**Governing Natural Climate Solutions: prospects and pitfalls**

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## Abstract

There is widespread and growing enthusiasm about Natural Climate Solutions (NCS), yet concerns about their social and environmental outcomes are intensifying. These outcomes are contingent on governance arrangements. This paper aims to synthesise recent social science work on climate and natural resource governance with the growing literature on NCS rooted in the natural sciences. It does so by examining three interlinked elements of governance - discourse, institutions and actors. The review finds that crisis narratives, a narrow focus on carbon, and challenges with integrating institutional complexities into modelling studies risks marginalising dynamics associated with key governance concerns, including land rights and inequalities. Reflecting on these concerns the paper outlines three priority areas for future work on NCS: Access, Burden-sharing and resisting Co-option. Despite the promise and appeal of NCS, if fundamental governance questions continue to be marginalised, the agenda may end up entrenching a narrow range of interests.

**Keywords**: Natural Climate Solutions; Nature-Based Solutions; Governance; Knowledge; Discourse; Institutions, Land Tenure; Reforestation, Environmental Politics

## 1. Introduction

Nature-based solutions, the working with and enhancing of nature to help address societal goals, has emerged over the last decade as a key concept guiding strategies to address interlinked concerns regarding climate change, biodiversity and human wellbeing. Within this broad ambition, recent attention has been particularly focused on climate change, with much of the literature tending to focus on quantifying the mitigation potential of Natural Climate Solutions (NCS[1]) such as protecting and restoring ecosystems including forests, peatlands and mangroves, and adopting management practices like agroforestry (Griscom et al. 2020; Seddon et al. 2020). NCS hold much promise, especially if they are implemented rapidly and designed for longevity (Girardin et al. 2021). Unlike other forms of climate mitigation strategies such as carbon capture and storage (CCS) and geoengineering strategies, NCS may deliver a range of co-benefits such as biodiversity conservation and wider social benefits in the form of economic development or increased productivity. However, as the meanings, actors and strategies associated with NCS have proliferated (Nesshöver et al. 2017; Cohen-Shacham et al. 2019; Escobedo et al. 2019) concerns about the actual environmental and social impacts of NCS are growing. These include, for example, the risks of inappropriate afforestation on savannahs and in natural forests (Veldman et al. 2020; Heilmayr et al. 2020), the potential for social exclusion in the design and delivery of NCS projects (Woroniecki et al. 2020) and unfair distribution of associated costs and benefits (e.g. Kabisch et al. 2016; Wells et al. 2020).

Governance, the process by which society steers itself and makes decisions, is key to understanding the impacts and outcomes related to NCS, but has received relatively limited attention to date. This paper presents a critical interpretive review (Gupta et al. 2020; Rowe, 2014) which aims to synthesise recent work on climate and natural resource governance with the growing literature on NCS, rooted in the natural sciences. The analysis aims to provide a platform for reflecting on key issues related to the future prospects and potential pitfalls of the NCS agenda. To do so it engages three central and interwoven elements of NCS governance - discourse, institutions and actors – which together provide a lens with which to examine and review the literature and offer insights to avenues for enriching future work on NCS[2]. Discourses - defined here as socially shared meanings about phenomena – are central to understanding governance because of their power to frame problems, solutions, and questions concerning who should act, how and at what scale (Svarstad et al. 2018; Nightingale et al. 2019). Discourses are co-constituted with knowledge, and the production of knowledge is intimately associated with the power relations underpinning discourse development and contestation, including with respect to the evolution of NCS (Woroniecki et al. 2020). Examining governance therefore entails considerations of what kinds of knowledge are generated, authorised and deployed in shaping the decisions made by actors operating individually and collectively at different

[1] Natural Climate Solutions (NCS) are sometimes also known as Nature-Based Climate Solution (NbCS). There are a huge range of activities that could be considered under these umbrella terms, but the main focus of the literature, and this review, is on activities associated with carbon mitigation.

