

Nature Based Climate Solutions

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Context and rationale

Nature Based Solutions are inspired and supported by nature and have large potential for reducing carbon emissions and increasing resilience. Wageningen University & Research (WUR) has ample experience with nature based climate solutions. Our mission is to explore the potential of nature to improve the quality of life. We co-create and design nature based solutions together with businesses, governments and ngo's in order to create awareness and evidence base for the potential of NBS to reduce carbon emissions and to increase resilience to climate impact. Nature Based Solutions provide opportunities for climate and biodiversity.

WUR was involved in several national and international research programmes to create evidence base for the potential of NBS for coastal protection, river management, stream restoration, climate smart forestry, wetland restoration, peat soils, climate smart agriculture, green infrastructure for urban areas.

Large scale implementation of NBS will be critical to achieve the Paris Agreement and 2030 Agenda for Sustainable Development (World Water Forum Report, 2018). Although attention to NBS has significantly increased in recent years there is still a lack of awareness, evidence base and financial arrangement to further upscale NBS. For this reason we support the NBS coalition in order to put NBS on top of the international climate agenda.

An overview of the contribution

Building with Nature / Deltaplan Bangladesh

In co-operation with Royal HaskoningDHV and the Institute of Marine Sciences and Fisheries of the University of Chittagong, WUR contributed to the Deltaplan for Bangladesh, an interactive integrated plan for a futureproof and climate resilient Bangladesh. NBS was one of the underlying principles for the deltaplan. WUR was involved in a pilot project in Bangladesh to explore the potential of an oyster reef to protect the coast. Eco engineering can be used to protect the coast of Bangladesh. Every year, floods wash away the earthen dikes along the Bangladeshi coast. A barrier could be built in the sea to break the waves. Natural processes could be used to help build this barrier, researchers from Wageningen and other institutions have shown. Nature seems willing to help us keep the upper hand over the advancing waves and rising sea levels and providing us with new sources of food and income.

When a wall of concrete blocks is built just off the coast, oysters will start living on this wall and over time a semi-natural reef will be formed. Behind this reef, mangrove trees could be planted. This vegetation would break the waves before they reach the land. At the same time, the reef forms a natural habitat for

fish and crabs, which the local population could eat or sell to generate some extra income. This innovative form of coastal protection contributes to climate adaptation and sea level rise.

Building with Nature for Indonesia

An international consortium of coastal engineering firms (Boskalis and Van Oord), marine institutes (Witteveen+Bos, Deltares, EcoShape, Wageningen University & Research, UNESCO IHE, von Lieberman), and NGOs (Wetlands International, Blue Forests) together with the Indonesian government and Indonesian partners recently developed an innovative approach to mangrove restoration near the city of Semarang, northern Java island. With the initiative the partners aim to enhance coastal resilience for 70,000 vulnerability people in Central Java by avoiding further coastal flooding and erosion and by providing them with a long term perspective for sustainable economic development through revitalization of aquaculture ponds for crab and shrimp farming. We do this by integrating mangrove restoration, small scale engineering and sustainable land use.

While mangrove restoration and mitigation has become very popular worldwide as a method to restore coastal resilience and ecosystem functioning, high failure rates are typical. In many cases involving actual planting, the wrong species are planted in unsuitable areas. In fact, recent work has shown that given the right conditions, mangrove recovery actually works best without planting at all. Therefore, this initiative aims at restoring the right conditions for mangrove regeneration by placing semi-permeable barriers from poles and brushwood that dampen the waves and capture sediment.

How the contribution leverages living natural systems as a solution to avert climate change?

Building with Nature begins with the natural system and uses ecosystem services to meet society's need for infrastructure and encourages the development of nature at the same time. Building with nature rather than against it provides opportunities for carbon capture and increasing resilience. In many cases building with nature also provides opportunities for social and economic improvements.

Which countries and organisations are involved in the contribution?

Both in Indonesia and Bangladesh there was an international consortium of knowledge institutes, governments and NGOs (see text above).

How have stakeholders (for example indigenous peoples, local communities, and youth) been consulted in developing the contribution?

For these initiatives local stakeholders were intensively involved in the co-design and implementation process

Where the contribution can be put into action?

These initiatives are scalable in low lying (sub)tropical delta areas around the world

How the contribution will be delivered? How will different stakeholders be engaged in its implementation? What are the potential transformational impacts?

A training course for NBS could be developed. The potential impacts are manifold; coastal protection, increase in biodiversity and a better livelihood for local people. Living labs of nature based solutions in low lying delta areas could be created and a global community of practice could be set up in order to share best practices and upscale NBS.

Is this initiative contributing to other Climate Action Summit workstream (industry transition; energy transition; climate finance and carbon pricing; infrastructure, cities and local action; resilience and adaptation; youth and citizen mobilization; social and political drivers; mitigation strategy)?

Cities and local action, and resilience and adaptation

Examples of experiences to date: how does this contribution build upon this experience? How does the contribution link with different ongoing initiatives?

WUR is involved in several NBS initiatives, most of them in EU/Netherlands.

Mechanisms for funding (with specific emphasis on potential for partnerships)

Funding is a combined effort of public funds, NGOs, knowledge institutes and engineering firms.

Means of stewardship, metrics for monitoring

The initiatives are tested in practice and closely monitored with the help of local universities.

Communication strategy

A communication strategy is developed to promote the initiatives, and moreover, to publish all scientific results and lessons learned on the internet.

Contact details of proponents (indicating the degree of commitment among the countries and organizations that are named).

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Indonesia, see <https://www.ecoshape.org/en/projects/building-with-nature-indonesia/>

Bangladesh, see <https://www.wur.nl/nl/show/ECOBAS-Eco-engineered-coastal-defence-integrated-with-sustainable-aquatic-food-production.htm>