, operational efficiencies, risk sharing and budgeting - remains unlocked. And even if there was a positive cash flow, because of the public function, ownership of hydraulic infrastructure often is with governments. And these public owners have little drive and experience in tailoring the project conditions – scope and risk profile - towards private investors and financers. This gives private sector initiative little space.

3. Unlocking the Value of Building with Nature

Coastal ecosystems are among the most valuable ecosystems on the planet. In most cases, the economic value of preserving or restoring such ecosystems significantly exceeds investment costs. Because of these ecosystem benefits coastal protection using Building with Nature solutions can achieve a high economic return on investment. To catalyse these investments, coherent action is required from multiple stakeholders.

Short term

Apply Value-based Approach
In planning and assessing coastal infrastructure investments positive externalities should be considered and focussed at by governments, planners and developers, in addition to the primary benefits. Project alternatives should be thoroughly analysed through standardised (compulsory) cost-benefit analysis (CBA) together with a life-cycle approach, including the long term benefits of ecosystem enhancement in terms of biodiversity and services. Reliable and easy to use methodologies to quantify and monetize these benefits are eminent. All beneficiaries of the project should be invited to help and structure the project and take up their fair part of the bill. At the same time, getting a realistic idea of the total costs of the traditional 'hard and grey' solutions, including the impact on the environment, puts the Building with Nature solution higher on the agenda.



Mainstream in Procurement and Contracting

In procuring and contracting hydraulic infrastructure such as ports and flood protection governments and development banks should take into account the benefits of the use of Building with Nature that come with more positive and less negative impact on nature. This can be done through defining functional specifications, on ecosystem enhancement for example, instead of technical specifications. This challenges the market to come up with solutions that maximise co-benefits for the local natural capital. In awarding contracts life-cycle costs and quality elements beyond the primary function of the asset should play a prominent role. Donors may promote the use of Building with Nature solutions by funding the project development costs, financing possible extra capital costs, and offering result-based-finance or specific loan and subsidy conditions.

Medium term

Develop Knowledge Base

Building with Nature solutions are often innovative, dynamic and geared towards a specific location. For government and developers to opt for this alternative, a knowledge base on design, performance and impact needs to be established to understand which interventions are effective under which circumstances against which cost. Reliable historic data on asset performance through permanent monitoring should be developed. For project sponsors a realistic understanding and assessment of the risks and costs constitute the basis for adequate investment decisions. For financiers

> *Building with Nature that come with more positive and less negative impact on nature.*

unpredictable outcomes of the Building with Nature function forms a serious hurdle for financing. Multilateral institutes and knowledge institutes with local experience should initiate and fund the establishment of an easy to access global knowledge base and information network.

Mobilise Private Finance

With the aim of attracting private sector finance development banks, climate funds and governments should take a strategic role in financing Building with Nature solutions. Now potential project initiators, investors, financers and insurers tend to shy away from the innovative character of projects, (perceived) risks and relatively small ticket sizes. Participation of knowledgeable impact investors is key, to provide subsidies, (first loss) guarantees, concessional finance and viability gap funding lowering the risk of private financers (de-risking). The coud result in more appetite among commercial financers and institutional investors to step in.

Through issuing blue bonds governments, development banks or project sponsors can mobilise private finance supporting publicly funding hydraulic infrastructure projects. This may relief short-term budget constraints of governments and accelerate investments. The bonds may be used to finance Building with Nature programmes or projects and make them financially viable. Important requirement then is that the use of bond finance results in an actual transfer of risks reflected in the revenue / risk ratio. These bonds should attract therefore impact investors who accept a lower return resulting in projects becoming more feasible.

Develop Public Private Partnerships

Through public private partnerships, private initiative, innovation and finance can be unlocked for the development of coastal nature-based infrastructure assets. Conditional transfer of economic ownership under certain conditions for a period of time to the private sector, means that the public function still can be safeguarded. It is a project delivery model in which private finance can be attracted, even without (sufficient) project revenue stream. The partnership enables governments to develop projects without having the public budget available now. It is the private sector financing the project, entirely or partly. Naturally the economic, social and environmental benefits should justify the investment.

During the lifetime of the partnership the private investor will be paid back through an annual availability payment from the government. This payment may depend on specific performance indicators set by the principal such as flood safety levels or ecosystem enhancement. Hence the private sector gets the opportunity to come up with life-cycle optimizations through Building with Nature. One should be realistic on what the private sector can bring, exceptional risks may be shared between the public and private party. It is up to the national, regional or local governments to open up for public private partnerships in coastal infrastructure projects. Having the right experience with these deals in developing countries, multilateral institutions and banks can support in project preparation, procurement and contracting.

Long term

Establish Natural Capital Markets

Multilateral development institutions and banks should join forces together with governments of developing countries to establish natural capital markets – compulsory or voluntary – that capitalize on the positive externalities resulting from Building with Nature. Hence an alternative revenue stream is created that did not exist

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before. For example Carbon credit schemes, such as the Clean Development Mechanism, for example, can be used to convert carbon sequestration benefits into revenue-generating tradeable carbon credits. Sale of these credits provides additional financial means, for example for for example for restoration projects of salt marsh, mangrove or seagrass ecosystems. projects as salt marsh restoration, mangroves and seagrasses. Such schemes must be continued and extended to other types of ecosystem services and conservation goals such as biodiversity. Currently these carbon credits have a low value, leading to little revenue. The functioning and credibility of these schemes should be enhanced, unlocking more financial flows to make Building with Nature project feasible.

Earmark Blended Funds

Multilateral development banks, climate funds and governments, should establish funds that earmark financial resources for Building with Nature solutions exclusively to incite the right initiatives, innovations and investments, often in a role as co-financer. The main purpose of these funds is lowering the threshold for public sponsors and private financers to initiate and participate in Building with Nature solutions. This can be done by either mobilising funding for project development for the sponsor or in the form of equity and loans to alleviate the risk perceived by the private financer. The result should be better structured projects, public sponsors and (local) financers understanding scope and risk of the projects and a pipeline of investable Building with Nature solutions. Building with Nature solutions have multiple benefits in the form of a revenue stream or a costs saving. This comes with multiple beneficiaries that have a reason to contribute financially. The fund may be the place where all those beneficiaries pull their resources together for a common cause.

Traditional financing institutes prefer large and easy to process loans to reduce transaction costs. A focussed portfolio approach of a dedicated fund legitimates the Building with Nature investments, often requiring less capital compared to the conventional alternative.

Photography

Photo Cover and page 2 Boskalis, Timbul Sloko

Page 7 Joop van Houdt, Sand bars at the Sand Mot

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