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Lost in Transition? Capturing the Impacts of Conservation and Development Interventions on Relational Values and Human Wellbeing in the Forested Tropics

# Exploring the relationship between plural values of nature, human well-being, and conservation and development intervention: Why it matters and how to do it?

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## Abstract

1. Globally, land and seascapes across the bioculturally diverse tropics are in transition. Impacted by the demands of distant consumers, the processes of global environmental change and numerous interventions seeking climate, conservation and development goals, these transitions have the potential to impact the relationships and plurality of values held between people and place.
2. This paper is a Synthesis of seven empirical studies within the Special Feature (SF): 'What is lost in transition? Capturing the impacts of conservation and development interventions on relational values and human wellbeing in the tropics'. Through two Open Forum workshops, and critical review, contributing authors explored emergent properties across the papers of the SF. Six core themes were identified and are subsumed within broad categories of: (i) the problem of reconciling scale and complexity, (ii) key challenges to be overcome for more plural understanding of social dimensions of landscape change and (iii) ways forward: the potential of an environmental justice framework, and a practical overview of methods available to do so.
3. The Synthesis interprets disparate fields and complex academic work on relational values, human well-being and de-colonial approaches in impact appraisal. It offers a practical and actionable catalogue of methods for plural valuation in the field, and reflects on their combinations, strengths and weaknesses.
4. The research contribution is policy relevant because it builds the case for why a more plural approach in intervention design and evaluation is essential for

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achieving more just and sustainable futures, and highlights some of the key actions points deemed necessary to achieve such a transition to conventional practice.

#### KEYWORDS

conservation, development, human dimensions, human well-being, impact evaluation, plural values, relational values, tropical forests

## 1 | INTRODUCTION

Worldwide, landscapes—and therefore our relationships with them—are undergoing dramatic transitions. Tropical fisheries and forest frontiers are a foci of these changes, which have profound implications for the plural values (i.e. the instrumental, relational and intrinsic) that connect people and nature (Barlow et al., 2018; Himes & Miuraca, 2018; IPBES, 2022; Martin et al., 2023; McClanahan et al., 2015; van Vliet et al., 2012). From Indonesian peat swamp forests (Turetsky et al., 2015), to the tropical forests of the Amazon (Fearnside, 2017; Schielein & Börner, 2018; Schleicher, Peres, et al., 2017), the coastal zones of Malaysia (Richards & Friess, 2016) to the fisheries of the Caribbean (Forster et al., 2017), ecosystem and landscape change is rapid and drastic.

The ultimate drivers of landscape transitions and environmental decline in the tropics are the demand for commodities in more affluent countries combined with the outsourcing of destructive components of production chains to areas with lower environmental regulations (Carmenta et al., 2023; Liu et al., 2013). Despite the dominance of distant drivers many interventions focus at the site-level in areas of high biological and cultural diversity (Carmenta et al., 2023). Interventions often seek climate, conservation or development goals aiming to mitigate climatic and ecological damages, restore past losses or deliver to human needs (Adams et al., 2004; Convention on Biological Diversity, 2022; Mansourian et al., 2017; Otero et al., 2020; Reed, Oldekop, et al., 2020). Climate, conservation and development intervention targets such as 30 by 30 indicate the intended doubling-up of such site-level efforts (Convention on Biological Diversity, 2022; Dinerstein et al., 2017; Waldron et al., 2020; Wilson, 2016).

Crucially, the processes of global environmental change and the interventions developed in response to it, present a combined potential to impact the various relationships held between people and place. These relationships contribute in multiple ways to diverse conceptions of human well-being, or living well. This diversity in the types of values derived from nature, and the way they are prioritized and salient to (equally diverse) conceptions of human well-being, is referred to as plural values. The various contributions of nature to human well-being are most apparent for Indigenous Peoples and local communities living closest to nature in landscapes now often threatened by external drivers of change and targeted by conservation and development interventions (Erbaugh & Oldekop, 2018; Reed, Oldekop, et al., 2020; Tauli-Corpuz et al., 2020).

Indigenous Peoples, and non-indigenous local communities throughout the biodiverse tropics tend to practice small-scale low-input swidden agriculture combined with fishing, forest extraction and sale of surplus to local markets (Brondizio et al., 2021; Lima et al., 2020; Maffi & Woodley, 2012; Reyes-García et al., 2022). Indigenous Peoples and local communities (IP&LCs) inhabit cultures, life-frames, values and management practices that have evolved over considerable timescales and have proven consonant with nature (Kenter & O'Connor, 2022; Maffi, 2018). It is now established that IP&LCs have demonstrably less impact on nature than capitalized and neoliberalized stakeholder groups (Dawson et al., 2021; Garnett et al., 2018; IPBES, 2019). Their values and knowledge systems are increasingly highlighted in both science and policy as critical for their contribution to environmental governance and climate resilience (Brondizio & Tourneau, 2016; Convention on Biological Diversity, 2022; Corrigan et al., 2018; Franks, 2021; IPBES, 2022; Reyes-García et al., 2022).

Indigenous Peoples and Local Communities are distinct groups (reflected in our use of the ampersand) and are often some of the most vulnerable and politically, economically and epistemically marginalized peoples (Garnett et al., 2018; Newton et al., 2020). Local communities include those of mixed descent, that emerged following the detribalization of native populations, and that draw heavily on indigenous lifeways (Adams et al., 2008). Despite their contribution to conservation, the salience of non-material and relational values in these contexts, and the growing threats that IP&LCs face it remains the case that interventions and impact assessments generally omit the non-material constituents of peoples' lives and relationships with place (Gould et al., 2015; McKinnon et al., 2016; Oldekop et al., 2020).

Efforts to improve impact evaluation to enable evidence-based interventions (called for by e.g. Baylis et al., 2016; Ferraro & Pattanayak, 2006; Schleicher et al., 2020; Sutherland et al., 2004) have tended to focus on the tangible, material and quantitative aspects. For example, measuring agricultural yields (Duru et al., 2015; Landis, 2017; Sukhdev, 2018) or ecological outcomes (e.g. hectares deforested, carbon emitted; e.g. Coad et al., 2015; Coetzee et al., 2014; Geldmann et al., 2018, 2019; Guizar-Coutiño et al., 2022). Although there is a growing recognition of human dimensions in environmental change and governance (de Lange et al., 2016; IPBES, 2022; Woodhouse et al., 2015), facilitated by the ecosystem services concept that highlighted the cultural services of nature, the emphasis has still primarily been on instrumental

services (Chan, Satterfield, et al., 2012). Even when human dimensions are considered, the focus remains on the tangible contributions of nature to material well-being (IPBES, 2022; McKinnon et al., 2016). Furthermore, ecosystem service and well-being impact assessments tend to be dominated by externally derived criteria that may not align with local priorities (Esteves et al., 2012; Klain et al., 2014; Sterling et al., 2020). Locally relevant, place-based notions of the plural values contributing to well-being have been largely overlooked (Coulthard et al., 2018; Dacks et al., 2019; McGregor, Camfield, et al., 2015; Nussbaum, 2007).

Expanding the often narrow framing of human well-being in conservation, climate and development impact evaluation could benefit both people and nature. Such extension must capture the plurality of values that people hold for place (and that contribute to place-based well-being) (Agarwala et al., 2014). A suite of approaches for doing so is available (Carmenta et al., 2022; Cundill et al., 2017; Forster et al., 2022; McKinnon et al., 2016; Rasmussen et al., 2018) yet has remained largely absent from routine impact evaluation (Pascual et al., 2023). The IPBES global values assessment provided important insights into approaches to capturing the diverse values of nature and called for their integration into decision-making and policymaking (IPBES, 2022). One area of particular attention is the relational values concept—a non-material, non-instrumental value that captures the relations people hold for nature, and reflect the people–people interactions enabled through embedment in nature (Chan et al., 2016, 2018; Pascual et al., 2023).

In addition, a considerable body of work highlights the important contribution of non-material values to well-being (e.g. McGregor, Coulthard, et al., 2015; Russell et al., 2013). These include for example, emotional connections to places, identities rooted in place, and cultural interactions enabled by place (Chan et al., 2016; Daniel et al., 2012; Fish et al., 2016; Inglis & Pascual, 2021). The predominant invisibility of relational and subjective dimensions in conventional impact assessment is problematic, as it obstructs a relevant, equitable and decolonial understanding of localized intervention impacts (Fischer, 2014). This invisibility is significant because metrics shape desired outcomes and 'what gets measured, gets managed' (Jacobs et al., 2018). The tendency to overlook non-material values hampers the integration of these well-being constituents, including relationships with and interpretations of nature, into project goals (Schleicher, Schaafsma, et al., 2017; Thiry et al., 2018).

Enhancing impact assessment is crucial because knowledge systems, values, and place-based relationships are marginalized and disappearing. Without recognizing these values, climate, conservation and development efforts may inadvertently contribute to this attrition (Carmenta et al., 2023). Moreover, interventions cannot support community recovery from environmental harms, including risk and disaster, without reflecting locally held values (Carmenta et al, forthcoming). Lastly, the omission of relational values hinders a comprehensive understanding of the values inherent in the institutions of IP&LCs. Yet, these institutions provide evidence-based sustainable alternatives to more neoliberal forms of governance that emphasize instrumental values and ultimately segregate people and nature in

favour of extraction and protection (Adams et al., 2004; Brondizio et al., 2021; Otero et al., 2020).

The urgency of redefining what gets measured when assessing the social impacts of landscape transitions, be they incurred through global environmental change or interventions in response to it, is further signified by the growing calls for environmental justice (Coolsaet, 2020; Dawson et al., 2018; Martin et al., 2013). The concept of environmental justice seeks greater consideration of different worldviews and values in conservation (Diaz et al., 2015; IPBES, 2022; Obura et al., 2022; Pascual et al., 2021), and to decolonize conservation practice and science (Aini & West, 2018; Baker et al., 2019; Domínguez & Luoma, 2020; Kothari, 2021; Krauss, 2021; Lele et al., 2010; Mabele et al., 2023). What gets measured and how has important implications regarding whose voices are included in relevant policy fora and processes (e.g. Lundquist et al., 2015). Extending conventional impact evaluation to plural valuation processes has potential to inform equitable intervention strategies because it affords due recognition of the place-based plurality of values that are impacted through climate, conservation and development interventions (Jacobs et al., 2018; Pascual et al., 2021; Zafra-Calvo et al., 2020).

This Special Feature builds on this thinking and draws together contemporary research from climate, conservation and development fields. It represents an attempt to show how to operationalize complex ideas from a wide range of literature concerning relational values and decolonization into practical methods for impact evaluation and intervention design. It highlights why such efforts are important. Each contribution addresses the plural values of nature and represents a particular emphasis on the role of relational values of nature and the concept of well-being. Although the frameworks and methods are relevant globally, the collection is principally concerned with the contested frontier landscapes of the forested tropics—either in landscapes of land use change (e.g. forest conversion, subsistence agriculture to cash-crops) or in sites of interventions (e.g. protected areas, social forestry, sustainable use reserves). Whilst each of the papers addresses the concept of relational values, they do so in distinct ways—for instance, exploring the contribution of relational values to human well-being and the impacts of land use change, or interventions, on these contributions (Carmenta et al; Betley et al; Llopis et al, this issue); trade-offs related to well-being gains and losses (Carmenta et al. and Llopis et al, this issue); consequences and implications of value divergence between conservation practitioners and IP&LCs (Dawson et al; Yuliani et al; Betley et al, this issue); the role of values in intervention framing and subsequent motivational crowding (Lliso et al, this issue); and the expression and consideration of non-environmental relational values (Hoelle et al, this issue).

This Synthesis paper accompanies the collection and replaces the more standard Guest Editorial. Rather than present the papers alone, this Synthesis was collaboratively developed after all contributing authors had critically reviewed one-another's contributions and participated in 'Open Forum' workshops. Together, we explored emergent properties across the papers, catalogued the methods used for plural

valuation, and reflected on some of the research and practice implications that became evident in this process. Here, we discuss the six cross-cutting themes that emerged. Such insights are necessary for dialogue, transparency and to move towards social and environmental justice in the appraisal of global environmental change and design of associated interventions. The approaches used in this Special Feature demonstrate the possibility of new foundations to social impact assessment when considering climate, conservation and development interventions. Notably, they speak to expanding impact metrics towards a more grounded, relational and inclusive approach.

## 2 | METHODS

We held two 4-h virtual 'Open Forum' workshops, in September and October (2020). Workshop participants were co-authors of the seven papers in the Special Feature (n 23) (Figure 1), and three additional experts in the field. Participants were associated with various cultural and geographic backgrounds and represented a spectrum of disciplinary insights, spanning the natural and social sciences (e.g. anthropology, conservation social science, ecology, ecological economics, human geography, land systems science, political ecology and political economy) and were based in institutions around the world (including Brazil, EU, India, Indonesia, Mexico and the UK; Table S1). Prior to the workshops, all participants read drafts of all papers contributing to this Special Feature and were asked to highlight the challenges, advances, key messages and emergent concepts visible across them.

During the workshop, participants first shared their feedback in small break-out groups. These discussions were followed by an extended plenary session which applied the Open Forum method and followed Chatham House rules (Mindell, 2002). The Open Forum method generates discussion guided by metaphorical 'doors' which represent particular topics. Doors are considered 'entry points' through which participants can declare the intended theme associated with each of their interjections. The initial doors were defined by the Guest Editors (Carmenta and Zaeringher) and were based on a first reading of the individual manuscripts. Doors were different between the first (challenges, future and methods) and the second (justice, governance, participation and pathways to change) workshop. Each Open Forum session hosted an additional, untitled door, through which new concepts and themes could be introduced by the participants. The workshops were led by an independent facilitator and were recorded (through audio recording, and note keeping). A process of thematic consolidation of workshop recordings identified six core themes which organize the following sections.

