Leveraging Nature-based Solutions for transformation: Reconnecting people and nature

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Abstract
1. Nature-based Solutions (NbS) have rapidly been gaining traction across the research, policy and practice spheres, advocated as transformative actions to jointly address biodiversity loss and climate change. However, there are multiple, alternative ways to conceptualize NbS across those three spheres.

2. To inform the NbS discourses in research, policy and practice, we critically reflect on the prevailing framing of NbS. Although the concept links environmental health to human well-being, we argue that its current dominant framing reinforces a dichotomy between people and nature by highlighting one, external nature working for the benefit of society. For the NbS concept to support transformation, we believe it must embody a reframing of human–nature relationships towards regenerative relationships between humans and nature.

3. To support the transformative aspirations of NbS, we propose a novel core framing of NbS making explicit the co-dependence of people and nature, which underpins human well-being and environmental health. We highlight how such a framing can support a transformation through influencing beliefs and normative values, and second, through the communication and application of the NbS concept in research, policy and practice.

4. We then elaborate on how such a framing is key to support inclusivity and collaboration between diverse research perspectives, policy objectives across scales and implementation practices to deliver just and successful NbS.

Keywords
framing, human–nature dichotomy, Nature-based Solutions, relational thinking, relational values, transformation

1 | INTRODUCTION

Over the past 2 years, there has been a substantial amount of international support for Nature-based Solutions (NbS) from the UN Decade of Ecosystem Restoration to the World Economic Forum to the UK’s Green Recovery from COVID (DEFRA, 2020a; United Nations (UN), 2019; WEF, 2020). As a result, there is growing momentum for NbS in international climate and biodiversity policy.
spaces. For example, NbS are one of the five action tracks for the UNFCCC COP26 in the UK (DEFRA, 2020b) and were one of the key themes at the recent Climate Adaptation Summit in the Netherlands (Global Commission on Adaptation (GCA), 2020). The zero draft of the post-2020 global biodiversity framework also emphasizes the need for NbS to address climate change mitigation and adaptation (Convention on Biological Diversity (CBD), 2020b). The use of the term dates back to a 2008 World Bank report focusing on the climate change mitigation and adaptation co-benefits of biodiversity conservation (MacKinnon et al., 2008; see Seddon et al., 2021 for a full account of the origins and use of the concept). More recently, NbS has been defined by IUCN as ‘actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits’ (Cohen-Shacham et al., 2016). They encompass a broad range of actions, based on the ecosystem approach, which involve working with nature for societal benefits (Seddon et al., 2021). As clarified by Seddon et al. (2021), these actions can be broadly classified into four broad categories—protection, restoration, management and creation. This includes, for example, ecosystem-based adaptation (EbA), forest and landscape restoration (FLR), ecosystem-based disaster risk reduction (eco-DRR), agroforestry and locally managed marine areas (LMMAs). In the wake of its rapid uptake across policy and practice, IUCN released a global standard to operationalize the definition and guide the implementation and evaluation of NbS (IUCN, 2020). The standard includes 28 indicators organized around 8 core criteria to deliver benefits for biodiversity and people, with a focus on ensuring a fair and equitable distribution of benefits (IUCN, 2020). In complement, a consortium of research and conservation and development organizations have released four high-level guidelines providing overarching policy guardrails for successful and sustainable NbS (NBSI, 2020).

This growing momentum behind NbS has been driven in part by the recognition that current actions to address the climate crisis and environmental degradation are wholly insufficient to match the scope and scale of the challenge (Leclère et al., 2020; Seddon et al., 2020; Williams et al., 2020). It is telling that none of the Aichi biodiversity targets for 2020 set in 2010 by the Convention on Biological Diversity (CBD, 2020a). Thus, transformation is often mentioned alongside NbS and deemed necessary to shift from an unsustainable status quo to jointly address the underlying drivers of the climate and biodiversity crises (Ehrenfeld, 2004; IPBES, 2019; Steffen et al., 2018). COVID-19 has catalysed this awareness, with growing calls from social movements, such as Extinction Rebellion and Fridays for Future, to ensure that measures to rebuild economies embody the vital importance of our relationship with nature, reflecting a shift in attitudes to address these challenges holistically (Otto et al., 2020).