[2] There are a range of theoretical approachs to governance, and the concepts of discourse, institutions and actors and their interactions (see e.g. Jørgensen and Phillips, 2002). The conceptualisations drawn on to underpin this review are rooted in a critical realist perspective because it offers a promising meta-theoretical approach to interdisciplinary work across the natural and social sciences (Bhaskar et al. 2010).

scales (Turnhout 2018; van Kerkoff and Pilbeam, 2017). The final element of governance considered here is institutions; the formal and informal rules and norms that enable and constrain the actions of individuals and groups and which are central to shaping decision-making processes. Institutions can be conceptualised as resulting from discourse (e.g. Di Gregorio et al. 2017) and are a critical element of governance since they dictate how different actors leverage power in setting agendas, dictating policy and law and influencing ideologies (after Lukes, 2004). By adopting a tripartite discourse-institutions-actors framing of governance, the review engages with discursively-orientated, structure-orientated and actor-orientated framings of power within work on governance (Svarstad et al. 2018). This article examines how the literature engages with these governance elements – discourse, institutions and actors - with respect to NCS across a range of scales and finds that, to date, governance dimensions have received minimal attention. The paper extends the analysis to reflect critically and constructively on existing research and practice and outlines an agenda for incorporating governance more substantively in future work on NCS.

## 2. Natural Climate Solutions – Discourse, Institutions, Actors

While there are an increasingly wide range of strategies associated with NCS, each with their own governance intricacies, this review begins by characterising the dominant features of NCS discourse, key institutions and actors involved, and concurrently highlights salient debates within recent governance literature.

The core thrust of the dominant NCS discourse promoted by key proponents such as the, 'The Nature Conservancy'[3], International Union for the Conservation for Nature (IUCN), and the European Union is that they can contribute significantly to climate mitigation. Following Griscombe et al. (2017), NCS are thought to have the potential contribute up to one third of the carbon emissions reductions needed in the next decade to avoid 2°C of warming. As Girardin et al. (2021) showed recently, NCS could reduce peak warming by 0.1 - 0.3°C, depending on the scenario[4]. While there is potential for NCS to deliver a range of co-benefits, such as protecting biodiversity and supporting livelihoods, these are often comparatively neglected (Seddon et al. 2019; Seddon et al. 2020). This reflects wider climate discourses. Although this defies simple characterisation, two threads are particularly prominent: crisis and carbon. Although crisis has been a defining characteristic of the climate (and other environmental) discourses for decades (Adger et a. 2001), the recent adoption of the 1.5° target at the Paris Climate Conference and subsequent IPCC Special Report on Global Warming of 1.5°C (IPCC, 2018) has heightened the sense of crisis and re-invigorated climate-related deadlines (Asayama et al, 2019; Hulme, 2019). In particular, there has been an emphasis on reaching 'net zero' carbon emissions on timescales perceived to require an 'emergency' response. The emphasis on 'net zero' is typical of other major threads within climate discourses; the narrowing of scope to focus on carbon (McDermott 2014).

[3] See: https://www.nature.org/en-us/what-we-do/our-insights/perspectives/natural-climate-solutions/

[4] The cooling impact of NCS continues after peak temperature is reached. Girardin *et al*. (2021) show that in scenarios consistent with 1.5°C, NCS could reduce warming 0.4°C by 2100.

While stressing the importance of climate action is essential, the governance literature raises several pertinent issues related to the crisis and carbon elements of contemporary climate discourse and its influence on NCS discourse. First, the carbon-focus reduces the range of 'problems' that are considered to require 'solutions'. While there are valuable studies that situate NCS among other mitigation options at a global scale (e.g. Fuss et al. 2018), the carbon focus risks diverting attention away from deliberation of how the multiple problems facing society might be prioritised and whose voices are, and can be, heard. Although NCS involve activities which will dramatically alter people's livelihoods, identity, relationships with the land and each other (in both positive and negative ways) ultimately it is the carbon value which is most prominent in discussions of NCS. Yet, with the exception of biodiversity (Seddon et al. 2019), to date, there has been minimal specific or detailed consideration of the presence and extent of trade-offs associated with different modes of NCS and wider development agendas (Martín et al. 2020). Secondly, the crisis narrative exacerbates the narrowing of concerns since the urgency of addressing carbon emissions begins to dominate all other concerns. The 2019-2020 coronavirus pandemic illustrates the reality of emergency politics in several ways, including the side-lining of all other policy objectives. As Hulme (2020) notes, 'meeting the challenge of climate change for future human well-being demands a proliferation of diverse policy goals, the very opposite of what states of exception bring into being'.