## 3 | RESULTS AND DISCUSSION

We identified six emergent themes broadly characterized as those considering the cross-cutting methodological challenge of scale in relation to extending impact metrics in more plural appraisals (3.1), and those that identify key action points that would help address some of the barriers to mainstreaming plural valuation (3.2.1–3.2.4),

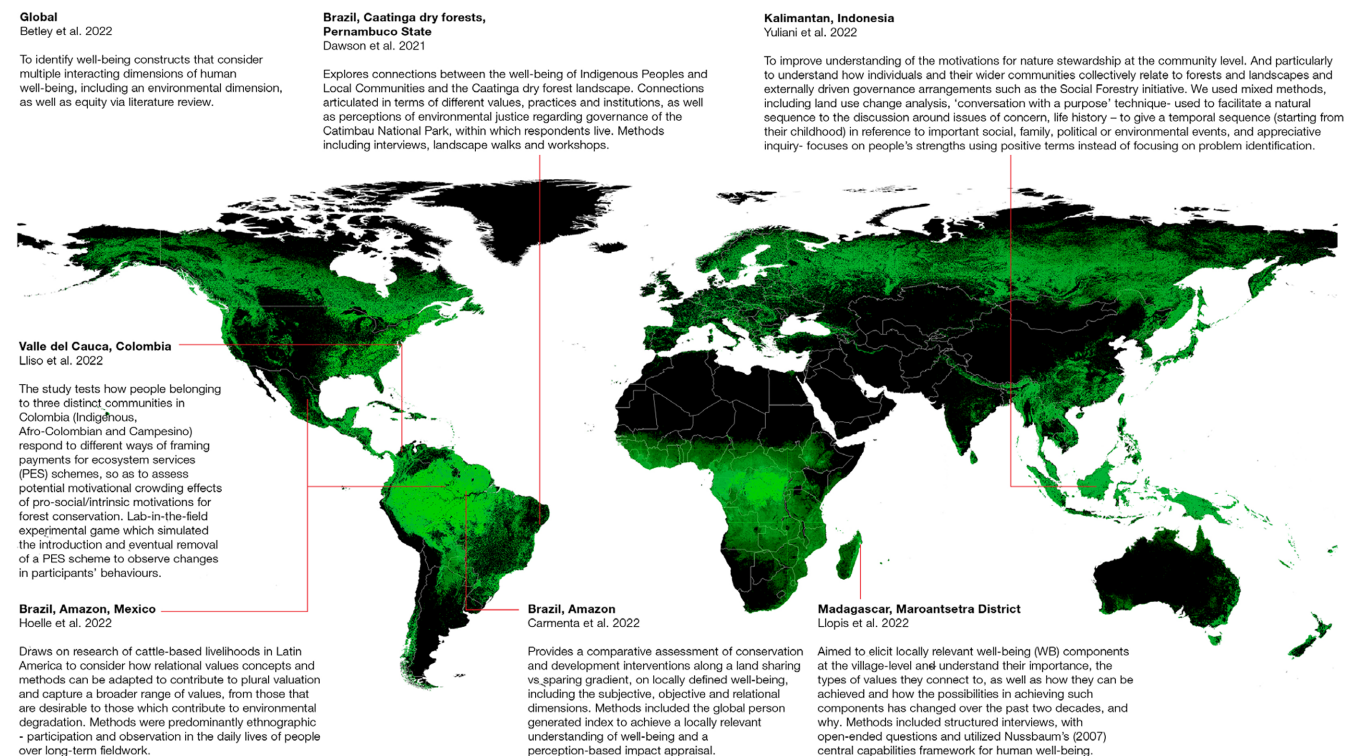


FIGURE 1 Geographic location, aims and methods applied for the seven empirical studies in the Special Feature.



and finally the promise of an environmental justice framework to encourage more just and plural approaches to climate, conservation and development intervention (3.3). We finish with an overview of the methods used (3.4) within the papers and that may be useful to researchers and practitioners keen to pursue plural valuation. Because our interest was in identifying *emergent* themes across the full collection of contributing papers within the Special Feature, it was not always possible to map each theme back to individual contributing papers. However, we indicate where specific references illustrate a particular point well, and combine the presentation of themes with consultation of the broader literature.

### 3.1 | Key methodological challenges: Identifying the sweet-spot

One of the six themes that emerged from the collection and workshops concerned a key methodological challenge and relates to the long-standing and lingering trade-off between nuance (e.g. context specificity) and scalability (or generalizability; Chan, Guerry, et al., 2012; Satz et al., 2013). Given that the methods and metrics used by researchers will inevitably condition the types of outcomes and conclusions that are both sought and reached (Jacobs et al., 2018; Termansen et al., 2022), finding a way to make visible the diverse values at stake and to reconcile different approaches to assessment is crucial. A key methodological challenge that researchers face concerns the difficult trade-offs in their attempts to locate the 'sweet-spot' between contrasting, and at times opposing, goals, methods and scales of analysis (White & Blackmore, 2016). As Betley et al (this issue) outline, one of the biggest challenges concerns finding the appropriate balance between translating the nuance and specificity of the lived experience of global change and its interventions in ways that can be understood by policymakers, and measured by indicators that are scalable and comparable. The degree to which this is possible, and where the most suitable 'sweet-spot' may lie is itself a pressing research question, and one not answered by the collection in this Special Feature. Emphasis on how local micro-processes scale-up, how macro-processes scale down, and how local social-ecological systems interact with each other, by focussing on interactions across scales, allows to navigate the tensions between nuance and scalability (Balvanera et al., 2017). Similarly, the scholarly debate on cultural ecosystem services has been reckoning with defining the appropriate scale of assessment for some time (Chan, Guerry, et al., 2012; Satz et al., 2013). This body of work has demonstrated the importance of eliciting values from a wide range of stakeholders in a particular place to fully conceptualize the relevant links between people and place critical to well-being (Klain et al., 2014) and proposed relevant protocols and frameworks for assessing these values (Breslow et al., 2016; Chan, Guerry, et al., 2012; Klain et al., 2014). These localized framings of well-being present challenges related to their comparability and how they can be integrated into broader scales for decision-making, planning and management (Chan, Guerry, et al., 2012; Turner et al., 2008).

A related issue, reiterated time and again across the papers, and the workshops, was that relying on the broad-brush of conventional, often standardized approaches, risks obfuscating place-based realities. This tendency is criticized for ignoring the hidden costs of global environmental change (and associated interventions) on non-material dimensions of well-being (e.g. farmer's psychological stress, lost rights; Büscher & Fletcher, 2019). Inattention to local life-frames, place attachments, identities, livelihoods, relationships and notions and aspirations of 'alternative' developments all pose considerable issues. At worst, this can mean failing to document harms incurred (e.g. when harms are in relational dimensions) (Carmenta et al, this issue), or failing to understand what people care about when introducing interventions and thereby impacting long-standing motivations (Lliso et al, this issue). On the contrary, attempts to explore the full nuance of place-based values and find metrics using bottom-up approaches can pose its own set of challenges, such as issues of broader comparability, theoretical, conceptual and disciplinary consistency, or relevance to decision-makers. An aversion to the 'fuzzy' variables that are intangible and difficult to measure in clearly bounded terms is persistent and problematic (see Section 3.2.1 below). It impairs justice in impact appraisal and propagates the dominance of material metrics in pursuit of 'development' (Pascual et al., 2023). Diving into the nuances of contrasting sites, and synthesizing insights beyond the need of shared methods and indicators, to identification of key principles can advance the recognition of relational values in impact assessments (Balvanera et al., 2017).

(In)commensurability was another key problem to confront. Concepts such as 'Total Economic Value' (OECD, 2006) or 'Inclusive Wealth' (Dasgupta, 2021) and Payments for Ecosystem Services are influential in policy circles due to their proposed ability to subsume multiple types of value within a single metric yet so far single metric approaches have tended to emphasize the instrumental values of nature over its non-instrumental contributions (O'Connor & Kenter, 2019). As such, they have received considerable criticism (e.g. Admiraal et al., 2013). For example, ignoring issues of incommensurability between different types of values, can lead to idealized yet over-simplified typologies of trade-offs (e.g. economy vs. environment), which obscure alternative combinations (e.g. economy vs. relational values; Isacs et al., 2022), or for their inadequacy in measuring the subtler ways in which people consider nature valuable, including its intrinsic and relational worth (Pascual et al., 2017).

The papers in this Special Feature overcome part of the issues introduced above, by focussing on what is salient locally in terms of value, well-being and the natural world in the context of change. By engaging local perspectives, they have avoided an emphasis on the instrumental values alone and highlight values that otherwise would have remained hidden. Thus, they offer rich insight into diverse relations between people and place, the role of relational values in human well-being and in motivations for engagement with conservation agencies (e.g. Yuliani et al; Lliso et al, this issue). Yet, none of them explore the additional step of extending their findings to different locations, or experiment with scaling the results, indeed the nuance of the

studies suggests doing so would not be appropriate. In some ways, the Global Person Generated Index (Carmenta et al., 2022, this issue) partly overcomes the problem of value incommensurability by relying on perception-based statements of weighted importance across value types. Yet, doing so encounters new conundrums associated with aggregating individually held values and well-being scores to the community level - an issue explored by Betley et al (this issue).

The growing recognition of the diverse ways in which nature is important to human well-being and the pace at which landscapes are in transition has led to calls for more plural approaches to valuation, as well as more critical reflection on the implications and limitations of using different methods (Jacobs et al., 2018; Reid & Rout, 2020). However an ever-expanding valuation toolkit poses challenges of its own, such as how to compare and integrate results from disciplinary traditions with different epistemological foundations and practices of legitimacy (Sandbrook et al., 2022), in addition to differences in the temporal and spatial scales under study. In the sections that follow, we identify some of the challenges that must be addressed in order to embed plurality in impact appraisal.

### 3.2 | Future pathways: Action points for researching and implementing plurality in appraisal

Here, we outline four (of the six) themes that we identified and that together broadly represent action points needed to overcome the central challenges to bringing plurality into practice in pursuit of more just and sustainable futures in landscapes of transition.

#### 3.2.1 | Engage plurality to disarm hegemony

The over-emphasis of material and instrumental values of nature in site-level interventions reflects the dominant social, institutional and ideological hegemony centred in the neoliberalism of industrialized societies. Neoliberalism maintains a social and moral order exclusively centred on individual consumerism disconnected from the community, and the rupture of relations with the State, the union, and communality (Gare, 2017). This hegemony feeds a *homo economicus* mentality, ignoring, invalidating and delegitimizing the non-material and among these, the relational values that contribute to determining human behaviour, decision-making and well-being. A promising leverage point to counter this hegemony is bringing visibility to the diversity of values and increasing the legitimacy of relational values (Abson et al., 2017; Díaz, Settele, Brondizio, Ngo, Agard, et al., 2019; Díaz, Settele, Brondizio, Ngo, Guèze, et al., 2019; IPBES, 2022). Such efforts could help guide interventions towards just, equitable and sustainable futures in land- and seascapes.

By drawing on the plurality of values and holistic life-frames of living with, from, in and as nature, conservation action could embed and reflect ethics of responsibility, reciprocity and care and trend towards more just and inclusive futures (Díaz, Settele, Brondizio, Ngo, Agard, et al., 2019; Díaz, Settele, Brondizio, Ngo,

Guèze, et al., 2019; IPBES, 2022; Kothari, 2021; Pascual et al., 2021; Zafra-Calvo et al., 2020). External interventions in tropical land- and seascapes therefore need to build on, strengthen, revitalize and empower those people-nature relationships that are plural and that tend to persist in those places so often the target of interventions (Carmenta et al., 2023). Such a focus would derail the further homogenization of diverse values, which we see in practice through intervention strategies (Adams et al., 2004; Otero et al., 2020) and biased impact metrics (McKinnon et al., 2016).

The contributions in this Special Feature highlight cases of contemporary biocultural diversity and emphasize the importance of the local knowledge, place-based human well-being (and associated values) and the worldviews of IP&LCs as the source of diverse ways of life (Maffi, 2018). These various ways of living and being in the world shelter the existing alternatives in the shadow of the prevailing models (Kothari et al., 2019), and are defiant against derogatory labels routinely ascribed to smallholders which include 'backward', 'informal' or 'irregular' (Leach et al., 2021). Biocultural frameworks in synergy with frameworks that capture multidimensional well-being and relational values may respond to the ethical imperative to recognize diverse ways of life and contribute to the participatory creation of alternative developments (Guibrinet et al., 2021; Merçon et al., 2019; Rozzi, 2013; Sterling et al., 2020).

#### 3.2.2 | Acknowledge path-dependencies

Climate, conservation and development interventions must be anchored in locally relevant theory of change models that are informed by an understanding of previous interventions and their impacts (including the perceived impacts) on local stakeholders (Forster et al., 2022). Taking into consideration the learning afforded by past interventions (e.g. how diverse expectations have been met or not in a given landscape), experience of past risk, or landscape change, is an essential prerequisite to designing new interventions in a way that resonates with local expectations, and that is informed by appropriate theory of change interpretations. For example, resistance to social forestry programs in Sulawesi came about owing to the distrust that was created when a government reforestation program resulted in land dispossession, rather than reflect local commitment to conservation goals (Yuliani et al., 2022, this issue). Lliso et al (this issue) show that understanding how interventions have been introduced and framed with particular values can have different legacy-effects in terms of motivational crowding. Other work has shown how snap-shot interpretations of causal dynamics can seriously misguide intervention strategies, by disconnecting places from their (often colonial) pasts and thereby misdiagnosing the drivers of environmental decline (Carmenta et al, forthcoming). Understanding the historic interplay between intervention, environment and well-being through a plural values approach can offer important lessons for designing interventions that can potentially help restore relationships between people and place.