NbS are themselves proposed as mechanisms to achieve transformative change towards more resilient, sustainable landscapes for people and nature (Woroniecki, 2020). For example, criterion 8 of the IUCN standard emphasizes the need to learn from the implementation of NbS to ‘trigger transformative change’ (IUCN, 2020). However, for this to be realized, NbS must be framed as transformational. The framing of an issue is a key point of focus in transformations, as it influences how people understand the topic itself, shaping how problems and solutions are defined and addressed (Nisbet, 2009; Spence & Pidgeon, 2010). Thus, the way NbS is framed, which aspects of NbS are made salient in policies or documents, has critical implications for how research, policy and practice around NbS are interpreted (de Jesús Arce-Mojica et al., 2019; Entman, 1993; Hanson et al., 2020). Reflecting on how framings influence research and knowledge production is essential to produce research supporting transformative change (West et al., 2020; Woroniecki et al., 2020).

According to IPBES (2019), transformation represents ‘a fundamental, system-wide reorganization across technological, economic and social factors, including paradigms, goals and values’. The global societal challenges of climate crisis, biodiversity loss, and food and water security are rooted in, and exacerbated by, socio-economic structures which dichotomize humans from nature, making our existing system unsustainable, necessitating transformation (Abson et al., 2017; Castree, 2005; Folke et al., 2011; Plumwood, 1993). Although transformation requires change across scales, bottom-up to top-down, and across landscapes, the foundations of it lie in ‘changing relationships, cultural values and beliefs’, that is, ‘scaling-deep’ (Moore et al., 2014, 2015). In the context of transformation, values refer to the beliefs and moral principles held by people (i.e. normative values), rather than the descriptive valuation of benefits from ecosystems (Stålhammars, 2021). Changing norms, values and worldviews, in turn, underpins transformational changes in the system—rules and governance, including social structures and institutions (Abson et al., 2017; Lavorel et al., 2019; Loorbach et al., 2017; Otto et al., 2020). For example, gradual changes in individual opinions and cascading changes in state policy have ultimately culminated in transformational changes in federal legislation around issues such as women’s suffrage and same-sex marriage in the United States (Tribou & Collins, 2015). Therefore, it is argued that addressing our shared, global socio-environmental challenges also requires deep cultural and systemic shifts and resetting the dichotomous relationship with nature perpetuated by Western epistemologies (Castree, 2005; Nisbet, 2009; Schultz, 2002; Walsh et al., 2021). Simultaneously, it requires critically reflecting on how these challenges are understood and framed, including the biodiversity and climate crises, as this shapes the solutions to address them (Wyborn et al., 2020).

Following calls for greater reflexivity in environmental conservation (Montana et al., 2020), we critically reflect on how the NbS concept is being framed on the international stage, specifically around human–environment relations. Given the positioning of NbS as vehicles for transformative change (e.g. IUCN, 2020), we explore the implications that framings of NbS hold for such change. However, it is beyond the scope of this article to fully
explore the various ways in which NbS precipitate transformative change. We recognize that transformative change is nonlinear and multi-faceted, requiring disruptive changes across a variety of domains, and thus cannot rest on a single concept (Loorbach et al., 2017). However, crises such as COVID-19 create ripe opportunities for transformative change (Abson et al., 2017). Given that there has been a rapid uptake of the term in research, policy and practice, we believe it is precisely at this juncture that a critical reflection on NbS framing is needed. Because the term is salient to a broader range of non-specialist audiences (Cohen-Shacham et al., 2019), the concept has been harnessed by a variety of different actors across sectors, making it an important lever in international policy and corporate decision making (see Seddon et al., 2021 for an overview). Furthermore, the word ‘solution’ explicitly links it to people, although with ambiguity about solutions to what and for whom. Thus, the simple, accessible language underpinning the concept allows it to function as a boundary object in dialogues between diverse actors (Hanson et al., 2020). In other words, it facilitates the emergence of a shared base level of understanding, even across actors holding a range of different perspectives and priorities. In turn, this is crucial to foster dialogues, and ultimately cross-sectoral partnerships, to scale-up change (Wyborn, 2015).