The increasingly carbon and crisis centric character of the climate discourse feeds-off and re-enforces particular forms of knowledge generation. There has been a preponderance of natural science and modelling studies examining the potential of NCS for mitigation (e.g. Bastin et al. 2019; Busch et al. 2019; Griscom et al. 2017; Griscom 2020; Roe et al. 2019; Girardin et al. 2021)[5]. There remains significant debate on the potential of NCS, with estimates of carbon sequestration of tree-planting, for example, varying more than 10-fold (Holl and Brancalion, 2020). While the uncertainties in the modelling work required to estimate ecological potential will narrow over time, critical questions regarding what might be feasible or desirable in particular local contexts are conspicuous by their absence (Forster et al. 2020). Although modelling work frequently refers to the importance of considering social and governance issues such as land and resource rights in NCS, it does not explore what such considerations might actually mean for analyses of mitigation estimates.

In neglecting or making simplistic assumptions about who owns, manages and makes decisions about land, modelling studies entail largely unaccounted for uncertainties which mean many studies examining the potential of NCS essentially represent estimates of the 'theoretical maximum'. This can be useful for situating NCS potential with respect to other climate mitigation strategies and helping to guide prioritisation of future areas of research. However, in light of recognition that such estimates are 'unrealistic' (Griscombe et al. 2019), this approach raises the question: 'What effect does this have on governance processes?' One outcome is that such estimates are used to ramp up ambition (See e.g. Roe et al. 2019). The recent proliferation of tree planting and restoration campaigns[6] are testament to the

[5] This reflects wider trends in climate research, as Overland and Sovacool (2020) show, between '1990 and 2018, the natural and technical sciences received 770% more funding than the social sciences'.

[6] These include the Bonn Challenge to restore 350 million hectares of degraded land by 2030, the African Forest Landscape Restoration initiative to restore 100 million hectares in Africa by 2030, an initiative that has secured commitments totalling 125% of the target, and at least two campaigns to plant a trillion trees.

recent successes of the strategy. How this ambition will translate into actions on the ground remains largely unknown, although challenges with existing strategies such as Payments for Ecosystem Services (PES) and Reducing Emissions from Deforestations and Degradation (REDD+) and the history of green land grabs (Peluso and Lund, 2011; Larson et al. 2013) gives reason for tempering any optimism and encouraging reflection on continually ramping up global ambition without recourse to local contexts.

A further consequence is, as Bellamy and Geden (2019) argue, that globalised estimates of the carbon dioxide removal potential of different technologies deflects attention away from localised (national and sub-national) initiatives and serves to obscure rather than clarify the conflicting interests and trade-offs involved in governing NCS. One illustrative example is the work of Bastin et al. (2019) whose high-profile but widely derided (e.g. Friedlingstein et al. 2019; Veldman et al. 2019; Lewis et al. 2019) estimates of global potential for forest restoration supposedly excluded areas classified as urban but actually designated areas home to 2.5 billion people as eligible for restoration, including the city of Kinshasa, the capital of the Democratic Republic of the Congo (Luedeling et al. 2019). Similar shaped holes appear in the wider Nature-based Solutions literature; of the 390 empirical and modelling papers on the Nature-Based Solutions Evidence Platform[7] only 40 (10%) are in Africa (see also Chausson et al 2020). These issues, are not, however, *merely* innocent matters regarding data availability, methods or modelling techniques. As Nightingale et al. (2019) note, such outcomes are embedded within the structural politics of whose interests are prioritized and whose knowledges are considered legitimate for addressing climate change.

Understanding the conflicting interests and trade-offs inevitably involved in governing NCS requires, *inter alia*, an appreciation of the institutions and actors which operate across a range of scales. While the attention of key actors in the NCS space has, to date, been focussed on the global and international institutions (e.g. the UN Green Climate Fund and the Global Environment Facility and international NGOs such The Nature Conservancy), and how they will finance NCS (Seddon et al. 2020), central to considerations of NCS are institutions relating to land tenure and ownership (Rudel and Hernandez, 2017). These institutions and actors play a key mediating role in guiding decisions over land-use (e.g where to protect ecosystems, how and who decides), the distribution of benefits accruing from changes to land-use or management practice (e.g. how landlord-tenent arrangements shape the distribution of benefits associated with payments for the adoption of different management techniques) and the dynamics of marginalisation and livelihood security in communities (e.g. the security of land-users' access to land in light of incentives introduced for restoration initiatives). Some studies of NCS marginalise the importance of such institutions by 1) providing estimates for NCS that rely on reductionist assumptions of cost estimates that are unrelated to 'complex and geographically variable range of costs and benefits associated with NCS' (Griscom et al. 2020:4) and 2) neglecting, or making only token reference to, the importance of respecting rights without reflecting on what doing so might mean for the deployment of NCS and their potential contribution to mitigating climate change (Forster et al 2020).