### 3.2.3 | Ensure that future scenarios include diverse values and worldviews

We are unequivocally living through an environmental crisis, which appears symptomatic of a values crisis (Martin et al., 2022) and a crisis of meaning (Gilliand, 2021). One of the action points deemed essential across papers involved supporting a broader, societal values shift, through which future scenarios for people and planet may be more sustainable and more just. Climate, conservation, and development actors operate in landscapes where the plurality of values is strong and salient and therefore have the potential to support alternative visions of the future. They can do so by giving better recognition to plural values and thus increase the legitimacy of the plural values that link people, nature and well-being (Carmenta et al., 2023).

Multidimensional well-being and the relational values within it show great diversity, which manifests in various visions of future development and what constitutes appropriate environment development trade-offs. Some of these visions offer alternatives to the mainstream dogma and could be strengthened by making relational values explicit, visible and legitimate. Alternative development visions are often promoted by Indigenous and social movements and grassroots organizations (e.g., ICCA territories of life, Via Campesina; Kothari et al., 2019). The knowledge and customary institutions of IP&LCs have gained increasing prominence within international environmental agreements, with explicit recognition of their rights, as well as their roles in and contributions to effective and equitable environmental governance (Convention on Biological Diversity, 2022). However, conventional ideas of development and people nature relationships are still most represented in international conservation organizations (Otero et al., 2020) and national agendas (Reed, Oldekop, et al., 2020).

The international conservation community must do more to recognize customary institutions of IP&LCs as legitimate and effective forms of governance and push for shifts in values. For example, the implementation of conservation projects on the ground through international NGOs can override customary tenure regimes and involve widespread human rights violations and contravene the social standards that they have signed up to and claim to uphold (Boyd & Keene, 2021). Global agendas, such as the Agenda 2030 and the SDGs, have been largely interpreted as trajectories towards sustainability that are rooted in (green) growth and largely based on instrumental values. These views appear steeped in the dominant assumption that economic growth underscores what it means to 'live well'. To make future interventions more inclusive and fair, they must include local and regional perspectives, place-based values and solicit local visions of development (Martin et al., 2022; Pereira et al., 2018; Wyborn et al., 2020).

The potential of grounded alternative future visions is clear in the diversity of frameworks and movements that have inspired people to take action and generate practices towards transformation (e.g. Kothari et al., 2019), many of which emphasize relational values to support actions (IPBES, 2022). For example, the Earth Stewardship

of the Ecological Society of America (Power & Chapin, 2010), the de-growth movement (Kallis et al., 2018), and the well-being economy alliance (WE-All) (Costanza et al., 2018). In these scenarios, relational and non-instrumental values gain legitimacy and acknowledgement, indeed are regarded as imperative to the sustainability of people-nature relationships.

### 3.2.4 | Strengthen transdisciplinary research partnerships

To enable a transition towards more just futures in tropical land- and seascapes, the commitment of conservation science, practitioners and stewards, must be focussed on sowing seeds that reclaim, recover and revitalize connection to nature, through multiple values of nature, and the relations that are enabled through nature. Recognition of the relational values embedded in multidimensional well-being frameworks can help to strengthen the legitimacy of the links between diverse actors, their knowledge and their experiences with nature (Russell et al., 2013). Academia and scientists can thereby have critical input in supporting change, through the way they produce, recognize and incorporate knowledges and values (Cash et al., 2003; Chambers et al., 2021; Clark et al., 2016; Lubchenco & Rapley, 2020; Norström et al., 2020; Zurba et al., 2022). In this way, scientists can become transformative agents. This practice partly involves the recovery of the sense of community in the experience of the co-construction of knowledge. In science, individual practice and institutional function can be transformed through collaborative work strategies and collective leadership (Care et al., 2021). Jacobs et al. (2020) propose the metaphor of 'octupy', where the power of the scientist in academia is critically used to do good. This metaphor arises in line with the creation of community and the transition to an ecological civilization that allows community interactions, where communities increase favourable conditions for the life of other communities (Gare, 2017).

Moving towards a just and sustainable future requires a methodological transformation that accompanies these changes. Transdisciplinarity is shown as the practice that allows this integration (Hirsch Hadorn et al., 2006). However, the majority of scientific knowledge produced on nature-people relations in the tropics is still conceptualized and driven by global North research agendas. A shift towards more equitable research partnerships between academic institutions in the Global North and South, and the various non-academic stakeholders connected to the conservation and development issues at hand, is necessary to enable collaboration across plural knowledge systems and unpack the full potential of transdisciplinary research (Mabele et al., 2023). Additionally, interdisciplinary collaboration around questions of resource use valuation and well-being is often still stifled due to the difficulty of finding a common understanding between, for example economists, social scientists and those with a background in the natural sciences (Satterfield et al., 2013). Enabling a transdisciplinary shift will require a change

to research funder's strategies, which currently evaluate proposals according to criteria of scientific excellence and fast impact, while neglecting that inter- and transdisciplinary research needs more time, reflection, humility and resources (Reed, Ickowitz, et al., 2020; Roesch-McNally et al., 2020).

Meaningful partnerships with the local communities across the Global South, including resource managers, local authorities, local leaders (including Indigenous leaders), as well a local academic institutions (researchers and students) is most urgently needed to foster this transformation. Decolonizing research funding, to support the active participation of academic and non-academic participants from the Global South, decolonizing research agendas to truly embrace the needs of the local communities, decolonizing conceptual frameworks to transcend epistemic injustice and fully include the knowledges and worldviews at stake, and decolonizing capacity building to foster horizontal north-south, south-north and south-south collective learning, will all be required (Amano et al., 2023; Economou-Garcia, 2022; Mwampamba et al., 2022).

Advocates of plural valuation often point to the potential of deliberation and stakeholder engagement to act as the vehicles capable of bridging different types of values, knowledge's and worldviews (Kenter, 2016; Lliso et al., 2022; Zafra-Calvo et al., 2020). Carefully executed inter- and transdisciplinary research processes and knowledge co-production can lead to social learning, build understanding and trust, bring legitimacy to 'fringe' values, and facilitate conflict resolution (IPBES, 2022; Pascual et al., 2017; Schneider et al., 2019; Wyborn et al., 2019). But these community-engaged approaches also come with their own challenges, such as the increase in resources required (e.g. financial, coordination, technical, time and training) compared to more conventional disciplinary and rapid appraisal approaches. They can also create and necessitate levels of reflexivity and self-reflection that can be uncomfortable to members of the research team, as they require questioning particular power dynamics and knowledge-power assumptions. They often demand training across methods and theoretical approaches, the interdisciplinary nature of which is still not fully endorsed within tertiary learning curricula (Hajer et al., 2015; Kelemen et al., 2022). This tension may hinder or impose limits on the feasibility of more plural methods and approaches in certain contexts (Schneider et al., 2022).

### 3.3 | The promise of environmental justice

The sixth emergent theme from the Special Feature and workshops concerned environmental justice. Specifically, the promise of the environmental justice framework to illustrate the distribution of impacts and thereby help steer-away from the 'invisible' harms associated with environmental change and its interventions (Martin et al., 2013). Here, we outline how the three interrelated dimensions of environmental justice: recognition; procedure and distribution (Coolsaet, 2020; Schlosberg, 2004) can and have been useful to the studies in the Special Feature and beyond. The framework allows us to pay specific attention to the perspectives of IP&LCs, whose

values, practices and governance institutions so often diverge from the prevailing logics, ways of thinking and the values and strategies of external actors designing and implementing interventions (Hoekema, 2017; IPBES, 2022).

Recognition is a core strand of interest to environmental justice, and also one that plural valuation addresses centrally. Recognition injustice is driven by discursive power that shapes and reproduces discourses, knowledges, and hierarchies regarding the values of nature. These power dimensions influence all societal interactions including actors' capacities to pursue their interests and values. As discussed above, climate, conservation and development interventions in the tropics have not fully *recognized* (accounted for or 'made visible') the different world views and values held by IP&LC in their conceptualization, design or evaluation (Balvanera et al., 2022; Guibrunet et al., 2021). Bringing visibility, or recognition to these plural values and views is necessarily addressed through an environmental justice framework. Due recognition then compliments the need to overcome hegemony (see Section 3.2.1), and can help counter the prevalence of material metrics and outcomes which continue to be a key strategy and focus of many interventions (Otero et al., 2020). A focus on the material metrics can undermine traditional knowledge, social relations or non-material values and result in rejection of the intervention (Yuliani et al, this issue; Blom et al., 2010). Further, without recognizing all value domains the trade-offs that interventions may introduce such as material gains at the cost of relational harms, can go un-noticed (e.g. Carmenta et al; Llopis et al, this issue).

The *procedural* dimension is also relevant, since better procedural justice would involve co-creation, and thus address the action point above calling for transdisciplinary engagement. Co-creation enables local preferences and priorities to inform development pathways, or strategies to meet climate and conservation goals and can help avoid introducing interventions misaligned with local values (e.g., Llopis et al, this issue). The replacement of local institutions and practices in the name of enhancing livelihoods and sustainability can result in perverse outcomes (e.g. reducing biocultural diversity and well-being) through disempowerment of local communities, and the lack of recognition of their longstanding cultural practices oriented towards sustainable use (Lele, 2013; Rai et al., 2019; Rode et al., 2015). Yuliani et al. (2022) (this issue) show how the adoption of market-based mechanisms and formal government sanctioned systems in Sulawesi have replaced traditional institutions and the cultural values of sacred forest and springs. Although participation of often marginalized communities in the procedures of interventions (e.g. the design and operationalization) is becoming more common, it is not always adequately achieved (i.e. in ways that capture the visions and needs of IP&LCs) and can be heavily influenced by power imbalances between proponents and residents (Dawson et al., Yuliani et al., this issue).

Procedural justice serves to counter the risk of reconfiguring decision-making structures away from local, customary institutions towards more formal and externally controlled processes (Fatem et al., 2018; Martin et al., 2013; Peluso & Lund, 2013). Evidence is emerging to support such change, including studies in this Special



**TABLE 1** Abbreviated methods and approaches used to understand, quantify and evaluate human well-being and relational values, as employed by studies featured in this Special Feature.

Method	Benefits/advantages
Global person generated index (GPGI), Semi-structured interview	Open-ended emic approach allows for local conceptions of well-being to find voice and be understood. The standardized structure of the instrument allows for some systematization of the data and subsequent analysis
Landscape walks and multi-stakeholder workshops, and semi-structured interview	Flexible to local values and priorities and so respondent-led, but some element of standardization of topic and quantification of more objective aspects of well-being
Participant–observation	Offers in-depth view in which understanding unfolds through normal events in daily life, rather than through deductive or structured methods that may foreclose on such understanding. Lends itself to description and depth of understanding, and specificity
Lab-in-the-field experimental game. Modified 'dictator game': the forest management game	Simulating complex real-world situations in a controlled experimental setting can provide key insights when designing policy by allowing researchers to isolate the effect of specific policy design choices
Structured interviews	<ol style="list-style-type: none"> <li>1. Data collected through this method are readily amenable for quantitative analysis.</li> <li>2. The flexibility the method provides for systematizing data collection in a qualitative, conversational manner while also leaving room for getting deeper into certain aspects relevant for the research questions.</li> </ol>
Focus group discussion and participatory workshops	<ol style="list-style-type: none"> <li>1. The method allowed for systematically eliciting as many locally relevant WB components as possible</li> <li>2. The method allows local participants and researchers to seek depth in questions and answers.</li> <li>3. Powerful method to 'quickly' get an idea of what is going on in the village, and can serve as an exploratory step to support further, deeper data collection steps.</li> <li>4. It can serve to generate rapport and trust between local populations and the research team at the start of working with a given community.</li> </ol>
Semi-structured interview, a 'conversation with a purpose' technique	The technique gathers a full picture of the interconnectedness among different elements of the issues being investigated. It also fosters a relaxed environment and trust, in which respondents can tell stories rather than answer structured questions
Appreciative Inquiry approach, focus group discussion, and semi-structured interview and	AI helps build the confidence of participants to express their opinion, and to come with more balanced perceptions than focusing too much on the negative
Life history technique and semi-structured interview	Useful to investigate what happened in the past and to establish time reference (combined with line calendar)
Land use/land cover analysis.	Useful to triangulate the qualitative information from respondents, and to get more quantitative information

Feature. For example: Yuliani et al. (2022) (this issue) describe the value of customary governance based on relational values over commodification and property rights regimes; Carmenta et al. (2022) (this issue) show that more integrated, participatory and deliberative interventions make relatively better (i.e. more) and salient (i.e. locally relevant) contributions to human well-being in the Brazilian Amazon than single sector top down approaches; and Dawson et al. (2021) (this issue) reveal how increased recognition for IP&LCS' knowledge and practices in the Caatinga dry forests of Brazil could unearth effective local conservation solutions and avoid damaging, persistent conflicts around protected areas.