However, as we expand on below, the concept is predominantly being framed through an instrumental ecosystem services (ES) lens which reinforces a human–nature dichotomy. We argue that if the concept is framed this way, as it presently is (Hanson et al., 2020), its potential to reconnect people and nature will inherently be limited. In turn, this will inhibit the paradigm shifts in our conceptualization of human–nature relations needed for transformative change. As authors, we have engaged with the NbS concept in research and policy spheres through both the social and natural sciences in Western universities. From this perspective, we propose an inclusive core framing of NbS as a foundation for a different perspective on NbS centred around the dynamic and pluralistic relationships between people and nature. This aligns with changing views in nature conservation towards nature and people, rather than nature for people, or nature for itself (Mace, 2014). We believe this is key to support transformative change by influencing peoples’ perspectives and attitudes and shaping the impacts of NbS communication in the public sphere. We then explain how this core frame opens novel, inclusive research and policy pathways and discuss implications for research, policy and practice.

2 | CURRENT FRAMING OF NbS: DOMINATED BY ECOSYSTEM SERVICES

The widely accepted IUCN definition of NbS is unique in its conceptual inclusion of people and nature to address a broad range of societal challenges, beyond climate crisis (Cohen-Shacham et al., 2016). This represents a major change in environmental policy to support sustainable development, driven by a growing evidence base within Western science highlighting biodiversity as an essential underpinning of ecosystem services and human well-being (Folke et al., 2016; Naeem et al., 2016; Seddon et al., 2016). Thus, the definition moves away from a human–nature dichotomy, a division rooted in Western worldviews and increasingly recognized as a barrier to sustainability (Castree, 2003). Although many non-Western cultures do not recognize a conceptual distinction between people and nature (West et al., 2020), instead understanding nature and human well-being as interconnected and co-constitutive (Kimmerer, 2013; Ruiz-Mallén & Corbera, 2013; Salmón, 2000), what is compelling about the NbS concept is its capacity to introduce this relationship to an international stage dominated by Western scientific worldviews.

Against this backdrop, NbS is emerging in research, policy and practice heavily influenced by the concept of ES to understand human–nature relationships (Hanson et al., 2020). As such, there is a close link between the NbS and ES concepts, ‘indicating a path dependency in [NbS] uptake and use’ (Hanson et al., 2020). For example, the recently instituted IUCN’s NbS Global Standard heralds NbS as a mechanism to ‘harness the services of ecosystems’ and ‘deploy nature in helping resolve major societal challenges’, and positions NbS as derived from ‘goods and services’ (IUCN, 2020). Here the overarching emphasis is on the instrumental aspects of natural capital and ecosystem services (Potschin et al., 2016). This is a conscious attempt to mould NbS around the instrumental values and technocratic perspectives which dominate corporate, government and international policy decision making (Bieling et al., 2020). Thus, we argue that the permeation of the NbS concept by this ES lens is driven by prevailing power structures which depend upon and reinforce such values in policy and decision making (Bekessy et al., 2018; Lele et al., 2013). We recognize that the ES concept has spurred policy interest on the benefits humans derive from nature, improved scientific understanding of the relationships between ecosystem processes and benefits to people (Costanza et al., 2017; Ricketts et al., 2008), and provided a structured approach to evaluate the impact of land or seascape management on certain aspects of human well-being (Haines-Young et al., 2012; Maes et al., 2012). Although the concept makes explicit the interdependency of human and environmental health, the way NbS is currently framed in research, policy and practice remains narrowly focused on understanding this relationship through an ES lens highlighting one, external ‘nature’ working for the benefit of ‘society’ (Mace, 2014; Woroniecki, 2020). Therefore, the dominant lens reinforces a dichotomy between people and nature (Buscher & Fletcher, 2020).

