Ensuring NbS for the Biodiversity-Climate-Society Nexus

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Overview

• Moving our focus from *promise* and *potential* to *pragmatic implementation* and *institutional power*

• 3 current expanding areas of work
  • NbS and trade-offs
  • NbS and values
  • NbS and governance

• 3 emerging hot topic areas
  • NbS and financing
  • NbS and health
  • NbS and transformative change
Acknowledging the complexity of NbS

Figure 2-1: A framework to support the first identification of potential investments in NBS

Is the NBS suitable at this location?

Identify NBS and approach to protect, enhance, restore, and create natural or modified ecosystems.

What are the desired benefits of the NBS?

Processes
- Infiltration
- Evapotranspiration
- Water storage
- Aquifer recharge

Functions
- Flood regulation
- Heat regulation
- Soil stabilization
- Water retention

Benefits for people
- Reduced flood risk
- Reduced heat stress
- Outdoor recreation
- Human health
- Biodiversity

Note: The information per NBS family is organized to provide an understanding of the processes, functions, benefits, and location suitability of NBS. The lists in the boxes are examples and not intended to be exhaustive.
1. Trade-offs (across the climate-biodiversity nexus)

Pörtner et al. 2021
## Multiple trade-offs (within NbS)

<table>
<thead>
<tr>
<th>Biophysical trade-offs</th>
<th>Governance trade-offs</th>
<th>Scale or temporal tradeoffs</th>
<th>Benefits trade-offs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Trade-offs among ecosystem services (e.g. carbon sequestration vs water flow)</td>
<td>• Trade-offs among different stakeholders with different values</td>
<td>• Trade-offs between addressing a local problem and tackling drivers of societal challenges</td>
<td>• Uneven class impacts (e.g. higher income ppl benefiting more)</td>
</tr>
<tr>
<td>• Trade-offs between biodiversity and societal challenges</td>
<td>• Trade-offs among those with power and those without</td>
<td>• Trade-offs that are generated outside a project area</td>
<td>• Uneven gender benefits</td>
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<td></td>
<td>• Trade-offs around knowledge (science vs ILK)</td>
<td>• Short term benefits (e.g. employment) vs longer term sustainability</td>
<td>• Costs of actions borne by those already not benefiting (e.g. green gentrification leading to displacement)</td>
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<td></td>
<td>• Trade-off among different decision-support tools (e.g. CBA vs other valuation)</td>
<td></td>
<td>• Lack of acknowledgement of nonmonetary and cultural benefits</td>
</tr>
</tbody>
</table>

Case study: Hanoi flood diversion planning
Balancing different types of benefits

Nguyen et al. 2022 Ecosys Services
2. Values and NbS

Source: O’Connor and Kenter 2019.
Case study: salmon restoration in Pacific NW, US

- Tulalip Tribes initiated Sustainable Lands Strategy (SLS) to build resilience through cooperative planning at the basin scale to generate net gains in the productivity and sustained health of fish and farm communities, while improving flood control, tribal culture and traditional knowledge, and environmental quality [multi-objective & multi-functional]

- Established active riparian buffers in "living fences" along farms in corridors; trees serve as a defensive barrier against damage to farms from debris during floods, and protect river habitat [co-benefits across coalitions].

- Together, stakeholder groups compiled and organized information on ecosystem services and their trade-offs and used it to generate a narrative document. The cultural narrative, accompanied by citations of the scientific background, sets the framework for scenarios related to specific management decisions [co-production of knowledge reflecting values]

Emcompassing values within NbS

- Reduces conflicts and manage trade-offs
- Increases capacity, awareness and support for NbS across more diverse coalitions
- Decision-support tools that reflect multiple conceptualization of values remain challenging
- Monitoring based on values and place-based contexts are key

See also: Cottrell 2022; Cardenes et al. 2021; Kiddle et al. 2021; Townsend et al. 2021; Welden et al. 2021; Venkataramanan et al 2020
3. NbS and Governance

Cook-Patton et al., 2021. See also Smith et al. 2022
Success factors for good NbS governance

- Existing capacity, such as the personnel or financial resources
- Local champions and advocates
- Supportive legal frameworks
- Cooperation across stakeholders
- Stakeholder engagement and attitudes, particularly co-design
- Alignment of activities across agencies including shared institutional structures or polycentric design
- Regulatory windows and experimentation with on-going research and monitoring
- Demonstration of co-benefits
- Availability of multiple sources of finance linked to multiple benefits

Brink et al. 2016; van der Jagt et al. 2017; Hopkins et al. 2018; McVittie et al. 2018; Martin et al. 2021
Ensuring effective stakeholder involvement

Example of Stakeholder Mapping of 15 NbS projects in EU

Zingraff-Hamed et al. 2020
Case study: Eco-DRR in Rio de Janeiro

• Problem: large numbers of landslides in favelas on outskirts of Rio de Janeiro. City wanted to improve with NbS (tree planting, land stabilization, etc)

• Stakeholder involvement: the high level of informality in favelas excluded important actors from decision-making and hindered different authorities from being actively engaged in areas at risk from landslides.

• Trees were planted by external actors, but security issues impeded a broader implementation of the reforestation program and few benefits will be seen until the full protective function is achieved, so project beneficiaries were skeptical of benefits

Sandholz et al. 2018
NbS for integration across nexus issues

Carvalho et al. 2022
1. NbS and Financing

COMPANIES: USE OF OFFSETS BY TARGET YEAR

- Companies with net zero targets (n = 702)

Net zero target year:
- By 2030
- 2031 - 2040
- 2041 - 2050
- 2051 or later
- Not specified

NetZero Tracker, 2022
Stimulus and 'Recovery’ Measures in Southeast Asia: Nearly complete absence of NbS

• Vietnam
  • Cut in environmental taxes by 30%

• Indonesia:
  • Loosened its permitting restrictions for timber producers,
  • Omnibus bill (Nov 2020) limiting public participation in environmental assessments & scrapping some environmental permitting altogether
  • Deregulating the mining industry (May 2020)
  • Subsidizing state-owned oil and gas and electricity companies and airlines

• Philippines
  • Feed-in-tariff allowance eliminated
  • Increased infrastructure budget to modernize highways, airports and ports

McElwee et al. 2020
2. NbS and Health

Bapna et al. 2019
3. NbS and Transformative Change

Pascual, McElwee et al., 2022, *Bioscience*
Principles for transformative governance

Pascual, McElwee et al., 2022. See also Fougères et al. 2021; Visseren-Hamakers et al. 2021
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Thank you!
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- Carmichael and McDonough 2019 Community Stories: Explaining Resistance to Street Tree-Planting Programs in Detroit, Michigan, USA. *Society and Natural Resources* 32: 588–605
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• Smith, P. et al. 2021 How do we best synergize climate mitigation actions to co-benefit biodiversity? Global Change Biology