Catapulting nature onto the climate change adaptation agenda: opportunities and barriers of nature-based solutions

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This project has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under Grant Agreement No 776681
Nature-based solutions

“Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. (…) 

Nature-based solutions must therefore benefit biodiversity and support the delivery of a range of ecosystem services (EC, 2020)
Examples of nature-based solutions

Source: World Bank, 2019

Source: Oxford NBS Initiative, 2021
If the world is to meet the climate change, biodiversity, and land degradation targets, it needs to close a USD 4.1 trillion financing gap in nature by 2050 (UNEP, 2021).

$700 billion annual financing gap by 2030 (Nature Conservancy 2020)
Main research questions

What governance factors, enablers and barriers of ‘successful’ NBS?

What governance transformations are needed to upscale NBS?
NBS governance enablers: a case study analysis

Results from Martin et al., 2021

Co-designed nature-based solutions for landslide risk mitigation in Nocera Inferiore (Italy): The grey versus green battlefield

Carrots and sticks for conserving the forest: A Nature-based Solution for Wolong Nature Reserve (China)

Green is the new grey on Munich’s Isar River (Germany): Innovative nature-based solutions boost ambitious flood protection scheme
Governance innovation was demonstrated in 3 key areas:

- **Polycentric governance**: novel arrangements across sectors and scales
- **NBS co-design**: inclusive stakeholder participatory processes
- **Public financing available**

Policy brief available [here](#)
PHUSICOS experience: Jorekstad receded flood barrier

- Receded flood barrier to allow more space for flooding
- Protection of sport facilities, housing, farmland
- Reduced sediment deposition and shallowing of river
- Restoration of flood plain and riparian vegetation
Jorekstad: NBS implementation barriers

1. Lack of sense of urgency among policymakers
2. Lack of public awareness and support
3. Risk aversion and resistance to change
4. Misalignments between short-term plans and long-term goals
5. Functionality and performance uncertainties
6. Perceived high cost
7. Lack of available financial resources
8. Lack of financial incentives
9. Property ownership complexities
10. Procurement challenges

Solheim et al. 2021 Sustainability, 13, 1461.
Scoping study of opportunities and barriers of NBS

- Systematic literature review
- Workshop results, grey- and peer-reviewed literature
- Meta-analysis of 252 enablers and 264 barriers
- Coding using Nvivo
Key results: barriers

- Grey measure dependency
- Lack of expertise and knowledge
- Lack of evidence on NBS efficiency and costs
- Risk aversion, uncertainty and conflicting views
- Sectoral silos
- Time needed for NBS to show results
- Lack of legal backing and policies
- Communication ownership and methods
- Land ownership and availability
- Lack of political will and support
- Equity and justice barriers
- Potential negative effects of NBS
- Complexity and scales of legal landscape
- M & E barriers
- Complexity in bidding or procurement processes
- Complexity in funding landscape
- Difficulties upscaling

Martin et al., unpublished
Key results: barriers

- Human resources and capacities
- Socio-cultural
- Economic/financial
- Policy/legal
- Environmental and technical
- Education
- Political

Martin et al., unpublished
Key results (preliminary): enablers

- Policy and legal instruments
- Funding and financial tools & support
- Inclusive and wide stakeholder engagement
- Polycentric arrangements
- Raising awareness
- Better evidence and NBS valuations
- Flexibility and adaptiveness
- Knowledge products and guidance
- Multifunctionality and co-benefits of NBS
- Education and knowledge exchange
- Social acceptance
- Opposition to grey solutions
- M&E
- Aesthetics
- Champions and advocates
- Equity & justice
- Political will and support

Martin et al., unpublished
How can we close the USD 4 trillion financing gap?

• Public?
• Private?
• Blended?
Divestment from nature-negative investments (EU taxonomy)

<table>
<thead>
<tr>
<th>Domestic Government</th>
<th>Private Capital</th>
<th>Public ODA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection of biodiversity and landscape, $53b</td>
<td>Agro, forestry &amp; fishing, $23b</td>
<td>Environmental policy and other, $8b</td>
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<tr>
<td>Water resources, conservation and land management, pollution control and other natural resources budget, $17b</td>
<td>Pollution abatement, wastewater and environment protection</td>
<td>Conservation NGOs, $1.8B</td>
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<tr>
<td>Public ODA</td>
<td>$2.4b</td>
<td>Other</td>
</tr>
</tbody>
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Note: These figures are the midpoint between the lower and upper bounds of annual investment. Source: Vivid Economics, adapted from OECD, IMF and other public data sources listed in the Annex.
Summary

• Nature-based solutions offer strong benefits across the climate-biodiversity nexus
• Yet, there is a huge funding & governance gap on needed investments in nature
• Prominent enablers include
  – Policy and legal instruments
  – Inclusive stakeholder engagement
  – Adequate financing
  – Polycentric governance arrangements
• On financing, perhaps greatest hope is EU’s focus on a ‘taxonomy’ for nature-negative investments
Publications


Thank you!

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This project has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under Grant Agreement No 776681
PHUSICOS

• May 2018 – April 2023
• Transdisciplinary consortium of 15 partners from 7 European Countries
• Aims: demonstrate that NBS provide sustainable and cost-effective measures for reducing risks of extreme weather events in rural mountain landscapes
NBS governance enablers: a case study analysis

- Methods: semi structured interviews (N=47), desktop-based review