Here, we argue that there is a need to ensure the NbS concept and associated narratives do not reinforce a dichotomy between humans and nature, superseding those power structures which led to the initial conception of NbS. Such a dichotomy becomes itself a barrier to the transformative change aspired to in the IUCN standard (see Criterion B) in that it remains entrenched in dominant Western hegemonic worldviews, reinforcing the focus on technocratic approaches which dominate scientific and decision-making arenas. This stifles
creative and innovative solutions to societal challenges (Nightingale et al., 2020; Pereira et al., 2019). Here, our aim is not to propose another critique of an ES lens; the risks and benefits associated with it have already been well articulated (e.g. see Bekessy et al., 2018; Chan et al., 2012; Lele et al., 2013; Redford & Adams, 2009). On the contrary, we strive for a constructive and collaborative dialogue, highlighting the inherent limitations of such a framing to make the case for a core framing of NbS reconnecting people and nature to foster innovation in transformations for sustainability.

3 | THE CORE FRAME OF NbS

As NbS in its definition focuses on both human well-being and biodiversity benefits, we believe the concept, bolstered by the momentum surrounding NbS in this moment, has the potential to support a reframing of human–nature relations away from a human–nature dichotomy in Western thinking towards interconnected parts of a whole. Recently, scholars have called for a relational turn in sustainability science, shifting structures of thinking towards relations among things and beings, including humans (Walsh et al., 2021; West et al., 2020). We argue that NbS can aid in a relational transformation if the concept is framed in a way which is inclusive, collaborative, interconnected and diverse at its core. Thus, we propose the core frame as a conceptual model which makes explicit the intertwined relationship between people and nature while gathering a multitude of perspectives on NbS (Figure 1). Such a frame aims to bring together previously siloed research disciplines, policies and action-focused practices, highlighting how with diversity and plural understandings, a relational turn is possible. In contrast, the human–nature dichotomy fosters separation: for example, the dichotomy is reflected in the treatment of environmental issues and socio-cultural issues as distinct and separate, between the natural and social sciences, respectively, even though they are intertwined (Pooley et al., 2014). This hinders the development of the integrated, holistic solutions necessary to address socio-environmental challenges (Rice, 2013). Thus, this core frame, by focusing attention on the potential for interdisciplinarity and cross-sectoral collaborations within NbS, pushes back against the separation of humans and nature which permeates research, policy and practice.

To understand a core framing of NbS, which brings together the various elements of NbS, we turn to theories of hybridity and assemblage, which are theoretical attempts to deconstruct dichotomies and conceptualize humans’ places within ecosystems. Hybridity promotes a shift from dualistic thinking, humans as separate and superior to nature, to hybrid thinking, humans and nature as mutually coexistent ‘hybrids’ (Whatmore, 2002). In short, humans are not apart from nature, but a part of it, in hybrid relation. While recognizing there are differences between humans and nature, hybridity ‘decoupl[es] the subject/object binary such that the material and the social intertwine in a variety of ways’ (Whatmore, 2002). The core frame supports hybrid thinking by recognizing that human well-being (the social) and nature (the material) are intertwined, co-constitutive and collaborative. Framed this way, NbS creates space for a transformation of Western worldviews to one in which humans and non-human nature are interconnected and mutually dependent.

Taking hybridity one step further, in the core framing of NbS, humans are decentred, culturally diverse elements among a broader constituency of other living and non-living elements. This is the concept of an assemblage, a gathering of interconnected relations (Deleuze & Guattari, 1988; Latour, 2005; Tsing, 2015), of semi-independent parts of a whole (DeLanda, 2006). The core frame encompasses the assembled parts of NbS, focusing attention on the whole ecosystem with humans as a decentralised element. In an era of the climate crisis, this core framing allows Western worldviews to recognize the co-dependencies between humans and other living and non-living elements of the system. In turn, this makes salient the importance of functioning ecosystems for humans and other beings, ensuring the mutual survival of humans and other assemblage elements (Tsing, 2017).