Furthermore, interventions and land use change often generate *distributional* shifts in access to and use of ecosystem services, which can result in negative impacts and injustices (Carmenta et al,

and Llopis et al, this issue; Wieland et al., 2016). The distribution of benefits and burdens is central in understanding the justice dimension of global environmental change and its drivers. All too often the drivers of environmental harm create benefits to those actors that are detached from the harms induced by landscape change (Lapola et al., 2023). Thus at a broader level, environmental justice allows us to question the strong focus on changing actors' behaviour at the local, site-level, in much conservation intervention. Given the driver of environmental harm and climate change is disproportionately related to the actions of wealthy actors, there is a need for a radical, system level change in conservation and development practice (Díaz, Settele, Brondízio, Ngo, Agard, et al., 2019; Díaz, Settele, Brondízio, Ngo, Guèze, et al., 2019), as well as for deep reflection by science itself (Pascual et al., 2017). Such transformation requires

Drawbacks/disadvantages	Citation within special feature
There is a risk that constituents which are taken-for-granted will not be cited, while those that have been recently threatened or impacted will be given more prominence	Carmenta et al. (2022)
Difficult to cover the full range of topics relevant to the well-being of diverse Indigenous and local communities in depth, so justified focus required. Establishing trust critical to success of the method to ensure important, sensitive and controversial topics mentioned and perspectives expressed	Dawson et al. (2021)
Difficult to generalize or transfer, as the focus is on the depth of place-specific life and phenomena. Requires investment in learning language, and culture and long-term fieldwork. Sometimes considered "subjective" because of proximity to subjects and lack of control over conditions of research	Hoelle et al. (2022)
The game setting is hypothetical and the "external validity" of these types of approaches is limited	Lliso et al. (2022)
1. Significant time and effort are needed to carefully design the questions and test the interviews 2. Depending on the scope of the topic, interviews can be lengthy and result in respondent fatigue	Llopis et al. (2022)
1. Results might be affected by power dynamics emerging during group discussions, possibly resulting in bias 2. The method requires very careful and sensitive moderation. 3. If time-constrained, the research team might have difficulties gathering all people necessary to conduct the discussions in a timely manner.	Llopis et al. (2022)
Requires patience but also sensitivity and knowledge of respondents' culture. Interviewers should have the skill to rephrase and guide the conversation appropriately Requires extra time to document and analyse, and to gather complementary information from other sources Sometimes requires going back to the respondent to clarify answers Prior to conducting interviews, interviewers should equip themselves with background knowledge, to identify interesting information to be probed	Yuliani et al. (2022)
Using AI does not mean we avoid talking about problems completely. We initially discussed problems, and after we gained sufficient understanding, posed questions using AI	Yuliani et al. (2022)
Interviewers should have background knowledge of historical events in the area, including the terms	Yuliani et al. (2022)
Requires knowledge of local situations to ensure appropriate interpretation Requires technical skills to perform LULCC analysis	Yuliani et al. (2022)

endorsement of a counter-narrative that would reframe the rationale and strategies underpinning conservation and development towards empowerment of, and stewardship by IP&LCs based on their own values, institutions and practices (Artelle et al., 2019; Garnett et al., 2018; Walker et al., 2014).

Conservation and development research has an important role to play in guiding the kind of transformative change necessary to truly enhance environmental justice in practice. However, the need for fuller engagement with the dimensions of environmental justice described in this section also pervade the scientific knowledge generation that informs them (Dunlap & Sullivan, 2020; Hajer et al., 2015). These issues require overcoming to increase the pace of progress towards transdisciplinary co-production or local production of knowledge. For example, Betley et al. (this issue) detail biases

inherent in different approaches to human well-being, justice and the governance of social-ecological systems. Overcoming the bias in science through critical reflection could be described as the pursuit of cognitive, or epistemic, justice, aligned with movements to decolonise western science (Rodriguez, 2017). Although research is often used as a justification for interventions involving capacity building among local communities, there is a case for flipping this narrative to instead focus on building the capacity of western-trained scientists and external practitioners to reflect on their biases (Tengö et al., 2017). This includes ethical questions around consent and ownership, whether Indigenous Peoples and local communities are treated merely as research subjects or participants, as partners or collaborators, or recognized as knowledge holders with rights of data sovereignty (Carroll et al., 2020; Cormack & Kukutai, 2022).

### 3.4 | Tools and approaches: Practical ways to evaluate the social impacts of climate, conservation and development intervention and change in tropical landscapes

A great many tools are available for evaluating non-tangible and plural values in impact appraisal. The variety of interview approaches, instruments, indices and techniques captured in the contributions of the Special Feature are indicative of this range of methodological possibility (Table 1, Table S2). For example, several papers from this Special Feature (Dawson et al., 2021; Llopis et al., 2022; Yuliani et al., 2022) assess well-being, and the embedded relational values and goods that contribute to it through focus group discussions and participatory workshops. Meanwhile, Hoelle et al. (2022) draw from ethnographic methods and adopt participant observation, others adapted desk-based and secondary data analysis methods (Betley et al., 2021), whilst some integrated geospatial land use and land cover change analysis to triangulate qualitative data from participants (Yuliani et al., 2022).

In several instances, combinations of methods were developed and applied in the field. For example, Yuliani et al. (2022) used an appreciative inquiry technique with semi-structured interviews and focus groups. Dawson et al. used a sequential set of methods that engaged participants early on in defining what was important to their well-being and basing subsequent methods on those results; Llopis et al., 2022 used focus groups (developed in Llopis et al. (2020)) to inform subsequent structured interviews, and Carmenta et al. (2022), applied the Global Person Generated Index (GPGI) to solicit locally salient constituents of well-being and then employed focus groups to better understand perceptions of the causal pathways through which interventions were perceived to have created the impacts experienced. In some instances, data collected qualitatively was quantified upon analysis—for example Llopis et al.'s (2022) hierarchical cluster analysis to develop a typology of households based on the land uses. Other methods to assess subjective well-being and associated values included standardized approaches such as experimental behavioural economics and 'Mini-Q' surveys to identify human–nature relationships and how different value frames impact on the likely effectiveness of Payments for Ecosystem Services interventions (Lliso et al., 2022).

In contrast to routine metrics of well-being that tend to emphasize material constituents through predetermined indicators, all of the methods in the Special Feature focused on active engagement of the participants to articulate locally relevant and multi-dimensional constituents of well-being. The papers range from highly standardized to more open and unstructured approaches. Several studies (Carmenta et al., 2022; Llopis et al., 2022) combined standardized question delivery (i.e. asking the same series of questions to respondents) with open responses, thereby allowing respondents to articulate their values and their well-being in their own words and informed by their own subjectivities. Other approaches include soliciting aspirations of a good life in an unstructured way, and a posteriori organizing them into categories that capture the

different dimensions expressed (Hoelle et al., 2022). These open-ended approaches, allow for a high level of nuance in responses and can give rich insight, meanwhile utilizing a level of structure, which may include ranking or enable weighting responses (e.g. GPGI), which can be useful in generating patterns and analysis of the data. Such data can then be categorized using existing well-being and values frameworks, or well-being frameworks can be extended to explore connections between the plural values of nature within multi-dimensional well-being constituents (e.g. Carmenta et al., 2022).

The diversity, specifics and place-based nature of values and well-being dimensions across the material, subjective and relational domains was a cross-cutting challenge for assessment. Capturing this diversity can impede the ability to achieve depth on any one dimension. The complexity of well-being, and the contribution of relational values (or goods), might be better captured using open-ended techniques that solicit highly nuanced insights. Yet such approaches run the risk of missing important factors that are taken for granted (Abunge et al., 2013) and potentially add emphasis to well-being aspects that have been recently threatened and therefore at the forefront of respondents' minds (e.g. Carmenta et al., 2022). Furthermore, engaged discussion and extended interviews around well-being can fatigue participants while other methods (e.g. participant observation) may be more fluid and less taxing (Coulthard et al., 2015; White, 2014). Across all methods, developing culturally competent and sensitive data gatherers who take the time and invest the care to build trust with interviewees was considered fundamental.

Despite the breadth of methods represented in the Special Feature, many others exist. For example, arts-based methods (e.g. drama and theatre) and Indigenous methodologies (e.g. dialogues, talking circles) and theoretical frameworks such as feminist political ecology that dig deeper in to some of the power dynamics that can afflict research methodologies, and particularly when they are not applied with reflexivity, empathy and deep ethics (Koster et al., 2012).

Overall, operationalizing these methodologies can significantly contribute towards more just and sustainable decisions, by activating key leverage points to foster deep transformative changes. Recognizing and making visible the diverse values of nature, including relational values and explicitly incorporating them into decisions is a major step (Pascual et al., 2023). Yet, transforming the way science is undertaken and the way institutions regulate decisions, and further shifting dominant paradigms of what is desirable will take longer and likely deliver more profound shifts.

## 4 | SUMMARY

Longstanding challenges remain in how we study and address the diversity of human relations with nature, and the social and environmental impacts of policies and interventions. However, interdisciplinary research and collaborations between researchers and

communities have provided promising steps in the direction of finding a path forward. We synthesize across a suite of empirical studies that have addressed plural valuation of global environmental change, or explored the impacts of interventions associated with it. These approaches ground our understanding of what it means to be living with change and these insights are imperative in order to move towards justice in the design and implementation of climate, conservation and development intervention. We identify key methodological challenges that extending impact appraisal in a plural direction often entails and identify action areas that will be useful for carving a way forward. We outline the ways in which an environmental justice framework demonstrates promise for advancing the case for, and approach to plural valuation. Our hope is that this Special Feature, and its synthesis help to clarify the ways in which practitioners and researchers can carry forward the momentum towards plural valuation that was created by the IPBES values assessment, and move towards the progressive and pluralist social principles which accompany the ambitious global conservation targets for 2030.

### AUTHOR CONTRIBUTIONS

Rachel Carmenta and J. G. Zaehring conceived the approach, designed the methods and co-founded the Special Feature. All contributing authors participated in the investigation, analysis and interpretation of key findings. Rachel Carmenta drafted the initial version of the manuscript and all co-authors contributed to writing sections, and to revisions and edits of earlier drafts of the manuscript.

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### CONFLICT OF INTEREST STATEMENT

Rachel Carmenta, Patricia Balvanera and Karen Mustin are Associate Editors for People and Nature, but were not involved in the peer review and decision making process.

### DATA AVAILABILITY STATEMENT

This paper is a Synthesis that was derived from secondary data available through the provisions in the papers that constitute the Special Feature. Notes of the two Open Forum workshops can be made available on request to two Guest Editors of the SF: Rachel Carmenta and Julie Zaehring.

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### REFERENCES

- Abson, D. J., Fischer, J., Leventon, J., Newig, J., Schomerus, T., Vilsmaier, U., Wehrden, H. v., Abernethy, P., Ives, C. D., Jager, N. W., & Lang, D. J. (2017). Leverage points for sustainability transformation. *Ambio*, 46(1), 30–39. <https://doi.org/10.1007/s13280-016-0800-y>
- Abunge, C., Coulthard, S., & Daw, T. M. (2013). Connecting marine ecosystem services to human well-being: Insights from participatory well-being assessment in Kenya. *Ambio*, 42(8), 1010–1021. <https://doi.org/10.1007/s13280-013-0456-9>
- Adams, C., Murrieta, R. S. S., Neves, W., & Harris, M. (2008). *Amazon peasant societies in a changing environment*. Springer.
- Adams, W. M., William, M., Aveling, R., Brockington, D., Dickson, B., Elliott, J., Hutton, J., Roe, D., Vira, B., & Wolmer, W. (2004). Biodiversity conservation and the eradication of poverty. *Science*, 306(5699), 1146–1149. <https://doi.org/10.1126/science.1097920>
- Admiraal, J. F., Wossink, A., de Groot, W. T., & de Snoo, G. R. (2013). More than total economic value: How to combine economic valuation of biodiversity with ecological resilience. *Ecological Economics*, 89, 115–122. <https://doi.org/10.1016/j.ecolecon.2013.02.009>
- Agarwala, M., Atkinson, G., Fry, B. P., Homewood, K., Mourato, S., Rowcliffe, J. M., Wallace, G., & Milner-Gulland, E. J. (2014). Assessing the relationship between human well-being and ecosystem services: A review of frameworks. *Conservation and Society*, 12(4), 437–449.
- Aini, J., & West, P. (2018, June 24). *Communities matter: Decolonizing conservation management*. Plenary lecture. International Marine Conservation Congress.
- Amano, T., Ramírez-Castañeda, V., Berdejo-Espinola, V., Borokini, I., Chowdhury, S., Golivets, M., González-Trujillo, J. D., Montañó-Centellas, F., Paudel, K., White, R. L., & Verissimo, D. (2023). The manifold costs of being a non-native English speaker in science. *PLoS Biology*, 21(7), e3002184.
- Artelle, K. A., Zurba, M., Bhattacharyya, J., Chan, D. E., Brown, K., Housty, J., & Moola, F. (2019). Supporting resurgent indigenous-led governance: A nascent mechanism for just and effective conservation. *Biological Conservation*, 240, 108284. <https://doi.org/10.1016/j.biocon.2019.108284>
- Baker, K., Eichhorn, M. P., & Griffiths, M. (2019). Decolonizing field ecology. *Biotropica*, 51(3), 288–292. <https://doi.org/10.1111/btp.12663>
- Balvanera, P., Calderón-Contreras, R., Castro, A. J., Felipe-Lucia, M. R., Geijzendorffer, I. R., Jacobs, S., Martín-López, B., Arbieu, U., Speranza, C. I., Locatelli, B., Harguindeguy, N. P., Ruiz Mercado, I., Spierenburg, M. J., Vallet, A., Lynes, L., & Gillson, L. (2017). Interconnected place-based social-ecological research can inform global sustainability. *Current Opinion in Environmental Sustainability*, 29, 1–7.
- Balvanera, P., Pascual, U., Christie, M., Baptiste, B., Lliso, B., Monroy, A. S., Guibrunet, L., Anderson, C. B., Athayde, S., Barton, D. N., Chaplin-Kramer, R., Jacobs, S., Kelemen, E., Kumar, R., Lazos, E., Martin, A., Mwampamba, T. H., Nakangu, B., O'Farrell, P., ... González-Jiménez, D. (2022). Chapter 1: The role of the values of nature and valuation for addressing the biodiversity crisis and navigating towards more just and sustainable futures. In P. Balvanera, U. Pascual, C. Michael, B. Baptiste, & D. González-Jiménez (Eds.), *Methodological assessment report on the diverse values and valuation of nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (p. 39). IPBES Secretariat. <https://doi.org/10.5281/zenodo.6418971>
- Barlow, J., França, F., Gardner, T. A., Hicks, C. C., Lennox, G. D., Berenguer, E., Castello, L., Economo, E. P., Ferreira, J., Guénard, B., Leal, C. G., Isaac, V., Lees, A. C., Parr, C. L., Wilson, S. K., Young, P. J., & Graham, N. A. J. (2018). The future of hyperdiverse tropical ecosystems. *Nature*, 559(7715), 517–526. <https://doi.org/10.1038/s41586-018-0301-1>
- Baylis, K., Honey-Rosés, J., Börner, J., Corbera, E., Ezzine-de-Blas, D., Ferraro, P. J., Lapeyre, R., Persson, U. M., Pfaff, A., & Wunder, S. (2016). Mainstreaming impact evaluation in nature conservation. *Conservation Letters*, 9(1), 58–64. <https://doi.org/10.1111/conl.12180>
- Betley, E. C., Sigouin, A., Pascua, P., Cheng, S. H., MacDonald, K. I., Arengo, F., Aumeeruddy-Thomas, Y., Caillon, S., Isaac, M. E., Jupiter, S. D., Mawyer, A., Mejia, M., Moore, A. C., Renard, D.,