[7] Available: https://www.naturebasedsolutionsevidence.info/evidence-tool/

In side-lining the institutional arrangements that will largely determine the impacts of NCS, much of the rhetoric of NCS echoes the 'quick and easy' and 'win-win'/'triple-win' narrative (e.g. Maes and Jacobs, 2015; Turner, 2018) that characterised the early work on REDD+ (Gupta, 2012; Hansen et al. 2009). There are three key threads in the work on institutions which are central to efforts to integrate institutional concerns into future work on NCS: appreciating the variety of land rights; tensions over land-rights and policy responses; and the relationship between land rights and management.

Tenurial institutions shape the distribution of benefits related to land. In revising Ostrom's work, Sikor et al. (2017) helpfully articulate the differences between authoritative rights (definitional and allocative), control rights (management, exclusion, transaction, monitoring), and use rights (direct and indirect). Importantly, they highlight how local actors are often excluded from authoritative and control rights. This understanding of land rights highlights a core difficulty in governing NCS. Projects require targeting and incentivising actors with authoritative and control rights, but doing so will tend to marginalise local users of land from the decision-making process and from the benefits of NCS, e.g. payments or other incentives.

The distributive effects of land tenure mean that it is also deeply contested across scales and actors – within families, between groups within society, between statutory and customary authorities, and between states. The tensions and resolutions over land and the political settlements associated with land often explain why similar institutional arrangements can lead to divergent patterns of land-use and benefit distribution (Di John and Putzel, 2009). Awareness of conflicts over land also highlights that efforts to change land-use or management practices are rarely zero-sum with respect to these conflicts, i.e. they create winners and losers. Such conflicts are not readily incorporated into large-scale quantitative analysis because they are, as Scott (1998) puts it, 'illegibile'. The long-standing policy response to this illegibility is to formalise land tenure, i.e. to generate a statutory record of ownership and incorporate governance within the system of state legislation. Despite being widely promoted, there are widespread concerns that formalisation processes ultimately favour wealthier and more powerful actors who are able to leverage formalisation processes for their benefit (Putzel et al. 2015;, Hirons et al. 2018). A contextualised understanding of the impacts of actual NCS efforts 'on the ground' is vital to minimising the risk that they unintentionally exacerbate inequalities.

While institutions are widely held to be central to sustainability, an understanding of how different actors can foster effective institutions remains lacking (Cumming et al. 2020). Of particular relevance for NCS is the lack of a straight-forward relationship between tenure institutions and land management. As Assaga et al. (2020) show, the relationship between tenure and sustainable land-use decision making depends on which elements of tenure security (legal, *de facto*, perceived) and which specific management (e.g. tree planting, soil improvements, tree conservation) practices are considered. Furthermore, the dynamics are mediated by a number of factors, such as access to credit and knowledge which leads to contradictory outcomes related to formalisation. Given the multiple and contested nature of land rights, and the lack of any simple relationship between land ownership and management that can be leveraged for delivering NCS, 'win-wins' should be considered largely mythical.

Rather than delivering 'win-wins', the impacts of efforts to implement NCS will likely have a range of social and environmental outcomes. Understanding and navigating this governance landscape requires a much more comprehensive contextualisation of NCS in specific places in order to shed light on the conflicting interests and trade-offs involved in deploying NCS. This requires, as Markusson et al. (2020) argue, a much greater role for the humanities and social sciences in developing insights into the cultural, ethical, legal, social, and political issues that greenhouse gas removal techniques, such as NCS, raise (see for example, Palomo et al. 2021). Maximising the insights a multi-disciplinary perspective can offer requires working across a range of scales. For example, what Meyfroidt et al. (2018) call 'middle-range' theories can offer locally contextualised analyses which describe causal mechanisms of land-use and their linkages with sustainability concerns. And Peng et al. (2021) have helpfully started reflecting on how to incorporate 'people' and 'politics' into Integrated Assessment Models (IAMs). These are promising avenues for blending decontextualized and narrowly conceived analyses with vital detailed local-level studies.

Despite decades of calls for interdisciplinary work on climate change, this review of the literature on NCS and governance has highlighted both the dominance of natural science modelling work, and the imbalance between research rooted in the natural sciences and research in the social sciences examining the influence of discourse, institutions and actors in shaping the governance of land-use at different scales, especially at a local level. Integrating these approaches in ways which deliver appropriately contextualised analyses that incorporate and highlight (rather than obfuscate) a wider range of governance considerations is essential. This paper now turns to outline a future agenda for research on NCS, highlighting in particular three overarching avenues for addressing the challenges raised in this section.

