

Nature-Based Solutions- What can they really achieve?

Sandra Naumann, Ecologic Institute (2 August 2022)





UNEA resolution (2022)

“Nature-based solutions are 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 and resilience and biodiversity benefits.”

Nature-based solutions (NBS)

European Commission (2015)

“Solutions to societal challenges that are inspired and supported by nature, which are cost effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions. Nature-based solutions must benefit biodiversity and support the delivery of a range of ecosystem services.”

Multifunctional NBS

European Commission, DG RTD. 2021.
*Evaluating the impact of nature-based
solutions: a handbook for practitioners,*



The Parque Lineal Las Vegas, Portoviejo



Renaturation & revitalisation of flowing waters

Photo: Alcaldía de Portoviejo

NBS-Types:

- ▶ Rivers, wetlands
- ▶ Parks and green spaces

Challenges and benefits:

- ▶ Flood protection, stormwater drainage/runoff
- ▶ Ecological and social connectivity
- ▶ Biodiversity
- ▶ Urban regeneration
- ▶ Reconstruction and economic reactivation
- ▶ Creation of new public recreational and cultural spaces

Estimated benefits for proposed EU restoration targets

(Results from the EU Nature Restoration Law impact assessment)

- ▶ Estimates consider carbon benefits and other ecosystem services/ benefits
- ▶ Restoring EU peatlands, marshlands, forests, heathland and scrub, grasslands, rivers, lakes and alluvial habitats, and coastal wetlands (annex I): **€ 1,860 billion** (at an estimated **cost of € 154 billion**) to 2070
- ▶ Economic value of restored rivers (€ 2,500/ha) vs. unrestored rivers (€ 1,100/ha)

Photo: Highline, New York, Sandra Naumann



Climate mitigation potential: NBS and restoration

- ▶ Global net anthropogenic GHG emissions: 59 (\pm 6.6) GtCO₂-eq (in 2019)
- ▶ Ca. 25% caused by landuse, forestry, landuse change

Source: IPCC, 2022: Summary for Policymakers. In: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change



Photo: Rain Forest, Costa Rica, Sandra Naumann

Ecosystem	Estimated mitigation potential
Cropland	0.2 - 11.0 GtCO ₂ e/yr
Agroforestry	0.3 - 5.7 GtCO ₂ e/yr
Grasslands	0.15 - 1.5 GtCO ₂ e/yr
Terrestrial wetlands	0.7 - 0.9 GtCO ₂ e/yr
Coastal wetlands	Up to 0.8 GtCO ₂ e/yr

Source: Reise et al. , 2022: Nature-Based Solutions and Global Climate Protection. Assessment of their global mitigation potential and recommendations for international climate policy. Climate Change 01/2022. German Environment Agency, Dessau-Roßlau.

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It is likely that NBS potentials provided by scientific literature overestimate the realistic potential of NBS for climate change mitigation

Reise et al. 2021.

Limitations of NBS to deliver on biodiversity and climate change policy targets

- ▶ Limited land availability
- ▶ Ecological constraints: existing threats to ecosystems' health, biodiversity impacts, land use conflicts caused by current patterns of production & consumption as well as climate change
- ▶ Social, cultural, political and institutional barriers (e.g. silo-thinking, preference for traditional solutions; single-target planning)
- ▶ Risk of non-permanence
- ▶ Lack of capacity to design and implement locally adapted NBS (e.g. due to lacking communication of knowledge)

Challenges to the implementation of NBS

- ▶ Lack of a comprehensive evidence base on the effectiveness of NBS (as compared to engineered solutions)
- ▶ Multifunctionality of NBS: cross-sectoral approach to planning & implementation
- ▶ Lack of institutional know-how/openness to collaborate across sectors (e.g. to develop innovative, sustainable, inclusive solutions)
- ▶ Need for a greater involvement of the private sector in financing NBS
- ▶ Stakeholder engagement in the successful design and implementation of NBS
- ▶ Land use competition and related conflicts of interest/power imbalance
- ▶ Lacking approaches to consider trade-offs, including justice aspects

Need for policy action



- ▶ Set ambitious and binding targets at all levels (as done in the EU Nature Restoration Law proposal)
- ▶ Strengthen existing (EU) policies and accelerate implementation of key legal commitments
- ▶ Increase coherence between policies, objectives, indicators, etc.
- ▶ Strong communication & understanding of NBS benefits
- ▶ Provide adequate funding and integrate investment needs in national strategies and operational planning (also ensuring maintenance for long-term benefits)
- ▶ Introduce standards for NBS (design/implementation) and use green' public procurement for services
- ▶ Invest in pilot initiatives (e.g. demonstration projects)

Introduce standards for the verification, design and scaling up of NBS



Photo: Rainwater garden, Bratislava, Slovakia @medvedkudajlabku.sk

IUCN Global NBS Standards

- 1: Address societal challenges
- 2: Design at scale
- 3: biodiversity net gain and ecosystem integrity
- 4: Economic feasibility
- 5: Inclusive governance
- 6: Balance trade-offs
- 7: Adaptative management
- 8: Mainstreaming & sustainability

CEN/CENELEC (Europe)

Committed to contributing to the achievements of the Paris Agreement and the UN SDGs supporting the international climate agenda

Develop new standards to support the uptake of nature-based solutions in urban and rural areas and achievement of global climate objectives

Tool to achieve a successful green transition and supporting European policy ambitions for a greener and climate neutral European economy



Research needs



- ▶ Frequently monitor and assess the performance of NBS in different environments (in comparison with engineered solutions) to build a robust evidence base
- ▶ Improve knowledge on the NBS-biodiversity-ecosystem service nexus
- ▶ Identify trade-offs in trying to jointly address biodiversity and climate (or other objectives) and ways to mitigate those
- ▶ Assess limitations of NBS (e.g. ecological constraints)
- ▶ Explore potential of the integration of NBS in “new sectors” such as bioeconomy /circular economy

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Overcoming these challenges requires major systemic change in how we conduct and communicate interdisciplinary research, and how we organize and run our institutions. More fundamentally, fully integrating NBS as solutions to both the climate and biodiversity crises requires a new approach in economic thinking, shifting from a focus on infinite economic growth to a recognition that the energy and material flows needed for human wellbeing must remain within safe biophysical limits.

Seddon et al. 2020



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Science and Policy
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Thanks! Any questions?

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