If NbS are communicated via this interconnected, inclusive and collaborative core frame, we see the potential for NbS to support a shift in Western worldviews around human–nature relations in two ways. First, on the individual scale, how concepts are framed can influence people’s perspectives and attitudes (Bain et al., 2012; Corner et al., 2014; Spence & Pidgeon, 2010). Thus, with the core
frame consolidating transformational elements of NbS (i.e. the interconnections between humans and nature), individuals may be influenced to shift towards this way of thinking and operating in the world. Second, the way environmental messages are communicated has material effects on environmental outcomes via influence of the public, or policy, sphere (Pezzullo & Cox, 2017; West et al., 2020). We recognize that the choice of human–nature framing or environmental metaphor depends on which resonates best with the target audience, and thus we do not advocate for only one static frame (Elliott, 2020; Raymond et al., 2013). As mentioned, the core frame aims to be inclusive of other ways of understanding human–nature relationships. Our argument is that if a narrow instrumental ES frame continues to permeate and dominate those spheres as it does now, discourses and narratives will inadvertently lead to narrow problem framings which, in turn, constrain the panoply of solutions envisaged, thereby hindering the transformative potential of NbS in practice (Bellamy & Osaka, 2020). Thus, the framing of NbS in international and national policy discourses holds strong implications for achieving transformational impact at scale, commensurate with the scale of our global challenges.

4 | IMPLICATIONS FOR RESEARCH, POLICY AND PRACTICE

For the NbS concept to support a shift away from a human–nature dichotomy, we believe a holistic, interconnected and inclusive core framing is urgently needed to shape global discourses on NbS across research, policy and practice (Figure 1). In this section, we review the implications the core frame could have across these three spheres. The core frame would support narratives recognizing the intertwined fate of humans and nature (Figure 1), promoting an ethic of care to encourage environmental stewardship (Jax et al., 2018; West et al., 2020). In contrast, framing nature as solely a provider of commodities and services can obstruct a vision for a more harmonious relationship, crowding out non-instrumental values driving stewardship thus hindering pro-environment behaviour change (Bekessy et al., 2018; Raymond et al., 2013). Furthermore, a technocratic framing of NbS as mere ‘solutions’ or fixes to the environmental degradation driven by growth-based economies hinders transformative change in that it displaces the reality that these problems are fundamentally human, driven by norms and institutions which do not value nature. Such framings promote incremental attempts to adapt to untenable development pathways driven by power structures inherently resistant to change, rather than transitioning away from them (Folke et al., 2011; Moore et al., 2014; West et al., 2020). Although a shift towards focusing on nature and people dynamisms is taking place in conservation science (Mace, 2014), the overall policy narrative is still dominated by a ‘nature for humans’ perspective. In contrast to nature working for people, the core framing presented here postures that NbS should be understood as people and nature working together, collaboratively. This aligns with the notion of people working with nature (Seddon et al., 2020), and NbS as place-based partnerships between people and nature (Seddon et al., 2021). In turn, this can foster notions of caring, which have been identified as central forces for landscape stewardship (Jax et al., 2018). Ensuring that NbS discourses convey these messages is crucial to support the necessary reframing of human–nature relationships within Western worldviews.

