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Critical social perspectives in forest and landscape restoration – a systematic review

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In response to increasing calls for better consideration of social dimensions in Forest (and) Landscape Restoration (FLR), this systematic literature review identifies and synthesises relevant themes associated with critical social perspectives in FLR. Critical perspectives are methodologically diverse but generally share an intention to interrogate power and knowledge, challenge the '*status quo*' and 'taken-for-granted' assumptions, alongside promoting social justice. Critical perspectives therefore play a key role in illuminating complex social dimensions in global environmental governance. This review asks: *What is the role of critical social perspectives within the academic discourse on FLR, and what key insights about FLR have these perspectives provided over the period 2000–2023?* A total of 449 relevant academic papers were published during this period. An initial assessment of the abstracts, title and keywords found social dimensions were addressed in some way, even if only negligibly, in 211 of the 449 papers, and themes associated with critical social perspectives were evident in only 40 papers. These 40 papers were then read in full, and six key topic areas emerged: 1) Assumptions underpinning the links between FLR and human-wellbeing, particularly the tendency to measure human-wellbeing using simple economic indicators, were challenged as naïve and potentially misleading; 2) Tenure issues appear to be frequently under-appreciated, with serious consequences such as displacement of communities; 3) Top-down, technocratic models of governance are problematised for neglecting the socio-political contexts of FLR, which are laden with value and power asymmetries, as well as the implications of historical legacies (e.g., colonialism); 4) While there has been a proliferation of discursive intent to better 'engage local stakeholders', doing so remains opaque in principle and practice; 5) The heterogeneity of 'local stakeholders' emphasises the need to consider multiple intersections of social identities and diversity, and attend to gendered dimensions of FLR; 6) Accepting epistemological pluralism is considered fundamental to incorporating local and Indigenous Peoples' knowledges into more people-centred, locally-relevant FLR governance and practice. The review concludes that, if FLR is to genuinely pursue the imperative to enhance human-wellbeing alongside the goal of regaining ecological integrity, a recalibration of research priorities toward interdisciplinary social sciences, and better representation of locally-situated stakeholders, are required. This will involve deliberation between researchers, from both social and natural sciences, as well as practitioners; and making

concerted efforts to steer away from simplistic framings of the issues, toward more nuanced understandings of and responses to the systemic complexities embedded in FLR.

KEYWORDS

forest landscape restoration (FLR), critical perspectives, environmental governance, social dimensions, environmental justice, bonn challenge, UN decade of ecosystem restoration

1 Introduction

Planetary-scale environmental issues are a pressing challenge for communities globally. Widespread environmental degradation exacerbates and reduces resilience against climate change, impacting biodiversity, global food and water security and threatening the livelihoods of many who depend on their environment for subsistence or for cash income (Martin et al., 2016; Suding et al., 2015). The imperative to halt and reverse deforestation and degradation catalysed the global initiative known as Forest (and) Landscape Restoration (FLR) (Stanturf and Mansourian, 2020). While the use of trees and other vegetation to restore degraded landscapes and enhance the provision of ecosystem services is not novel (Laestadius et al., 2015), the concept and nomenclature of 'FLR' as now used in the academic literature and political discourse originates from a meeting of experts convened by the World Wide Fund for Nature (WWF) and the International Union for the Conservation of Nature (IUCN) in 2000, where FLR was defined as "a planned process that aims to regain ecological integrity and enhance human wellbeing in deforested or degraded landscapes" (WWF and IUCN, 2000).

The initial international institutional focus of FLR was the Global Partnership on FLR (GPFLR), initiated by IUCN and the United Kingdom Forestry Commission in 2003; in 2011, the Government of Germany and GPFLR established the Bonn Challenge, which is now the global centrepiece of FLR. The Bonn Challenge sets a voluntary global goal, comprising a series of national, sub-national and organisational pledges; its first target was restoring 150 million hectares of degraded and deforested landscapes by 2020, subsequently extended in conjunction with the New York Declaration on Forests to 350 million hectares by 2030 (Laestadius et al., 2015). As of 2024, restoration pledges total 215 million hectares across 61 countries (Bonn Challenge, 2024); while these commitments are not legally binding, they intersect with targets and initiatives under the Biodiversity and Climate Change Conventions, and with multiple SDGs (Abhilash, 2021; IUCN, 2019; Kleinschmit et al., 2023). Whilst the Bonn Challenge is a global focus for FLR initiatives, many multilateral, philanthropic and private-sector-led restoration initiatives and projects operate independently (e.g., Global Environmental Fund (GEF), Bezos Earth Fund, various 'trillion tree' initiatives[1]). The UN Decade on Ecosystem Restoration (2021–2031) (UNEP, 2021) provides both a broader platform and greater impetus for FLR as a focus of international and associated national policy and actions in support of restoration commitments (Stanturf, 2021; Young and Schwartz, 2019).