## 3. Centre governance for more effective and equitable Nature-Based Climate Solutions: A research agenda

There are both instrumental (i.e. increasing effectiveness) and normative (i.e. increasing equity outcomes) arguments for pursing a greater engagement between the natural and social sciences in future work on NCS and their governance. There is a great diversity of potential theoretical and methodological avenues for amplifying the consideration of governance in NCS, and prescriptive approaches are likely to lack the flexibility to respond to different contexts. Instead of foreclosing exploration of integrative methods, here I offer an overarching set of guiding principles that can serve as the foundation of such efforts. Three key issues sit at the heart of work on NCS to help centre governance considerations: Access, Burden-sharing and Resisting Co-option. Table 1 provides illustrative examples of the questions that engaging with these concepts provokes with respect to various forms of NCS. Approaches to these questions span the elements of governance reviewed above since they examine discourse (e.g. questions related to resisting co-option of NCS knowledge to support existing economic and political structures), institutions (e.g. questions on land rights and institutions) and actors (e.g. questions regarding who has power over decisions). Some, but crucially, not all, of these illustrative questions can be addressed directly through an evolution of modelling studies that currently dominate research on NCS. Taking this agenda

forward, not only requires augmenting and combining existing approaches to research, but also pursuing a greater balance in terms of financing and research effort between the different disciplines.

Table 1. *Illustrative questions provoked by the framework for integrating governance issues into future work on NCS* (categories of NCS after Griscom et al. 2020)

| | | **Access** | **Burden-Sharing** | **Resisting Co-option** |
|---|---|---|---|---|
| **Natural Climate Solution Pathway** | **Protecting (e.g. avoided conversion of forests)** | - Who is deciding where and how to protect an ecosystem?<br><br>-Do local people and land/resource users have a voice and influence? And how are they represented in research and projects? | - Who, and what activities, are being excluded by conservation efforts? What mechanisms, e.g. lack of recognition of customary land rights, underpin exclusionary processes?<br><br>- How are non-financial burdens, such as sense of place and identity being incorporated in research and decision-making practices? | - Who is adopting the discourse on NCS, and why?<br><br>- How are fossil fuel industries utilising NCS to delay decarbonisation? |
| | **Managing (e.g. trees in agricultural lands)** | - Who has access to information on land management options and financial support?<br><br>- How are payments to incentivise adoption of management practices distributed? | - Who is bearing the cost of adopting new management practices, and why?<br><br>- How do costs vary across social groups (e.g. gender, ethnicity)? | - How visible are the people managing land and their interests in the NCS discourse?<br><br>- Are there mechanisms in place to de-centralise decision-making authority? |
| | **Restoring (e.g. mangroves)** | - How are benefits from restoration dis-aggregated across society and scales?<br><br>How is access and control over monitoring and enforcement processes and technologies distributed? | - How are the financial and non-financial costs distributed across scales and between different groups (including at a local level)?<br><br>- How are different people's views regarding burden's included and represented in research and practice? | - How are potential avenues for the entrenchment of existing inequalities and grievances by NCS efforts being communicated?<br><br>- How are a diversity of values (beyond carbon) integrated into research and decision-making? |

Access, the ability for people to derive benefits, has long been a central concept for scholars of natural resources (Ribot and Peluso, 2003; Hansen et al. 2019). The concept of access incorporates issues concerning land and resource rights, but also goes further to include other structural and relational modes of gaining, maintaining and controlling access, including access to technology, access to capital, access to markets, access to labour, access to opportunities, access to knowledge, access to authority, access through social identity and access via the negotiation of other social relations. Understanding the dynamics of access, both in terms of which actors have access to decision-making processes across scales, and who has access to the benefits associated with NCS, is central to shaping governance processes away from crisis and carbon-centric, globalised narratives that risk perpetuating and exacerbating social inequalities.