4.1 | Research

Adopting the core frame would foster more integrated, interdisciplinary research on NbS, nested in a more holistic understanding of human–nature interactions (see Box 1, Figure 1). Identifying social–ecological interactions across scales is crucial to elucidate how natural resource management can support harmonious landscapes for people and nature. Fundamentally, what we construe as benefits, or services, are generated by complex, nonlinear and dynamic social–ecological interactions (Costanza et al., 2017; Folke et al., 2011), co-produced, or co-constituted, by people and nature (Bennett et al., 2015; Diaz et al., 2015; Lavorel et al., 2019; Palomo et al., 2016). Although we recognize the dependence of societies on the biosphere, what drives the effectiveness of a solution is fundamentally an outcome of social–ecological relations, rather than from natural capital alone. Yet, the ES concept is primarily applied through a lens characterizing the relationship between people and nature as simple and linear (Costanza et al., 2017). Although the literature on ES has acknowledged the co-production of services for some time (e.g. see Chan et al., 2012; Palomo et al., 2016; Raymond et al., 2018), such research remains scarce (Kadykalo et al., 2019). Furthermore, despite calls for fuller incorporation of social and cultural values in ES assessments and frameworks to do so (Chan et al., 2012), there is a paucity of research incorporating non-instrumental valuation (Kadykalo et al., 2019). The more recent concept of Nature’s contributions to people (NCP) attempts to address these shortfalls by accommodating relational values and the permeation of culture across categories of benefit (Díaz et al., 2015). Yet, in a recent systematic review of the literature on ES, Kadykalo et al. (2019) find that most studies on ES (94%) adopt a narrow instrumental frame of ES based on biophysical and economic approaches. As most research on NbS is conducted through such a lens, knowledge remains limited in (a) understanding how to shape NbS to the social and ecological context and (b) capturing the complex nature of social–ecological drivers and outcomes (see Box 1). More emphasis is needed in research on the interplay of the biophysical, ecological and social dimensions to improve our understanding of how benefits are co-produced with nature (Bennett et al., 2015). The core frame addresses those limitations by centering human well-being and biodiversity as both outcomes and drivers of NbS for resilient landscapes. Conversely, framing NbS solely through the dominant ES lenses emphasizes the biophysical or natural elements, as opposed to the social, even though the ‘solution’ represents an intervention defined by people and activated by people with nature. Therefore, adopting a holistic framing of NbS is crucial to understand how to design NbS and what
BOX 1 Applying the core frame in research on Nature-based Solutions

As an example of how the core framing can shape a field, we think through its application in the research sphere, recognizing interconnected research topics and the need for interdisciplinary collaborations. First, the core frame provides a focus on place and recognizes that NbS as interventions sit in social–ecological landscapes shaped by co-evolving, context-specific interactions between society and nature (Folke et al., 2004, 2005; Walker et al., 2004). This understanding is crucial to delivering sustainable benefits and managing trade-offs, as it allows fine-tuning NbS to social–ecological contexts (Seddon et al., 2020). For example, how NbS interact with local power relations, market forces, social structures, gender relations or the governance context mediates their outcome (Bhattarai, 2019; Oduor, 2020). Additionally, the right choice of species is heavily dependent on the biogeographical context and holds critical implications for promoting the resilience of NbS (Seddon et al., 2020).

The core frame brings focus to the social–ecological relations underpinning the emergence of benefits for people and nature. For example, people's interactions with nature influences their social capital, with beneficial impacts on livelihoods, and people's capacity to adapt to climate change (Valenzuela et al., 2020; Woroniecki, 2019). This outcome emerges from human–nature relations and is not solely derived from nature per se. However, the emphasis in NbS research is predominantly on tangible benefits (e.g. protection against climate hazards) (Chausson et al., 2020; Kadykalo et al., 2019). Yet, core motivations for engaging in NbS also include relational values, including intangible connections to nature which foster stewardship and care and drive positive human–nature interactions (Chan et al., 2018; European Commission (EC), 2020). For example, Tidball et al. (2018) show how through community-based reforestation, the act of coming together to plant trees strengthens social infrastructure and fosters sense of place, spurring virtuous cycles of civic engagement. Exploring these dynamics and emergent outcomes is essential to scale-up sustainable NbS.

As only a small proportion of the literature on ES currently embraces the social sciences and humanities (Kadykalo et al., 2019), most published research on nature-based interventions currently lacks an integrated focus considering broader social, economic and ecological outcomes (Chausson et al., 2020; de Jesús Arce-Mojica et al., 2019; Hanson et al., 2020). Furthermore, a narrow focus on biophysical, or economic outcomes of NbS ignores the plurality of benefits NbS can bring (Seddon et al., 2020). It also prioritizes the natural sciences and environmental economics, crowding other disciplines essential to understand human–nature interactions such as human–environment geography, ecological economics, environmental anthropology or the environmental humanities (Bennett et al., 2017). Furthermore, research on how NbS links to issues of social and environmental justice remains peripheral in the literature on NbS (Cousins, 2021; Woroniecki et al., 2020). Therefore, crucially important knowledge is left out hampering the design, implementation and governance of NbS.

