Photo: Malgorzata Blicharska

Making sense of Nature-based Solutions: Governance, Knowledge and Justice Issues

UUniCORN Insight Series

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Summary

Nature-based Solutions (NbS) are increasingly promoted as responses to interconnected climate, biodiversity, and societal challenges. This report explores what NbS are, clarifies where conceptual confusion arises, and outlines their benefits and limitations, focusing on decision-making, knowledge and justice. The themes in the report were shaped at a workshop held in May 2025 with a newly established NbS network.

The NbS network, supported by UUniCORN catalyst funding, is investigating how the use of NbS might help mitigate conflicts related to biodiversity protection and natural resource use. Its vision is to develop new research collaborations within UU that contribute to healthy, resilient, and biodiverse landscapes while also meeting diverse societal needs. Insights from network members are featured throughout the report.

1. What are Nature-based Solutions?

Over the past decade, Nature-based Solutions (NbS) have gained increasing attention across a range of sectors, particularly as responses to the impacts of climate change[1]. The concept emerged from efforts to manage natural systems in ways that benefit both people and nature, shifting away from practices that work against nature, such as resource extraction.[2] NbS can be applied in both urban and rural contexts and at various scales, from small-scale interventions such as green roofs to large-scale projects like wetland restoration. However, most attention to date has focused on urban areas, with less emphasis on protecting and expanding existing green spaces in rural settings.[3]

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There are several definitions of NbS, with the most commonly cited coming from the European Commission (EC) and the International Union for Conservation of Nature (IUCN). The EC defines NbS as "actions which are inspired by, supported by or copied from nature" that aim to address a range of environmental, social, and economic challenges in sustainable ways.[4] Accompanying this definition is a handbook from the EC on evaluating NbS impact and determining whether an intervention qualifies as NbS. [5] The IUCN's Global Standard for NbS defines them as "actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits", and outlines eight criteria for identifying and assessing NbS interventions.[6]

A recent academic review of definitions identifies four core characteristics of NbS: they (1) are inspired and powered by nature, (2) address societal challenges, (3) provide multiple benefits including biodiversity gains, and (4) are effective and economically efficient. The review also outlines exclusion criteria, helping to further clarify what should not be labelled as NbS.[2] Such efforts to define and establish criteria for NbS aim to address the concept's ambiguity, a focus area of the network, addressed in the next section.

2. Conceptual Ambiguity

The ambiguity arises not only from the variety of existing definitions, but also from the frequent conflation of NbS with related approaches such as restoration or ecosystem-based management.[2] NbS for instance differs from restoration by placing greater emphasis on societal benefits, which in turn should attract broader participation.[7] It has been argued that NbS must be explicitly developed in relation to existing concepts in order to clarify their added value and prevent them from being reduced to a repackaged version of older ideas.[8] For example, it has been suggested that NbS risk losing their transformative potential if they become merely a relabelled concept.[7] This concern was also raised in the NbS workhop when one network member commented that NbS already feels like "just another term to group nature connections."

Network Insight: Evolving Conservation
Jayne Glass, Department of Earth Sciences

Glass' research traces how conservation in Scotland has evolved from a focus on designated protected areas to broader approaches like rewilding that aim to restore natural processes at scale and across land uses. These shifts increasingly intersect with NbS thinking. This speaks to observations that NbS may be relabelling existing approaches rather than offering something conceptually distinct.[9]

3. Benefits and Challenges

While NbS offer potential benefits to nature and society, they also face many challenges. A recent discourse analysis identifies two dominant narratives: one that frames NbS as a tool to "leverage the power of nature" through multiple co-benefits; and another that views NbS as a "dangerous distraction" that enables the continuation of an unsustainable and unjust status quo.[10] Although evidence shows that NbS can match traditional approaches to urban development in effectiveness and simultaneously provide added social and environmental benefits,[11] there remain significant gaps in understanding, particularly about how to assess non-market values such as recreation or well-being.[12]

The breadth of the concept, which helps connect actors across science, policy, and practice, also contributes to definitional ambiguity.[13,14] Some see the strength of NbS in their integrative and systemic approach, which can move beyond tokenistic 'green' framing.[8] Others argue NbS are being used instrumentally, presented as win-wins while masking trade-offs and maintaining a separation between people and nature.[10,14] The use of the NbS concept also suffers from limited

awareness, knowledge gaps, and implementation challenges,[15] all of which will require inclusive and informed policies if these issues are to be addressed.[14] The following sections focus on two key areas identified by the network as critical to enabling more effective NbS: decision-making and knowledge and justice.

4. Decision-Making and Governance

Network Insight: Policy and Biodiversity
Malgorzata Blicharska, Department of Earth Sciences

Blicharska's work shows how EU policy frameworks shape how NbS are recognised, by favouring certain ecosystems, such as forests or wetlands, while excluding others like ponds. This shapes where and how NbS are applied.[16] Her broader work shows that biodiversity loss undermines all SDGs, an urgent reminder that NbS must do more than offer short-term fixes and highlighting the role of decision-making structures in determining outcomes.[17]

Several challenges are present in decision-making and governance around NbS. Although NbS may offer decision-makers a clear and immediate focus,[18] the solutions themselves are inherently political.[19] They are shaped by power and enacted by a range of actors with different values and priorities, which can lead to conflict, particularly when some voices are excluded.[11,20] Participation is essential, but often becomes tokenistic, reinforcing existing inequalities.[21]

Network Insight: Land Matters
Emma Elfversson, Department of Government

Elfversson's work highlights how land tenure arrangements shape who can take action on climate adaptation, and how. Strategies like ecosystem restoration and tree planting are not only technical issues, they depend on who owns or controls the land, which is an essential yet often overlooked aspect of decision-making that has direct implications for equitable NbS implementation.[22]

Traditional planning systems are also often locked into "path dependence," blocking alternatives: shifting to NbS requires systemic changes in education, placemaking, institutional reform, and valuation methods.[8,18]

5. Knowledge and Justice

Network Insight: Decolonising Knowledge
May-Britt Öhman, Centre for Multidisciplinary Studies on Racism

Öhman's work challenges dominant mapping and land-use frameworks by foregrounding Indigenous knowledge systems, particularly those of Sámi communities. She proposes methods for decolonising co-production processes, showing how research and planning can include rather than erase diverse understandings of land and stewardship.[23]

The themes of knowledge and justice are closely connected in the context of NbS. Important dimensions related to justice in NbS use can relate to recognition and distribution of knowledge, and processes that allow for meaningful input.[24] NbS must therefore draw on local, traditional, and scientific knowledge to avoid reinforcing existing inequalities.[3] When this does not happen, the application of NbS risks enabling dispossession; for example, when land is taken from vulnerable groups.[1] Justice is often invoked in NbS literature, yet rarely defined or operationalised, highlighting the importance of making justice aspects more explicit.[19] The adoption of a nature-based justice framework that centres long-term equity and empowering participation may also help.[1]

6. Next Steps

The NbS network will meet again in Autumn 2025 to discuss the themes in this report in more detail and develop ideas for a collaborative research paper and potential future research projects. If you would like to become part of this network, please reach out to us.

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About UUniCORN

Uppsala University Conflicting Objectives Research Nexus (UUniCORN) is the first of Uppsala University's Future Institutes (UUniFI), dedicated to advancing world-leading research on complex societal challenges through a transdisciplinary lens. UUniCORN seeks to initiate, facilitate and conduct research on goal conflicts in sustainability transformations, and to contribute to societal transition through collaborative action.

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