Understanding the dynamics of burden-sharing is key to the governance of NCS. There is a long history of environmental and conservation projects placing significant burdens on predominantly poor people in the service of addressing globally conceived problems like climate change and biodiversity loss (see e.g. Büscher and Fletcher, 2020). In further developing NCS, it is essential that burden-sharing considerations are dis-aggregated to include socially differentiated groups (including for example, gender, ethnicity, wealth) and distinguish between financial and non-financial burdens (e.g. the loss of livelihood and sense of identity that could be associated with changes in land-use practice). Considerations of who pays for climate mitigation and adaptation within the international climate policy-frameworks have already received considerable scholarly and policy-attention (e.g. Leimbach and Giannousakis, 2019). However, work that integrates such considerations, and incorporates non-financial concerns such as justice and equity across scales, to examine how burdens are distributed in places where NCS might eventually 'land' is relatively rare (see Forster et al's (2020) work on BECCS and afforestation for a recent exception).

Co-option of knowledge results from the strategic utilisation of knowledge to support existing economic and political systems in ways which are unintended and uncontrollable by those that produce the knowledge. The concept of participation is archetypal of this co-option (Michener, 1998; Turnhout et al. 2020). Not only has the notion of participation failed to live up to the intended objective of empowering groups previously marginalised from development processes, the co-option of the term by dominant groups means that the issues participation set out to address are actually reinforced and ultimately legitimised through the term. With respect to NCS, there is particular concern that work on NCS can be co-opted by the existing political hegemony to entrench and legitimise existing modes of economic organisation that are dependent on fossil fuel extraction (Kotsila et al. 2020; McLaren and Markusson, 2020).

Despite much of the existing work on NCS outlining sets of principles or best practice for implementation (e.g. Cohen-Shacham et al. 2019; IUCN 2020) and highlighting the importance of rapid decarbonisation of the fossil fuel economy, as well as the risks associated with viewing NCS as a way to 'offset' fossil fuel emissions (Girardin et al. 2021), it is not clear that such claims are sufficient to counter the risk of co-option. There are no easy answers to resisting co-option and it could be a fruitful avenue for further research. Yet, centering governance questions by continually reflecting on which actors are leveraging NCS

for what purposes, and how, will be a key element of resistance efforts. Situating NCS, and other modes of climate mitigation, among the wide range of societal issues to be addressed and developing a much more accurately framed, bounded and politically contextualised discussion of NCS will help put NCS in perspective with respect to other modes of addressing climate and societal challenges (Woroniecki et al. 2020). An NCS discourse that is more nuanced and reflective of contemporary political and social realities is less likely to be co-opted.

**Concluding remarks**

The degree to which Natural Climate Solutions will deliver on their intended objectives of addressing climate-change, biodiversity and human flourishing will be shaped critically by their governance. In this review, I have argued that the growth of interest in NCS has emerged against a backdrop of an increasingly narrow focus on carbon within climate debates and a re-invigoration of crisis narratives. Such a discourse marginalises other concerns including regarding, for example, inequality, political polarisation and authoritarianism (Neimark et al. 2019). This is reflected in the focus of efforts to generate useful knowledge, which has tended to revolve around technical and ecological questions related to the potential contribution to climate mitigation at a global scale at the expense of questions around feasibility and desirability in particular places (Forster et al. 2020). Accordingly, the institutional frameworks that will ultimately shape the form and function of nature-based climate solutions are poorly articulated, raising concerns that the agenda will open up opportunities for more powerful actors to entrench their ability to control land and people.

These concerns are not unique to NCS. All efforts to mitigate climate change are deeply embedded in governance contexts with profound distributional impacts. In assessing the relative costs, benefits and contributions of NCS and other climate mitigation efforts, it is important to work with contextualised research that foregrounds considerations of access, burden-sharing and how to resist co-option. There are no simple prescriptions or solutions to achieving this, but adopting a more explicitly multi-scale and multi-disciplinary approach to NCS is important for avoiding pitfalls associated with caricatured contexts of where NCS strategies are deployed. Researchers and practitioners must reflect on the impact of their strategies for promoting NCS; for example, while there may be some way to go in refining estimates of the global mitigation potential of NCS, continuing to generate decontextualized global assessments may merely serve to perpetuate the marginalisation of important considerations of inequality and provide ammunition to actors seeking to perpetuate the status quo. This may mean re-orientating research away from global assessments to more ‘middle-range’ and local-level analyses that can adequately capture the dynamics of, for example, land tenure, decision-making, access, conflict and trade-offs at sufficiently fine resolution that the findings illuminate and inform, rather than obscure, the actual governance processes determining outcomes.

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Outlines International Union for the Conservation of nature (IUCN) (who are among the organisations that have spear-headed the proliferation of NbS discourse) principles for NbS and compares them with other dominant framings for ecosystem-based approaches to addressing societal and conservation concerns.

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