Nesting NbS research in the core frame makes explicit the dynamic, co-evolving relationships of people and nature. This allows for a more comprehensive understanding of how NbS interfaces with the local context and what drives effectiveness. This can be achieved by incorporating relational approaches in research to generate more holistic analyses of human–nature connectedness (West et al., 2020). The core framing would also support and encourage more collaborative, interdisciplinary research, including research on how NbS build social capital and address issues of equity and justice, recognized as pillars of sustainable development (United Nations (UN), 2016).

underpins their effectiveness. Importantly, this framing should support more inclusive research frameworks, welcoming interdisciplinary approaches, while accommodating previous bodies of research to inform the science on NbS. This way, research on NbS may take different pathways which retain the potential to merge and reinforce each other.

4.2 | Policy

Adopting the core frame would support the integrated policymaking needed to respond to the biodiversity crisis and climate crisis (Figure 1). First, the framing of NbS in decision-making spaces matters as it directly influences the vision for desirable landscapes, shaping policy objectives and the actions that follow. For example, Chazdon (2020) calls for restoration thinking and the criteria and indicators guiding the practice to be framed around the core principles of restoring new relationships between people and nature. Although dominant framings of NbS already explicitly link nature to efforts to address climate change, we argue that a more holistic framing is necessary to shape policies and landscape planning for transformative change. More specifically, we call for one which recognizes the dynamic, systemic linkages between people and nature across landscapes, in contrast to the dominant linear frame which largely displaces the complex relationships between people and nature. Second, the core frame aligns with the social–ecological visions increasingly called for to set goals and targets bridging biodiversity, climate and sustainable development policy at international and national decision-making scales. This supports the integrative ambitions of the United Nations’ 2030 Agenda and the aspirations of the Convention on Biological Diversity’s post-2020 global biodiversity framework to link biodiversity and its contributions to people for
sustainable development (Reyers & Selig, 2020). National and international policy frameworks remain highly sectoralized into goals and targets separating people and nature, obscuring the relationship between biodiversity and people at the heart of sustainable development (Obura, 2020; Reyers & Selig, 2020). For example, conserving, restoring and managing functioning ecosystems are crucial to mitigate climate change and address a range of climate change impacts on people (Chaussonet al., 2020; Seddon et al., 2021). Lastly, despite an increasing emphasis on social and cultural values in ecosystem services assessments in some contexts (e.g. the EU initiative on mapping and assessment of ecosystems and their services; Maes et al., 2018), current decision-making contexts narrowly focus on short-term economic gains, crowding out the diversity of values ascribed to nature and its contributions to well-being (Pascual et al., 2017). In such contexts, shifting perspectives is necessary to foster transformative visions which underpin the necessary cascade of changes reconfiguring sectors and decision-making domains (Tábara et al., 2018; Wiek & Iwaniec, 2014). The core frame welcomes a plurality of perspectives in decision-making contexts while supporting the need for more integrated socio-cultural valuation approaches in NbS policy, beyond economic valuation, to achieve sustainability alongside economic efficiency (Costanza et al., 2017; Pascual et al., 2017).

4.3 | Practice

The core frame has the potential to influence NbS practice, building upon the place-based nature of NbS for the empowerment of local and Indigenous voices in shaping NbS on the ground. NbS are shaped by site-specific natural and cultural elements (Cohen-Shacham et al., 2016). In turn, how effective a particular intervention is depends upon its context and the perspectives of Indigenous peoples and local communities (Seddon et al., 2021). This interplay of the natural and socio-cultural dimensions where NbS take place evokes thinking around the biocultural paradigm: approaches which centre local knowledge, normative values, and needs and are reflexive of the interconnections between humans and nature (Sterling et al., 2017). According to Merçon et al. (2019), biocultural approaches hold transformative potential, as they focus on the ‘connections between cultural and biological diversity, human well-being, social justice, and the formulation of culturally pertinent policies’. With its transformational commitments, the core frame emanates this, emphasizing biological and socio-cultural connections by including local and Indigenous knowledges, many of which already reflect holistic understandings of human–nature relationships crucial to designing effective interventions (Kimmerer, 2013; Todd, 2016). This perspective on NbS also aligns with recent calls for the UN Decade on Ecosystem Restoration to adopt a social-ecological approach to restoration, to navigate the complex nature of social-ecological systems and to adaptively promote human well-being and ecosystem health (Fischer et al., 2020). Understanding restoration through a social-ecological lens allows recognizing that peoples’ interactions with nature and landscapes are deeply embedded in social relations and how people interpret their relationships with nature (Carr, 2020). These approaches to NbS practice, aligned with the commitments of the core frame, reject a human–nature dichotomy by recognizing that people and their environments form and change in conjunction with each other.

