Evidence Brief – Nature-Based Solutions

THEMATIC SUPPORT UNIT

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Nature-based Solutions (NbS) are nothing new, but increasingly promoted by various actors and policy at all levels to address the interlinked crises of biodiversity loss and climate change. They can play a significant role in reducing poverty by helping combat environmental, social, and economic challenges if designed and applied in line with adequate standards.

NbS are defined by the United Nations Environment Assembly (UNEA) since 2022 as "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well- being, ecosystem services, resilience and biodiversity benefits."[1] The concept has evolved over a few decades.

There has been a growing policy uptake of NbS worldwide. About 50% of the targets of the Sustainable Development Goals (SDGs) of the 2030 Sustainable Development Agenda, are dependent on nature for their achievement.[2] NbS is a key feature of the Kunming-Montreal Global Biodiversity Framework (KM-GBF)[3] under the Convention on Biological Diversity and is a bridging element between the KM-GBF and the Paris Agreement.[4] The NbS concept is based on the knowledge that biodiversity loss and climate change have drivers in common and therefore also have shared solutions.[5] Other global policy instruments, such as the Sendai Framework for Disaster Risk Reduction 2015-2030[6], underscores the role of NbS. The critical funding need for NbS is estimated at USD 384 billion/year by 2025.[7]

Figure 1. The underlying ideas behind the NbS concept (Nature-based Solutions Initiative, 2021). Credit: Ata Tara.

KEY FEATURES OF NBS

The application of NbS should be based on clearly identified needs, i.e. the problem identification. Thereafter follows the assessment of a potential fit of NbS, the solution. It involves making decisions about how to best integrate NbS and other techniques and to maximise advantages while minimising trade-offs.[8] The essence of NbS can be summarised as[9]:

i. NbS involve working with different types of ecosystems (natural or modified);

ii. NbS use and work with nature in various ways, which can be broadly categorised as conservation, protection, restoration, management, and sustainable use;

iii. NbS are solution-oriented and can be used to address a range of social, economic, and environmental challenges;

iv. NbS are often explicitly targeted at more than one challenge, and are able to deliver benefits across a range of goals;

v. NbS are often combined with other solutions, such as grey infrastructure.[10]

1 UNEP/EA, 2022. [UNEP/EA.5/Res.5]
2 84 targets out of the total number of 169 targets. For 24 targets the relationship is ***obvious***, either the target's language relates to nature itself or explicitly references the sustainable use of nature. Hole et al., 2022
3 CBD, 2022
4 Seddon, 2022
5 IPBES-IPCC, 2021
6 UN, 2015
7 UNEP, 2022a
8 IUCN, 2022a (Criterion 6)
9 Text modified from UNEP, 2022b
10 Grey infrastructure is traditional engineered ("grey") solutions that provide one or multiple services required by society such as transportation or wastewater treatment.

WHAT IS NOT NBS

Innovative interventions that resolve societal and ecological problems cannot be referred to as NbS simply because they are inspired by nature. Examples are actions that use solar, wind or wave energy, or contain materials based on biological processes but are not directly grounded on functioning ecosystems.[11] Other interventions that should not be categorised as NbS include purely grey interventions, actions that do not address all pillars of sustainability or do not apply a landscape lens. The same applies to interventions that cannot be implemented by local people or do not fit the local context, actions that lack local consultation and wide stakeholder involvement, and actions whose financial expenses are disproportionate to benefits.[12]

OPPORTUNITIES AND RISKS WITH NBS

NbS have the potential to support biodiversity, vital ecosystem services, access to fresh water, improved livelihoods, healthy diets and food security from sustainable food systems and a variety of other benefits across sectors which contribute to poverty reduction. At the same time, there are uncertainties about when, where, how, and for whom NbS are effective. Controversies surround the misuse of the term, violations of human rights, and threats to biodiversity.[13] Opportunities and risks of NbS are exemplified below.[14]

Opportunities

Biodiversity By protecting existing natural spaces and elements or through the establishment of new natural elements NbS support ecosystems and the provision of ecosystem services.

Climate change adaptation and mitigation Through protection, restoration, and management of natural and semi-natural ecosystems within river catchments, sustainable management of lands to sustain or enhance crop yields during unpredictable growing conditions, and creation of wetlands to reduce flood risk, NbS can have both adaptation and mitigation benefits.[15]

DRR and building resilience Ecosystem restoration and other adaptation measures reduce disaster risk and can, e.g. increase food and water supply, and improve overall. The stabilisation of slopes by vegetation cover can lower the likelihood of landslides. Mangroves, sand dunes, and coastal vegetation can shield areas from cyclones, winds, and storm surges.[16] [17]

Water security Protecting, restoring or constructing wetlands can support the provision of clean water for drinking water needs and other uses. NbS targeted at water security can also (and shall) provide co-benefits such as protecting infrastructure, supporting decent work and sequestering carbon, which should have a positive impact on biodiversity.[18] [19]

Food security By, e.g. providing hydrological services, maintaining groundcover, restoring rangeland sustainably managing soil biodiversity, water and nutrients through agricultural practices[20], NbS can support food production and, resilience, while enhancing ecosystem services.

Urban development In urban settings, including slums and informal settlements, NbS can address interconnected problems such as the lack of urban services, loss of biodiversity and increasing vulnerability to climate change.[21] NbS such as tree-covered areas along streets or parks can reduce the urban heat island effect, NbS can have multiple health benefits.[22] Wetlands can manage run-off water resulting in fewer flooding events.

Employment NbS have large benefits for the job market. About 1.2 billion jobs in industries, including agriculture, fisheries, forestry, and tourism, depend on healthy ecosystems.[23]

11 IUCN, 2020b
12 Sowińska-Świerkosz and García, 2022
13 Seddon, 2022
14 Text adapted from Geneva Environment Network, 2021 (NbS Dialogues), if no other reference is given.
15 Seddon, 2022
16 Sisay et al., 2023
17 UNDRR, 2021
18 UN Environment-DHI, UN Environment and IUCN, 2018
19 Cassin and Matthews, 2021
20 Agriculture encompassing crops, livestock, forestry, fisheries, and aquaculture.
21 UN-Habitat, 2023
22 Kabisch et al., 2022
23 ILO, 2018

Risks

NbS ambiguity The uncertainty of the concept and the misinterpretation by decision-makers and stakeholders, thus risking negative effects.[24]

Greenwashing The misuse of the NbS concept can harm biodiversity and negatively impact ecosystem functions and services and undermine resilient and adaptive ecosystems.[25]

Unclear poverty perspective and benefits for the most vulnerable groups If NbS are not designed correctly, women, people with disabilities, low-income households, and other marginalized groups may face barriers to accessing the benefits of NbS.

Human rights and engagement of Indigenous Peoples and local communities (IPLC) If not designed and managed well, NbS can risk the security of land tenure rights and access to natural resources of IPLC.

Leakage The role of nature-based offsets is expanding in market-led climate change solutions. To avoid the issue of leakage means that scaling up of NbS in one location should not result in ecosystem loss and damage to another site.[26]

Unclear attribution of NbS to results There is a lack of systematic monitoring and evaluation of NbS interventions.

For NbS in practice, cases and guidance, see the **Sida Technical Note: Nature-based Solutions – Optimising Benefits and Avoiding Risks,** October 2024.

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