- Sébastien, L., Gazit, N., & Sterling, E. J. (2021). Assessing human well-being constructs with environmental and equity aspects: A review of the landscape. *People and Nature*. <https://doi.org/10.1002/pan3.10293>
- Blom, B., Sunderland, T., & Murdiyarso, D. (2010). Getting REDD to work locally: Lessons learned from integrated conservation and development projects. *Environmental Science & Policy*, 13(2), 164–172. <https://doi.org/10.1016/j.envsci.2010.01.002>
- Boyd, D. R., & Keene, S. (2021). *Policy Brief No. 1 Human rights-based approaches to conserving biodiversity: Equitable, effective and imperative*.
- Breslow, S. J., Sojka, B., Barnea, R., Basurto, X., Carothers, C., Charnley, S., Coulthard, S., Dolšák, N., Donatuto, J., & García-Quirano, C. (2016). Conceptualizing and operationalizing human wellbeing for ecosystem assessment and management. *Environmental Science & Policy*, 66, 250–259.
- Brondízio, E. S., Aumeeruddy-Thomas, Y., Bates, P., Carino, J., Fernández-Llamazares, A., Ferrari, M. F., Galvin, K., Reyes-García, V., McElwee, P., & Molnár, Z. (2021). Locally based, regionally manifested, and globally relevant: Indigenous and local knowledge, values, and practices for nature. *Annual Review of Environment and Resources*, 46, 481–509.
- Brondizio, E. S., & Tourneau, F.-M. L. (2016). Environmental governance for all. *Science*, 352(6291), 1272–1273. <https://doi.org/10.1126/science.aaf5122>
- Büscher, B., & Fletcher, R. (2019). Towards convivial conservation. *Conservation & Society*, 17(3), 283–296.
- Care, O., Bernstein, M. J., Chapman, M., Diaz Reviriego, I., Dressler, G., Felipe-Lucia, M. R., Friis, C., Graham, S., Hänke, H., Haider, L. J., Hernández-Morcillo, M., Hoffmann, H., Kernecker, M., Nicol, P., Piñeiro, C., Pitt, H., Schill, C., Seufert, V., Shu, K., ... Zaehring, J. G. (2021). Creating leadership collectives for sustainability transformations. *Sustainability Science*, 16, 703–708. <https://doi.org/10.1007/s11625-021-00909-y>
- Carmenta, R., Barlow, J., Bastos Lima, M. G., Berenguer, E., Choiruzzad, S., Estrada-Carmona, N., França, F., Kallis, G., Killick, E., Lees, A., Martin, A., Pascual, U., Pettorelli, N., Reed, J., Rodriguez, I., Steward, A. M., Sunderland, T., Vira, B., Zaehring, J. G., & Hicks, C. (2023). Connected conservation: Rethinking conservation for a telecoupled world. *Biological Conservation*, 282, 110047. <https://doi.org/10.1016/j.biocon.2023.110047>
- Carmenta, R., Steward, A., Albuquerque, A., Carneiro, R., Vira, B., & Estrada Carmona, N. (2022). The comparative performance of land sharing, land sparing type interventions on place-based human well-being. *People and Nature*. <https://doi.org/10.1002/pan3.10384>
- Carroll, S. R., Garba, I., Figueroa-Rodríguez, O. L., Holbrook, J., Lovett, R., Materechera, S., Parsons, M., Raseroka, K., Rodriguez-Lonebear, D., Rowe, R., Sara, R., Walker, J. D., Anderson, J., & Hudson, M. (2020). *The CARE principles for indigenous data governance*. <https://doi.org/10.5334/dsj-2020-043>
- Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., Jäger, J., & Mitchell, R. B. (2003). Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences of the United States of America*, 100(14), 8086–8091. <https://doi.org/10.1073/pnas.1231332100>
- Chambers, J. M., Wyborn, C., Ryan, M. E., Reid, R. S., Riechers, M., Serban, A., Bennett, N. J., Cvitanovic, C., Fernández-Giménez, M. E., Galvin, K. A., Goldstein, B. E., Klenk, N. L., Tengö, M., Brennan, R., Cockburn, J. J., Hill, R., Munera, C., Nel, J. L., Österblom, H., ... Pickering, T. (2021). Six modes of co-production for sustainability. *Nature Sustainability*, 4, 983–996. <https://doi.org/10.1038/s41893-021-00755-x>
- Chan, K. M. A., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., Gould, R., Hannahs, N., Jax, K., Klain, S., Luck, G. W., Martín-López, B., Muraca, B., Norton, B., Ott, K., Pascual, U., Satterfield, T., Tadaki, M., Taggart, J., & Turner, N. (2016). Opinion: Why protect nature? Rethinking values and the environment. *Proceedings of the National Academy of Sciences of the United States of America*, 113(6), 1462–1465. <https://doi.org/10.1073/pnas.1525002113>
- Chan, K. M. A., Gould, R. K., & Pascual, U. (2018). Editorial overview: Relational values: What are they, and what's the fuss about? *Current Opinion in Environmental Sustainability*, 35, A1–A7. <https://doi.org/10.1016/j.cosust.2018.11.003>
- Chan, K. M. A., Guerry, A. D., Balvanera, P., Klain, S., Satterfield, T., Basurto, X., Bostrom, A., Chuenpagdee, R., Gould, R., Halpern, B. S., Hannahs, N., Levine, J., Norton, B., Ruckelshaus, M., Russell, R., Tam, J., & Woodside, U. (2012). Where are cultural and social in ecosystem services? A framework for constructive engagement. *BioScience*, 62(8), 744–756. <https://doi.org/10.1525/bio.2012.62.8.7>
- Chan, K. M. A., Satterfield, T., & Goldstein, J. (2012). Rethinking ecosystem services to better address and navigate cultural values. *Ecological Economics*, 74, 8–18. <https://doi.org/10.1016/j.ecolecon.2011.11.011>
- Clark, W. C., van Kerkhoff, L., Lebel, L., & Gallopin, G. C. (2016). Crafting usable knowledge for sustainable development. *Proceedings of the National Academy of Sciences of the United States of America*, 113(17), 4570–4578. <https://doi.org/10.1073/pnas.1601266113>
- Coad, L., Leverington, F., Knights, K., Geldmann, J., Eassom, A., Kapos, V., Kingston, N., de Lima, M., Zamora, C., Cuadros, I., Nolte, C., Burgess, N. D., & Hockings, M. (2015). Measuring impact of protected area management interventions: Current and future use of the global database of protected area management effectiveness. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 370(1681), 20140281. <https://doi.org/10.1098/rstb.2014.0281>
- Coetzee, B. W. T., Gaston, K. J., & Chown, S. L. (2014). Local scale comparisons of biodiversity as a test for global protected area ecological performance: A meta-analysis. *PLoS One*, 9(8), e105824. <https://doi.org/10.1371/journal.pone.0105824>
- Convention on Biological Diversity. (2022, December 7). *Agenda item 9A: The Kunming-Montreal Global biodiversity framework*. Conference of the Parties to the Convention on Biological Diversity Fifteenth Meeting Part II, Montreal, Canada, Montreal, Canada.
- Coolsaet, B. (Ed.). (2020). *Environmental justice: Key issues*. <https://www.routledge.com/Environmental-Justice-Key-Issues/Coolsaet/p/book/9780367139933>
- Cormack, D., & Kukutai, T. (2022). Indigenous peoples, data, and the coloniality of surveillance. In *New perspectives in critical data studies: The ambivalences of data power* (pp. 121–141). Springer International Publishing Cham.
- Corrigan, C., Bingham, H., Shi, Y., Lewis, E., Chauvenet, A., & Kingston, N. (2018). Quantifying the contribution to biodiversity conservation of protected areas governed by indigenous peoples and local communities. *Biological Conservation*, 227, 403–412. <https://doi.org/10.1016/j.biocon.2018.09.007>
- Costanza, R., Caniglia, E., Fioramonti, L., Kubiszewski, I., Lewis, H., Lovins, H., McGlade, J., Mortensen, L. F., Philipsen, D., & Pickett, K. (2018). Toward a sustainable wellbeing economy. *The Solutions Journal*, 9(2), 5.
- Coulthard, S., McGregor, J. A., & White, C. (2018). Multiple dimensions of wellbeing in practice. In K. Schreckenberg, G. Mace, & M. Poudyal (Eds.), *Ecosystem services and poverty alleviation: Trade-offs and governance* (pp. 243–257). Earthscan from Routledge.
- Coulthard, S., Paranamana, N., Sandaruwan, L., Manimohan, R., Maya, R., Amarasinghe, O., Koralgama, D., Britton, E., Bene, J., & McGregor, A. (2015). *Exploring wellbeing in fishing communities (South Asia)*. Methods Handbook, Online Open Access. [https://www.researchgate.net/profile/sarah\\_coulthard](https://www.researchgate.net/profile/sarah_coulthard)
- Cundill, G., Bezerra, J. C., De Vos, A., & Ntingana, N. (2017). Beyond benefit sharing: Place attachment and the importance of access to