4.4 | Fostering collaborative and inclusive spaces in research, policy and practice on NbS

A more inclusive core frame is crucial to support more collaborative spaces harnessing the diversity in knowledges, worldviews and values necessary to foster socially just policies and practices, as well as creativity and innovation (Pereira et al., 2019; Scholz & Steiner, 2015; Tang, 2019). This is important because the way NbS is framed shapes whose knowledge matters in research, policy and practice. On the ground, prioritizing external perspectives and knowledge over local ones can constrain positive social outcomes like empowerment (Woroniecki et al., 2020), and jeopardize the effectiveness of interventions (Scheba & Mustalahlil, 2015). Interventions which foster local ownership and empowerment are also more likely to lead to positive ecological outcomes (Hajjar et al., 2020; Oldekop et al., 2016). A more inclusive frame can support transdisciplinary processes, allowing Western scientific disciplines to coexist with other knowledge systems, including local and Indigenous knowledge systems, which provide place-based insights into what actions work (Armitage et al., 2012; Artelle et al., 2018; Ruiz-Mallén & Corbera, 2013). Inclusive processes recognizing the legitimacy of local knowledges and perspectives are crucial to ensure that policies receive the buy-in of all implicated actors and that land-management decisions address local needs (Díaz et al., 2015; Van Kerkhoff & Lebel, 2015). This is crucial, as the trajectories of the landscapes in which NbS sit are shaped by the people who live and depend on these landscapes (Margules et al., 2020). Hence, inclusive, collaborative processes fostering knowledge co-production are necessary to drive the design and implementation of effective NbS that address the complex, cross-cutting nature of environmental change (Brink et al., 2018; Colloff et al., 2017). However, this requires addressing elements of power and politics that hinder equitable participation in knowledge co-production and decision making (Van Kerkhoff & Lebel, 2015). Without attending to power, the ability for diverse actors to participate fully in knowledge co-production and decision making can be restricted (Miller & Wyborn, 2020), resulting in the reproduction of unequal power relationships (Turnhout et al., 2020). While the extent to which a frame fosters equality and plurality depends on whether and how politics and power are acknowledged and addressed (Vincent et al., 2020), we see a core frame incorporating diverse knowledges and practices as a critical step in the process. NbS has the potential to support co-production and align policy and practice with a long-held understanding of human and non-human relationships, but only if its framing fosters such collaborative spaces.
CONCLUSION

A lot of ambitions are pinned on this ‘super year for nature’, to fundamentally shift away from nature’s destruction and towards regenerative paths supporting biodiversity and healthy, resilient landscapes. Yet, we remain in the confines of a global economy structurally dependent on destructive economic growth, where nature is perceived as external and hence exploitable, rather than intertwined with our fate (Hickel, 2020). In part, achieving this vision urgently requires a reframing of human–nature relationships, one where nature and people are not merely viewed as separate and independent, but as intertwined and co-dependent. If the NbS concept does not transcend the Western tendency to dichotomize humans and nature, its potential to support transformative change towards regenerative, healthy landscapes for people and nature will inherently be limited. The core frame presented here shifts the focus of NbS away from an instrumental ES lens, towards an inclusive, collaborative assemblage with human–nature connections at its centre. Framed this way, NbS can support transformative visions of more just and sustainable societie…
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