- protected areas for surrounding communities. *Ecosystem Services*, 28, 140–148. <https://doi.org/10.1016/j.ecoser.2017.03.011>
- Dacks, R., Tickton, T., Mawyer, A., Caillon, S., Claudet, J., Fabre, P., Jupiter, S. D., McCarter, J., Mejia, M., Pascua, P., Sterling, E., & Wongbusarakum, S. (2019). Developing biocultural indicators for resource management. *Conservation Science and Practice*, 1(6), e38. <https://doi.org/10.1111/csp2.38>
- Daniel, T. C., Muhar, A., Arnberger, A., Aznar, O., Boyd, J. W., Chan, K. M. A., Costanza, R., Elmquist, T., Flint, C. G., Gobster, P. H., Grêt-Regamey, A., Lave, R., Muhar, S., Penker, M., Ribe, R. G., Schauppenlehner, T., Sikor, T., Soloviy, I., Spierenburg, M., ... von der Dunk, A. (2012). Contributions of cultural services to the ecosystem services agenda. *Proceedings of the National Academy of Sciences of the United States of America*, 109(23), 8812–8819. <https://doi.org/10.1073/pnas.1114773109>
- Dasgupta, P. (2021). *The economics of biodiversity: The Dasgupta review: full report* (Updated: 18 February 2021). HM Treasury.
- Dawson, N., Carvalho, W. D., Bezerra, J. S., Todeschini, F., Tabarelli, M., & Mustin, K. (2021). Protected areas and the neglected contribution of Indigenous Peoples and local communities: Struggles for environmental justice in the Caatinga dry forest. *People and Nature*. <https://doi.org/10.1002/pan3.10288>
- Dawson, N., Martin, A., & Danielsen, F. (2018). Assessing equity in protected area governance: Approaches to promote just and effective conservation. *Conservation Letters*, 11(2), e12388. <https://doi.org/10.1111/conl.12388>
- de Lange, E., Woodhouse, E., & Milner-Gulland, E. J. (2016). Approaches used to evaluate the social impacts of protected areas. *Conservation Letters*, 9(5), 327–333. <https://doi.org/10.1111/conl.12233>
- Diaz, S., Demissew, S., Carabias, J., Joly, C., Lonsdale, M., Ash, N., Larigauderie, A., Adhikari, J. R., Arico, S., Baldi, A., Bartuska, A., Baste, I. A., Bilgin, A., Brondizio, E., Chan, K. M., Figueroa, V. E., Duraipapp, A., Fischer, M., Hill, R., ... Zlatanova, D. (2015). The IPBES conceptual framework—Connecting nature and people. *Current Opinion in Environmental Sustainability*, 14, 1–16. <https://doi.org/10.1016/j.cosust.2014.11.002>
- Díaz, S., Settele, J., Brondizio, E., Ngo, H. T., Guèze, M., Agard, J., Arneth, A., Balvanera, P., Brauman, K., Watson, R. T., Baste, I. A., Larigauderie, A., Leadley, P., Pascual, U., Baptiste, B., Demissew, S., Dziba, L., Erpul, G., Fazel, A., ... Vilà, B. (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (p. 44). Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.
- Díaz, S., Settele, J., Brondizio, E. S., Ngo, H. T., Agard, J., Arneth, A., Balvanera, P., Brauman, K. A., Butchart, S. H. M., & Chan, K. M. A. (2019). Pervasive human-driven decline of life on earth points to the need for transformative change. *Science*, 366(6471), eaax3100.
- Dinerstein, E., Olson, D., Joshi, A., Vynne, C., Burgess, N. D., Wikramanayake, E., Hahn, N., Palminteri, S., Hedao, P., Noss, R., Hansen, M., Locke, H., Ellis, E. C., Jones, B., Barber, C. V., Hayes, R., Kormos, C., Martin, V., Crist, E., ... Saleem, M. (2017). An ecoregion-based approach to protecting half the terrestrial realm. *Bioscience*, 67(6), 534–545. <https://doi.org/10.1093/biosci/bix014>
- Domínguez, L., & Luoma, C. (2020). Decolonising conservation policy: How colonial land and conservation ideologies persist and perpetuate indigenous injustices at the expense of the environment. *Land*, 9(3), Article 3. <https://doi.org/10.3390/land9030065>
- Dunlap, A., & Sullivan, S. (2020). A faultline in neoliberal environmental governance scholarship? Or, why accumulation-by-alienation matters. *Environment and Planning E: Nature and Space*, 3(2), 552–579. <https://doi.org/10.1177/2514848619874691>
- Duru, M., Therond, O., Martin, G., Martin-Clouaire, R., Magne, M.-A., Justes, E., Journet, E.-P., Aubertot, J.-N., Savary, S., Bergez, J.-E., & Sarthou, J. P. (2015). How to implement biodiversity-based agriculture to enhance ecosystem services: A review. *Agronomy for Sustainable Development*, 35(4), 1259–1281. <https://doi.org/10.1007/s13593-015-0306-1>
- Economou-Garcia, A. (2022). *The North 'Helicoptering' into the South: A meta-analysis of parachute science in ecological field studies*.
- Erbaugh, J. T., & Oldekop, J. A. (2018). Forest landscape restoration for livelihoods and well-being. *Current Opinion in Environmental Sustainability*, 32, 76–83. <https://doi.org/10.1016/j.cosust.2018.05.007>
- Esteves, A. M., Franks, D., & Vanclay, F. (2012). Social impact assessment: The state of the art. *Impact Assessment and Project Appraisal*, 30(1), 34–42. <https://doi.org/10.1080/14615517.2012.660356>
- Fatem, S. M., Awang, S. A., Pudyatmoko, S., Sahide, M. A. K., Pratama, A. A., & Maryudi, A. (2018). Camouflaging economic development agendas with forest conservation narratives: A strategy of lower governments for gaining authority in the re-centralising Indonesia. *Land Use Policy*, 78, 699–710. <https://doi.org/10.1016/j.landusepol.2018.07.018>
- Fearnside, P. (2017, September 26). *Deforestation of the Brazilian Amazon*. Oxford Research Encyclopedia of Environmental Science. <https://doi.org/10.1093/acrefore/9780199389414.013.102>
- Ferraro, P. J., & Pattanayak, S. K. (2006). Money for nothing? A call for empirical evaluation of biodiversity conservation investments. *PLoS Biology*, 4(4), e105. <https://doi.org/10.1371/journal.pbio.0040105>
- Fischer, E. F. (2014). Introduction: The good life: Values, markets, and wellbeing. In *The good life: Aspiration, dignity, and the anthropology of wellbeing* (pp. 1–23). Stanford University Press.
- Fish, R., Church, A., & Winter, M. (2016). Conceptualising cultural ecosystem services: A novel framework for research and critical engagement. *Ecosystem Services*, 21, 208–217. <https://doi.org/10.1016/j.ecoser.2016.09.002>
- Forster, J., Shelton, C., White, C. S., Dupeyron, A., & Mizinova, A. (2022). Prioritising well-being and resilience to 'build back better': Insights from a Dominican small-scale fishing community. *Disasters*, 46(S1), S51–S77. <https://doi.org/10.1111/disa.12541>
- Forster, J., Turner, R. A., Fitzsimmons, C., Peterson, A. M., Mahon, R., & Stead, S. M. (2017). Evidence of a common understanding of proximate and distal drivers of reef health. *Marine Policy*, 84, 263–272. <https://doi.org/10.1016/j.marpol.2017.07.017>
- Franks, P. (2021). *Global biodiversity framework: Equitable governance is key*. IIED. <https://www.iied.org/20386iied>
- Gare, A. (2017). From 'sustainable development' to 'ecological civilization': Winning the war for survival. *Cosmos and History: The Journal of Natural and Social Philosophy*, 13(3), Article 3.
- Garnett, S. T., Burgess, N. D., Fa, J. E., Fernández-Llamazares, Á., Molnár, Z., Robinson, C. J., Watson, J. E. M., Zander, K. K., Austin, B., Brondizio, E. S., Collier, N. F., Duncan, T., Ellis, E., Geyle, H., Jackson, M. V., Jonas, H., Malmer, P., McGowan, B., Sivongxay, A., & Leiper, I. (2018). A spatial overview of the global importance of Indigenous lands for conservation. *Nature Sustainability*, 1(7), Article 7. <https://doi.org/10.1038/s41893-018-0100-6>
- Geldmann, J., Coad, L., Barnes, M. D., Craigie, I. D., Woodley, S., Balmford, A., Brooks, T. M., Hockings, M., Knights, K., Mascia, M. B., McRae, L., & Burgess, N. D. (2018). A global analysis of management capacity and ecological outcomes in terrestrial protected areas. *Conservation Letters*, 11(3), e12434. <https://doi.org/10.1111/conl.12434>
- Geldmann, J., Manica, A., Burgess, N. D., Coad, L., & Balmford, A. (2019). A global-level assessment of the effectiveness of protected areas at resisting anthropogenic pressures. *Proceedings of the National Academy of Sciences of the United States of America*, 116(46), 23209–23215. <https://doi.org/10.1073/pnas.1908221116>
- Gilliand, C. (2021). Experiencing values in the flow of events: A phenomenological approach to relational values. *Environmental Values*, 30(6), 715–736.
- Gould, R. K., Klain, S. C., Ardoin, N. M., Satterfield, T., Woodside, U., Hannahs, N., Daily, G. C., & Chan, K. M. (2015). A protocol for eliciting nonmaterial values through a cultural ecosystem services



- frame. *Conservation Biology*, 29(2), 575–586. <https://doi.org/10.1111/cobi.12407>
- Guibrunet, L., Gerritsen, P. R. W., Sierra-Huelsz, J. A., Flores-Díaz, A. C., García-Frapolli, E., García-Serrano, E., Pascual, U., & Balvanera, P. (2021). Beyond participation: How to achieve the recognition of local communities' value-systems in conservation? Some insights from Mexico. *People and Nature*, 3(3), 528–541. <https://doi.org/10.1002/pan3.10203>
- Guizar-Coutiño, A., Jones, J. P. G., Balmford, A., Carmenta, R., & Coomes, D. A. (2022). A global evaluation of the effectiveness of voluntary REDD+ projects at reducing deforestation and degradation in the moist tropics. *Conservation Biology*, 36(6), e13970. <https://doi.org/10.1111/cobi.13970>
- Hajer, M., Nilsson, M., Raworth, K., Bakker, P., Berkhout, F., De Boer, Y., Rockström, J., Ludwig, K., & Kok, M. (2015). Beyond cockpit-ism: Four insights to enhance the transformative potential of the sustainable development goals. *Sustainability*, 7(2), Article 2. <https://doi.org/10.3390/su7021651>
- Himes, A., & Muraca, B. (2018). Relational values: The key to pluralistic valuation of ecosystem services. *Current Opinion in Environmental Sustainability*, 35, 1–7. <https://doi.org/10.1016/j.cosust.2018.09.005>
- Hirsch Hadorn, G., Bradley, D., Pohl, C., Rist, S., & Wiesmann, U. (2006). Implications of transdisciplinarity for sustainability research. *Ecological Economics*, 60(1), 119–128. <https://doi.org/10.1016/j.ecolecon.2005.12.002>
- Hoekema, A. (2017). The conundrum of cross-cultural understanding in the practice of law. *The Journal of Legal Pluralism and Unofficial Law*, 49(1), 67–84. <https://doi.org/10.1080/07329113.2017.1310446>
- Hoelle, J., Gould, R. K., & Tauro, A. (2022). Beyond 'desirable' values: Expanding relational values research to reflect the diversity of human–nature relationships. *People and Nature*. <https://doi.org/10.1002/pan3.10316>
- Inglis, D., & Pascual, U. (2021). On the links between nature's values and language. *People and Nature*, 5(2), 326–342. <https://doi.org/10.1002/pan3.10205>
- IPBES. (2019). *Global assessment on biodiversity and ecosystem services*. IPBES Secretariat. <https://www.ipbes.net/global-assessment-report-biodiversity-ecosystem-services>
- IPBES. (2022). *Methodological assessment report on the diverse values and valuation of nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. (P. Balvanera, U. Pascual, M. Christie, B. Baptiste, & D. González-Jiménez, Eds.; p. 784). IPBES Secretariat. <https://doi.org/10.5281/zenodo.6522522>
- Isacs, L., Kenter, J. O., Wetterstrand, H., & Katzeff, C. (2022). What does value pluralism mean in practice? An empirical demonstration from a deliberative valuation. *People and Nature*, 5(2), 384–402. <https://doi.org/10.1002/pan3.10324>
- Jacobs, S., Martín-López, B., Barton, D. N., Dunford, R., Harrison, P. A., Kelemen, E., Saarikoski, H., Termansen, M., García-Llorente, M., Gómez-Baggethun, E., Kopperoinen, L., Luque, S., Palomo, I., Priess, J. A., Rusch, G. M., Tenerelli, P., Turkelboom, F., Demeyer, R., Hauck, J., ... Smith, R. (2018). The means determine the end—Pursuing integrated valuation in practice. *Ecosystem Services*, 29, 515–528. <https://doi.org/10.1016/j.ecoser.2017.07.011>
- Jacobs, S., Zafra-Calvo, N., Gonzalez-Jimenez, D., Guibrunet, L., Benessaiah, K., Berghöfer, A., Chaves-Chaparro, J., Díaz, S., Gomez-Baggethun, E., Lele, S., Martín-López, B., Masterson, V. A., Merçon, J., Moersberger, H., Muraca, B., Norström, A., O'Farrell, P., Ordonez, J. C., Prieur-Richard, A.-H., ... Balvanera, P. (2020). Use your power for good: Plural valuation of nature—The Oaxaca statement. *Global Sustainability*, 3, e8. <https://doi.org/10.1017/sus.2020.2>
- Kallis, G., Kostakis, V., Lange, S., Muraca, B., Paulson, S., & Schmelzer, M. (2018). Research on degrowth. *Annual Review of Environment and Resources*, 43(1), 291–316. <https://doi.org/10.1146/annurev-envir-on-102017-025941>
- Kelemen, E., Subramanian, S., Nakangu, B., Islar, M., Kosmus, M., Nuesiri, E., Porter-Bolland, L., De Vos, A., Amaruzaman, S., Yiu, E., & Arroyo-Robles, G. (2022). Chapter 6: Policy options and capacity development to operationalize the inclusion of diverse values of nature in decision-making. In P. Balvanera, U. Pascual, M. Christie, B. Baptiste, & D. González-Jiménez (Eds.), *Methodological assessment report on the diverse values and valuation of nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (pp. 1–146). IPBES Secretariat. <https://doi.org/10.5281/zenodo.6522359>
- Kenter, J. O. (2016). Editorial: Shared, plural and cultural values. *Ecosystem Services*, 21, 175–183. <https://doi.org/10.1016/j.ecoser.2016.10.010>
- Kenter, J. O., & O'Connor, S. (2022). The life framework of values and living as nature; towards a full recognition of holistic and relational ontologies. *Sustainability Science*, 17(6), 2529–2542. <https://doi.org/10.1007/s11625-022-01159-2>
- Klain, S. C., Satterfield, T. A., & Chan, K. M. A. (2014). What matters and why? Ecosystem services and their bundled qualities. *Ecological Economics*, 107, 310–320. <https://doi.org/10.1016/j.ecolecon.2014.09.003>
- Koster, R., Baccar, K., & Lemelin, R. H. (2012). Moving from research ON, to research WITH and FOR indigenous communities: A critical reflection on community-based participatory research. *The Canadian Geographer/Le Géographe Canadien*, 56(2), 195–210.
- Kothari, A. (2021). Half-earth or whole-earth? Green or transformative recovery? Where are the voices from the global south? *Oryx*, 55(2), 161–162. <https://doi.org/10.1017/S0030605321000120>
- Kothari, A., Salleh, A., Escobar, A., Demaria, F., & Acosta, A. (2019). *Pluriverse: A post-development dictionary* (Tulika books). Columbia University Press.
- Krauss, J. E. (2021). Decolonizing, conviviality and convivial conservation: Towards a convivial SDG 15, life on land? *Journal of Political Ecology*, 28(1), Article 1. <https://eprints.whiterose.ac.uk/180708/>
- Landis, D. A. (2017). Designing agricultural landscapes for biodiversity-based ecosystem services. *Basic and Applied Ecology*, 18, 1–12. <https://doi.org/10.1016/j.baae.2016.07.005>
- Lapola, D. M., Pinho, P., Barlow, J., Aragão, L. E. O. C., Berenguer, E., Carmenta, R., Liddy, H. M., Seixas, H., Silva, C. V. J., Silva-Junior, C. H. L., Alencar, A. A. C., Anderson, L. O., Armenteras, D., Brovkin, V., Calders, K., Chambers, J., Chini, L., Costa, M. H., Faria, B. L., ... Walker, W. S. (2023). The drivers and impacts of Amazon forest degradation. *Science*, 379(6630), eabp8622.
- Leach, M., MacGregor, H., Scoones, I., & Wilkinson, A. (2021). Post-pandemic transformations: How and why COVID-19 requires us to rethink development. *World Development*, 138, 105233. <https://doi.org/10.1016/j.worlddev.2020.105233>
- Lele, S. (2013). Environmentalisms, justices and the limits of ecosystem services frameworks. In *The justices and injustices of ecosystem services*. Routledge.
- Lele, S., Wilshusen, P., Brockington, D., Seidler, R., & Bawa, K. (2010). Beyond exclusion: Alternative approaches to biodiversity conservation in the developing tropics. *Current Opinion in Environmental Sustainability*, 2(1), 94–100. <https://doi.org/10.1016/j.cosust.2010.03.006>
- Lima, M., Vale, J. C. E. d., Costa, G. d. M., Santos, R. C. d., Correia Filho, W. L. F., Gois, G., Oliveira-Junior, J. F. d., Teodoro, P. E., Rossi, F. S., & da Silva Junior, C. A. (2020). The forests in the indigenous lands in Brazil in peril. *Land Use Policy*, 90, 104258. <https://doi.org/10.1016/j.landusepol.2019.104258>
- Liu, J., Hull, V., Batistella, M., DeFries, R., Dietz, T., Fu, F., Hertel, T. W., Izaurre, R. C., Lambin, E. F., & Li, S. (2013). Framing sustainability in a Telecoupled world. *Ecology and Society*, 18(2), 26. <https://doi.org/10.5751/ES-05873-180226>



- Lliso, B., Arias-Arévalo, P., Maca-Millán, S., Engel, S., & Pascual, U. (2022). Motivational crowding effects in payments for ecosystem services: Exploring the role of instrumental and relational values. *People and Nature*, 4(2), 312–329. <https://doi.org/10.1002/pan3.10280>
- Llopis, J. C., Diebold, C. L., Schneider, F., Harimalala, P. C., Andriamihaja, O. R., Messerli, P., & Zaehring, J. G. (2022). Mixed impacts of protected areas and a cash crop boom on human well-being in North-Eastern Madagascar. *People and Nature*. <https://doi.org/10.1002/pan3.10377>
- Llopis, J. C., Diebold, C. L., Schneider, F., Harimalala, P. C., Patrick, L., Messerli, P., & Zaehring, J. G. (2020). Capabilities under telecoupling: Human well-being between cash crops and protected areas in north-eastern Madagascar. *Frontiers in Sustainable Food Systems*, 3, 126. <https://doi.org/10.3389/fsufs.2019.00126>
- Lubchenco, J., & Rapley, C. (2020). Our moment of truth: The social contract realized? *Environmental Research Letters*, 15(11), 110201. <https://doi.org/10.1088/1748-9326/abba9c>
- Lundquist, C. J., Báldi, A., Dieterich, M., Gracey, K., Kovacs, E. K., Schleicher, J., Skorin, T., Sterling, E., & Jonsson, B.-G. (2015). Engaging the conservation community in the IPBES process. *Conservation Biology*, 29(6), 1493–1495.
- Mabele, M. B., Kasongi, N., Nnko, H., Mwanjoka, I., Kiwango, W. A., & Makupa, E. (2023). Inequalities in the production and dissemination of biodiversity conservation knowledge on Tanzania: A 50-year bibliometric analysis. *Biological Conservation*, 279, 109910. <https://doi.org/10.1016/j.biocon.2023.109910>
- Maffi, L. (2018). Sustaining biocultural diversity. In K. L. Rehg, & L. Campbell (Eds.), *The Oxford handbook of endangered languages* (pp. 683–700). Oxford Handbooks. <https://doi.org/10.1093/oxfordhb/9780190610029.013.32>
- Maffi, L., & Woodley, E. (2012). *Biocultural diversity conservation: A global sourcebook*. Routledge.
- Mansourian, S., Dudley, N., & Vallauri, D. (2017). Forest landscape restoration: Progress in the last decade and remaining challenges. *Ecological Restoration*, 35(4), 281–288. <https://doi.org/10.3368/er.35.4.281>
- Martin, A., McGuire, S., & Sullivan, S. (2013). Global environmental justice and biodiversity conservation. *The Geographical Journal*, 179(2), 122–131. <https://doi.org/10.1111/geoj.12018>
- Martin, A., O'Farrell, P., Kumar, R., Eser, U., Faith, D. P., Gomez-Baggethun, E., Harmackova, Z., Horcea-Milcu, A. I., Merçon, J., Quaas, M., Rode, J., Rozzi, R., Sitas, N., Yoshida, Y., Ochieng, T. N., Koessler, A. K., Lutti, N., Mannetti, L., & Arroyo-Robles, G. (2022). Chapter 5: The role of diverse values of nature in visioning and transforming towards just and sustainable futures. In M. Christie, P. Balvanera, U. Pascual, B. Baptiste, & D. González-Jiménez (Eds.), *Methodological assessment report on the diverse values and valuation of nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (pp. 1–126). IPBES Secretariat. <https://doi.org/10.5281/zenodo.6522326>
- Martin, D. A., Llopis, J. C., Raveloaritiana, E., Coomes, O. T., Andriamihaja, O. R., Bruun, T. B., Heinemann, A., Mertz, O., Rakotonarivo, O. S., & Zaehring, J. G. (2023). Drivers and consequences of archetypical shifting cultivation transitions. *People and Nature*, 5(2), 529–541. <https://doi.org/10.1002/pan3.10435>
- McClanahan, T., Allison, E. H., & Cinner, J. E. (2015). Managing fisheries for human and food security. *Fish and Fisheries*, 16(1), 78–103. <https://doi.org/10.1111/faf.12045>
- McGregor, A., Camfield, L., & Coulthard, S. (2015). Competing interpretations: Human wellbeing and the use of quantitative and qualitative methods. In K. Roelen & L. Camfield (Eds.), *Mixed methods research in poverty and vulnerability: Sharing ideas and learning lessons* (pp. 231–260). Palgrave Macmillan. [https://doi.org/10.1057/9781137452511\\_10](https://doi.org/10.1057/9781137452511_10)
- McGregor, A., Coulthard, S., & Camfield, L. (2015). *Measuring what matters: The role of well-being methods in development policy and practice* [report]. Overseas Development Institute. <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9688.pdf>
- McKinnon, M. C., Cheng, S. H., Dupre, S., Edmond, J., Garside, R., Glew, L., Holland, M. B., Levine, E., Masuda, Y. J., Miller, D. C., Oliveira, I., Revenaz, J., Roe, D., Shamer, S., Wilkie, D., Wongbusarakum, S., & Woodhouse, E. (2016). What are the effects of nature conservation on human well-being? A systematic map of empirical evidence from developing countries. *Environmental Evidence*, 5, 8. <https://doi.org/10.1186/s13750-016-0058-7>
- Merçon, J., Vetter, S., Tengö, M., Cocks, M., Balvanera, P., Rosell, J. A., & Ayala-Orozco, B. (2019). From local landscapes to international policy: Contributions of the biocultural paradigm to global sustainability. *Global Sustainability*, 2, e7.
- Mindell, A. (2002). *The deep democracy of open forums: Practical steps to conflict prevention and resolution for the family, workplace, and world*. Hampton Roads Publishing.
- Mwampamba, T. H., Egoh, B. N., Borokini, I., & Njabo, K. (2022). Challenges encountered when doing research back home: Perspectives from African conservation scientists in the diaspora. *Conservation Science and Practice*, 4(5), e564.
- Newton, P., Kinzer, A. T., Miller, D. C., Oldekop, J. A., & Agrawal, A. (2020). The number and spatial distribution of Forest-proximate people globally. *One Earth*, 3(3), 363–370. <https://doi.org/10.1016/j.oneear.2020.08.016>
- Norström, A. V., Cvitanovic, C., Löf, M. F., West, S., Wyborn, C., Balvanera, P., Bednarek, A. T., Bennett, E. M., Biggs, R., de Bremond, A., Campbell, B. M., Canadell, J. G., Carpenter, S. R., Folke, C., Fulton, E. A., Gaffney, O., Gelcich, S., Jouffray, J.-B., Leach, M., ... Österblom, H. (2020). Principles for knowledge co-production in sustainability research. *Nature Sustainability*, 3(3), Article 3. <https://doi.org/10.1038/s41893-019-0448-2>
- Nussbaum, M. (2007). Human rights and human capabilities. *Harvard Human Rights Journal*, 20, 21.
- Obura, D. O., DeClerck, F., Verburg, P. H., Gupta, J., Abrams, J. F., Bai, X., Bunn, S., Ebi, K. L., Gifford, L., & Gordon, C. (2022). Achieving a nature-and people-positive future. *One Earth*, 6, 105–117.
- O'Connor, S., & Kenter, J. O. (2019). Making intrinsic values work; integrating intrinsic values of the more-than-human world through the life framework of values. *Sustainability Science*, 14(5), 1247–1265. <https://doi.org/10.1007/s11625-019-00715-7>
- OECD. (2006). *Total economic value*. <https://www.oecd-ilibrary.org/content/component/9789264010055-7-en>
- Oldekop, J. A., Rasmussen, L. V., Agrawal, A., Bebbington, A. J., Meyfroidt, P., Bengston, D. N., Blackman, A., Brooks, S., Davidson-Hunt, I., Davies, P., Dinsi, S. C., Fontana, L. B., Gumucio, T., Kumar, C., Kumar, K., Moran, D., Mwampamba, T. H., Nasi, R., Nilsson, M., ... Wilson, S. J. (2020). Forest-linked livelihoods in a globalized world. *Nature Plants*, 6(12), Article 12. <https://doi.org/10.1038/s41477-020-00814-9>
- Otero, I., Farrell, K. N., Pueyo, S., Kallis, G., Kehoe, L., Haberl, H., Plutzer, C., Hobson, P., García-Márquez, J., Rodríguez-Labajos, B., Martin, J.-L., Erb, K.-H., Schindler, S., Nielsen, J., Skorin, T., Settele, J., Essl, F., Gómez-Baggethun, E., Brotons, L., ... Pe'er, G. (2020). Biodiversity policy beyond economic growth. *Conservation Letters*, 13(4), e12713. <https://doi.org/10.1111/conl.12713>
- Pascual, U., Adams, W. M., Díaz, S., Lele, S., Mace, G. M., & Turnhout, E. (2021). Biodiversity and the challenge of pluralism. *Nature Sustainability*, 4, 567–572. <https://doi.org/10.1038/s41893-021-00694-7>
- Pascual, U., Balvanera, P., Anderson, C. B., Chaplin-Kramer, R., Christie, M., González-Jiménez, D., Martin, A., Raymond, C. M., Termansen, M., Vatn, A., Athayde, S., Baptiste, B., Barton, D. N., Jacobs, S., Kelemen, E., Kumar, R., Lazos, E., Mwampamba, T. H., Nakangu, B., ... Zent, E. (2023). Diverse values of nature for sustainability. *Nature*, 620(7975), 813–823.
- Pascual, U., Balvanera, P., Díaz, S., Pataki, G., Roth, E., Stenseke, M., Watson, R. T., Başak Dessane, E., Islar, M., Kelemen, E., Maris, V.,

- Quaas, M., Subramanian, S. M., Wittmer, H., Adlan, A., Ahn, S., Al-Hafedh, Y. S., Amankwah, E., Asah, S. T., ... Yagi, N. (2017). Valuing nature's contributions to people: The IPBES approach. *Current Opinion in Environmental Sustainability*, 26–27(Supplement C), 7–16. <https://doi.org/10.1016/j.cosust.2016.12.006>
- Peluso, N. L., & Lund, C. (2013). *New frontiers of land control*. Routledge.
- Pereira, L., Hichert, T., Hamann, M., Preiser, R., & Biggs, R. (2018). Using futures methods to create transformative spaces: Visions of a good Anthropocene in southern Africa. *Ecology and Society*, 23(1). <https://doi.org/10.5751/ES-09907-230119>
- Power, M. E., & Chapin, F. S. (2010). Planetary stewardship in a changing world: Paths towards resilience and sustainability. *Bulletin of the Ecological Society of America*, 91(2), 143–175.
- Rai, N. D., Benjaminsen, T. A., Krishnan, S., & Madegowda, C. (2019). Political ecology of tiger conservation in India: Adverse effects of banning customary practices in a protected area. *Singapore Journal of Tropical Geography*, 40(1), 124–139. <https://doi.org/10.1111/sjtg.12259>
- Rasmussen, L. V., Coolsaet, B., Martin, A., Mertz, O., Pascual, U., Corbera, E., Dawson, N., Fisher, J. A., Franks, P., & Ryan, C. M. (2018). Social-ecological outcomes of agricultural intensification. *Nature Sustainability*, 1(6), 275–282. <https://doi.org/10.1038/s41893-018-0070-8>
- Reed, J., Ickowitz, A., Chervier, C., Djoudi, H., Moombe, K., Ros-Tonen, M., Yanou, M., Yuliani, L., & Sunderland, T. (2020). Integrated landscape approaches in the tropics: A brief stock-take. *Land Use Policy*, 99, 104822. <https://doi.org/10.1016/j.landusepol.2020.104822>
- Reed, J., Oldekop, J., Barlow, J., Carmenta, R., Geldmann, J., Ickowitz, A., Narulita, S., Rahman, S. A., van Vianen, J., Yanou, M., & Sunderland, T. (2020). The extent and distribution of joint conservation-development funding in the tropics. *One Earth*, 3(6), 753–762. <https://doi.org/10.1016/j.oneear.2020.11.008>
- Reid, J., & Rout, M. (2020). Developing sustainability indicators—The need for radical transparency. *Ecological Indicators*, 110, 105941. <https://doi.org/10.1016/j.ecolind.2019.105941>
- Reyes-García, V., Fernández-Llamazares, Á., Aumeeruddy-Thomas, Y., Benyei, P., Bussmann, R. W., Diamond, S. K., García-del-Amo, D., Guadilla-Sáez, S., Hanazaki, N., Kosoy, N., Lavidés, M., Luz, A. C., McElwee, P., Meretsky, V. J., Newberry, T., Molnár, Z., Ruiz-Mallén, I., Salpeteur, M., Wyndham, F. S., ... Brondizio, E. S. (2022). Recognizing Indigenous peoples' and local communities' rights and agency in the post-2020 biodiversity agenda. *Ambio*, 51(1), 84–92. <https://doi.org/10.1007/s13280-021-01561-7>
- Richards, D. R., & Friess, D. A. (2016). Rates and drivers of mangrove deforestation in Southeast Asia, 2000–2012. *Proceedings of the National Academy of Sciences of the United States of America*, 113(2), 344–349. <https://doi.org/10.1073/pnas.1510272113>
- Rode, J., Gómez-Baggethun, E., & Krause, T. (2015). Motivation crowding by economic incentives in conservation policy: A review of the empirical evidence. *Ecological Economics*, 117, 270–282. <https://doi.org/10.1016/j.ecolecon.2014.11.019>
- Rodriguez, I. (2017). Linking well-being with cultural revitalization for greater cognitive justice in conservation: Lessons from Venezuela in Canaima National Park. *Ecology and Society*, 22(4). <https://doi.org/10.5751/ES-09758-220424>
- Roesch-McNally, G., Chang, M., Dalton, M., Lowe, S., Luce, C., May, C., Morishima, G., Mote, P., Petersen, A. "Sascha", & York, E. (2020). Beyond climate impacts: Knowledge gaps and process-based reflection on preparing a regional chapter for the Fourth National Climate Assessment. *Weather, Climate, and Society*, 12(3), 337–350. <https://doi.org/10.1175/WCAS-D-19-0060.1>
- Rozzi, R. (2013). Biocultural ethics: From biocultural homogenization toward biocultural conservation. In *Linking ecology and ethics for a changing world* (pp. 9–32). Springer.
- Russell, R., Guerry, A. D., Balvanera, P., Gould, R. K., Basurto, X., Chan, K. M. A., Klain, S., Levine, J., & Tam, J. (2013). Humans and nature: How knowing and experiencing nature affect well-being. *Annual Review of Environment and Resources*, 38(1), 473–502. <https://doi.org/10.1146/annurev-environ-012312-110838>
- Sandbrook, C., Gómez-Baggethun, E., & Adams, W. M. (2022). Biodiversity conservation in a post-COVID-19 economy. *Oryx*, 56(2), 277–283. <https://doi.org/10.1017/S0030605320001039>
- Satterfield, T., Gregory, R., Klain, S., Roberts, M., & Chan, K. M. (2013). Culture, intangibles and metrics in environmental management. *Journal of Environmental Management*, 117, 103–114. <https://doi.org/10.1016/j.jenvman.2012.11.033>
- Satz, D., Gould, R. K., Chan, K. M. A., Guerry, A., Norton, B., Satterfield, T., Halpern, B. S., Levine, J., Woodside, U., Hannahs, N., Basurto, X., & Klain, S. (2013). The challenges of incorporating cultural ecosystem services into environmental assessment. *Ambio*, 42(6), 675–684. <https://doi.org/10.1007/s13280-013-0386-6>
- Schielein, J., & Börner, J. (2018). Recent transformations of land-use and land-cover dynamics across different deforestation frontiers in the Brazilian Amazon. *Land Use Policy*, 76, 81–94. <https://doi.org/10.1016/j.landusepol.2018.04.052>
- Schleicher, J., Eklund, J., Barnes, M. D., Geldmann, J., Oldekop, J. A., & Jones, J. P. G. (2020). Statistical matching for conservation science. *Conservation Biology*, 34(3), 538–549. <https://doi.org/10.1111/cobi.13448>
- Schleicher, J., Peres, C. A., Amano, T., Llactayo, W., & Leader-Williams, N. (2017). Conservation performance of different conservation governance regimes in the Peruvian Amazon. *Scientific Reports*, 7(1), Article 1. <https://doi.org/10.1038/s41598-017-10736-w>
- Schleicher, J., Schaafsma, M., Burgess, N. D., Sandbrook, C., Danks, F., Cowie, C., & Vira, B. (2017). Poorer without it? The neglected role of the natural environment in poverty and wellbeing. *Sustainable Development*, 26, 83–98. <https://doi.org/10.1002/sd.1692>
- Schlosberg, D. (2004). Reconciling environmental justice: Global movements and political theories. *Environmental Politics*, 13(3), 517–540. <https://doi.org/10.1080/0964401042000229025>
- Schneider, F., Kläy, A., Zimmermann, A. B., Buser, T., Ingalls, M., & Messerli, P. (2019). How can science support the 2030 agenda for sustainable development? Four tasks to tackle the normative dimension of sustainability. *Sustainability Science*, 14, 1593–1604. <https://doi.org/10.1007/s11625-019-00675-y>
- Schneider, F., Llanque-Zonta, A., Andriamihaja, O. R., Andriatsitohaina, R. N. N., Tun, A. M., Boniface, K., Jacobi, J., Celio, E., Diebold, C. L., Patrick, L., Latthachack, P., Llopis, J. C., Lundsgaard-Hansen, L., Messerli, P., Mukhovi, S., Tun, N. N., Rabemananjara, Z. H., Ramamonjisoa, B. S., Thongmanivong, S., ... Zaehring, J. G. (2022). How context affects transdisciplinary research: Insights from Asia, Africa and Latin America. *Sustainability Science*, 17, 2331–2345. <https://doi.org/10.1007/s11625-022-01201-3>
- Sterling, E. J., Pascua, P., Sigouin, A., Gazit, N., Mandle, L., Betley, E., Aini, J., Albert, S., Caillon, S., Caselle, J. E., Cheng, S. H., Claudet, J., Dacks, R., Darling, E. S., Filardi, C., Jupiter, S. D., Mawyer, A., Mejia, M., Morishige, K., ... McCarter, J. (2020). Creating a space for place and multidimensional well-being: Lessons learned from localizing the SDGs. *Sustainability Science*, 15(4), 1129–1147. <https://doi.org/10.1007/s11625-020-00822-w>
- Sukhdev, P. (2018). Smarter metrics will help fix our food system. *Nature*, 558(7708), Article 7708. <https://doi.org/10.1038/d41586-018-05328-1>
- Sutherland, W. J., Pullin, A. S., Dolman, P. M., & Knight, T. M. (2004). The need for evidence-based conservation. *Trends in Ecology & Evolution*, 19(6), 305–308. <https://doi.org/10.1016/j.tree.2004.03.018>
- Tauli-Corpus, V., Alcorn, J., Molnar, A., Healy, C., & Barrow, E. (2020). Cornered by PAs: Adopting rights-based approaches to enable cost-effective conservation and climate action. *World Development*, 130, 104923. <https://doi.org/10.1016/j.worlddev.2020.104923>
- Tengö, M., Hill, R., Malmer, P., Raymond, C. M., Spierenburg, M., Danielsen, F., Elmquist, T., & Folke, C. (2017). Weaving knowledge

- systems in IPBES, CBD and beyond—Lessons learned for sustainability. *Current Opinion in Environmental Sustainability*, 26–27, 17–25. <https://doi.org/10.1016/j.cosust.2016.12.005>
- Termansen, M., Jacobs, S., Mwampamba, T. H., Ahn, S., Castro, A., Dendoncker, N., Ghazi, H., Gundimeda, H., Huambachano, M., Lee, H., Mukherjee, N., Nemogá, G. R., Palomo, I., Pandit, R., Schaafsma, M., Ngouhou, J., Choi, A., Filyushkina, A., Hernández-Blanco, M., ... González-Jiménez, D. (2022). Chapter 3: The potential of valuation. In P. Balvanera, U. Pascual, M. Christie, B. Baptiste, & D. González-Jiménez (Eds.), *Methodological assessment report on the diverse values and valuation of nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (pp. 1–170). IPBES Secretariat. <https://doi.org/10.5281/zenodo.6521298>
- Thiry, G., Alkire, S., & Schleicher, J. (2018). Incorporating environmental and natural resources within analyses of multidimensional poverty. *OPHI Research in Progress*, 50a. <https://ora.ox.ac.uk/objects/uuid:c1606da2-bda3-4eac-a721-ef5f38ae2c23>
- Turetsky, M. R., Benscoter, B., Page, S., Rein, G., van der Werf, G. R., & Watts, A. (2015). Global vulnerability of peatlands to fire and carbon loss. *Nature Geoscience*, 8(1), Article 1. <https://doi.org/10.1038/ngeo2325>
- Turner, N. J., Gregory, R., Brooks, C., Failing, L., & Satterfield, T. (2008). From invisibility to transparency: Identifying the implications. *Ecology and Society*, 13(2).
- van Vliet, N., Mertz, O., Heinimann, A., Langanke, T., Pascual, U., Schmook, B., Adams, C., Schmidt-Vogt, D., Messerli, P., Leisz, S., Castella, J.-C., Jørgensen, L., Birch-Thomsen, T., Hett, C., Bech-Bruun, T., Ickowitz, A., Vu, K. C., Yasuyuki, K., Fox, J., ... Ziegler, A. D. (2012). Trends, drivers and impacts of changes in swidden cultivation in tropical forest-agriculture frontiers: A global assessment. *Global Environmental Change*, 22(2), 418–429. <https://doi.org/10.1016/j.gloenvcha.2011.10.009>
- Waldron, A., Adams, V., Allan, J., Arnell, A., Asner, G., Atkinson, S., Baccini, A., Baillie, J., Balmford, A., & Beau, J. A. (2020). Protecting 30% of the planet for nature: Costs, benefits and economic implications (Waldron Report 30 by 30).
- Walker, W., Baccini, A., Schwartzman, S., Ríos, S., Oliveira-Miranda, M. A., Augusto, C., Ruiz, M. R., Arrasco, C. S., Ricardo, B., Smith, R., Meyer, C., Jintiach, J. C., & Campos, E. V. (2014). Forest carbon in Amazonia: The unrecognized contribution of indigenous territories and protected natural areas. *Carbon Management*, 5(5–6), 479–485. <https://doi.org/10.1080/17583004.2014.990680>
- White, C. (2014). *Structured interview tools: Insights and issues from assessing wellbeing of fishermen adapting to change using scoring and ranking questions*. SAGE Research Methods Cases.
- White, S., & Blackmore, C. (2016). *Cultures of wellbeing: Method, place, policy*. Springer.
- Wieland, R., Ravensbergen, S., Greg, E. J., Satterfield, T., & Chan, K. M. A. (2016). Debunking trickle-down ecosystem services: The fallacy of omnipotent, homogeneous beneficiaries. *Ecological Economics*, 121, 175–180. <https://doi.org/10.1016/j.ecolecon.2015.11.007>
- Wilson, E. O. (2016). *Half-earth: Our planet's fight for life*. Liver.
- Woodhouse, E., Homewood, K. M., Beauchamp, E., Clements, T., McCabe, J. T., Wilkie, D., & Milner-Gulland, E. J. (2015). Guiding principles for evaluating the impacts of conservation interventions on human well-being. *Philosophical Transactions of the Royal Society B*, 370(1681), 20150103. <https://doi.org/10.1098/rstb.2015.0103>
- Wyborn, C., Datta, A., Montana, J., Ryan, M., Leith, P., Chaffin, B., Miller, C., & van Kerkhoff, L. (2019). Co-producing sustainability: Reordering the governance of science, policy, and practice. *Annual Review of Environment and Resources*, 44(1), 346. <https://doi.org/10.1146/annurev-environ-101718-033103>
- Wyborn, C., Davila, F., Pereira, L., Lim, M., Alvarez, I., Henderson, G., Luers, A., Martinez Harms, M. J., Maze, K., Montana, J., Ryan, M., Sandbrook, C., Shaw, R., & Woods, E. (2020). Imagining transformative biodiversity futures. *Nature Sustainability*, 3(9), Article 9. <https://doi.org/10.1038/s41893-020-0587-5>
- Yuliani, E. L., Moeliono, M., Labarani, A., Fisher, M. R., Tias, P. A., & Sunderland, T. (2022). Relational values of forests: Value-conflicts between local communities and external programmes in Sulawesi. *People and Nature*. <https://doi.org/10.1002/pan3.10389>
- Zafra-Calvo, N., Balvanera, P., Pascual, U., Merçon, J., Martín-López, B., van Noordwijk, M., Mwampamba, T. H., Lele, S., Ifejika Speranza, C., Arias-Arévalo, P., Cabrol, D., Cáceres, D. M., O'Farrell, P., Subramanian, S. M., Devy, S., Krishnan, S., Carmenta, R., Guibrunet, L., Kraus-Elsin, Y., ... Díaz, S. (2020). Plural valuation of nature for equity and sustainability: Insights from the Global South. *Global Environmental Change*, 63, 102115. <https://doi.org/10.1016/j.gloenvcha.2020.102115>
- Zurba, M., Petriello, M. A., Madge, C., McCarney, P., Bishop, B., McBeth, S., Denniston, M., Bodwitch, H., & Bailey, M. (2022). Learning from knowledge co-production research and practice in the twenty-first century: Global lessons and what they mean for collaborative research in Nunatsiavut. *Sustainability Science*, 17(2), 449–467. <https://doi.org/10.1007/s11625-021-00996-x>

## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

**Table S1.** Attributes of the workshop participants in terms of disciplinary and geographic focus, as well as the institution in which they were based at the time of their contribution to the workshops.

**Table S2.** Full methods and approaches utilized in the Special Feature collection, to understand, quantify and evaluate human well-being and relational values, for people living in tropical forest and fisheries land and sea scapes.

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