1.1 Issues and challenges in FLR

The goals of FLR are necessarily ambitious and in various respects contentious, and so FLR has been subject to critiques from a range of perspectives. Ecologists have been critical of FLR in cases where afforestation has occurred in landscapes that are not naturally forested (e.g., savannahs and rangelands) (Bond, 2016; Parr et al., 2024; Vetter, 2020), negatively impacting other environmental values and services (e.g., hydrology, habitat) (Temperton et al., 2019), or been 'blind' to the values of particular ecosystems, such as secondary forests and grasslands (Chazdon et al., 2016; Dudley et al., 2020). Similarly, the establishment of large-scale monoculture plantations, including those facilitated by carbon market-related initiatives such as REDD+, have been criticised for prioritising economic outcomes at the cost of biodiversity and social objectives (Di Gregorio et al., 2017; Lewis et al., 2019; Vijge and Gupta, 2014).

A less conspicuous but growing body of more socially-oriented literature recognises that FLR has emerged as essentially an environmental endeavour. Though 'enhancing human-wellbeing' is a goal stated in the original definition of FLR, in a perceived 'win-win' balance with 'regaining ecological functionality' (Reinecke and Blum, 2018; WWF & IUCN, 2000), the social sciences have received little mention in of the FLR literature, raising concerns that the social dimensions of FLR are relegated to secondary status (Aguiar et al., 2021; Elias et al., 2022; Yami and Mekuria, 2022) – despite mounting evidence of how social factors profoundly influence the effectiveness of FLR initiatives (Barrow, 2014; Fischer et al., 2023; Höhl et al., 2020) and increasing awareness of the multitude of social justice issues inherent in FLR endeavours (Elias et al., 2021; Kleinschmit et al., 2024; Mansourian et al., 2024; Ramčilović-Suominen et al., 2023).

The FLR literature is characterised by lack of clarity and agreement about the definition of FLR, and about the emphasis given to its various dimensions (Djenontin et al., 2020; Mansourian, 2018; Stanturf et al., 2019). For example, Chazdon et al. (2016) asked "When is a forest a forest?" (p. 538), and Hobbs (2016) wondered if landscapes were "Degraded or just different?" (p. 153). Boedhihartono and Sayer (2012) asked "Restoring to what, for whom?" and concluded that "restoration science has proven far better at solving the problems of 'how' to restore various sorts of degraded land than at addressing the problem of 'what' to restore" (p. 309), and feminist political ecology scholars have applied an intersectional lens probing the question of "Restoration for Whom, by Whom?" (Elias et al., 2021). Contributors to the conference and

1 Trilliontreecampaign.org (Plant for the Planet); 1t.org (World Economic Forum); trilliontrees.org (WCS, WWF, Bird Life International).

subsequent Special Issue addressing this topic found a "critical void lies at the heart of this [FLR] agenda" and argue that "urgent attention is needed to the power and politics that shape the values, meanings, and science driving restoration; and to the uneven experiences of these processes as national restoration pledges touch down in diverse and unequal contexts" (ibid: 3). In this context, *critical perspectives* can offer particularly useful insights.

1.2 Critical perspectives

The 'critical paradigm'[2] in research and philosophy challenges the positivist insistence on objective truths, and understands realities as socially constructed, shaped by personal experiences and historical factors, and therefore dynamic, as they respond to influences in the ever-unfolding-present (Cook and Wagenaar, 2012; Scotland, 2012, p. 13). Although diverse, critical perspectives generally share an intention to challenge the *status quo* and 'taken-for-granted' assumptions, alongside promoting social justice (Kuntz and Pickup, 2016). Notwithstanding, there are concerns over "the overuse and fashionable ambiguity" of the term 'critical' in this context (ibid, p. 171), and so it is necessary to clarify its use in any given application (Keller, 2017).

A helpful basis for doing so is Cox's (1981) theoretical distinction between '*critical* from '*problem-solving*' perspectives, which relates to the purpose they serve in addressing *problematics* (awareness of certain problems and issues) in any given field of inquiry. The latter are "a guide to help solve the problems posed within the terms of the particular perspective which was the point of departure" (p. 128). Thus, problem-solving perspectives are traditionally associated with the technical sciences and economics. However, a problem-solving perspective is a less useful, and often misleading, theoretical paradigm for socio-political and interdisciplinary areas of inquiry, such as environmental governance (Fuchs, 2017; Olsson and Jerneck, 2018).

In contrast, Gill (2019) explains that "critical perspectives seek to demystify questions of power and interrogate the relationship between rulers and the ruled, asking whether the ethical and practical aim of politics is to sustain, transform, or replace the *status quo*, and if so for what purposes. Critical perspectives place questions of ethics, justice and legitimacy, as well as of solidarity, inequality and sustainability at the center of their analysis" (p. 375).

1.3 Critical perspectives in environmental discourses

Critical perspectives play a key role in illuminating complex social dimensions which are often understated in environmental governance. Adjacent disciplines sharing characteristics of the FLR agenda have long recognised the importance of integrating critical perspectives into environmental science, politics and governance; for example, a special issue dedicated to *Critical perspectives of sustainable development research and practice* (Baumgartner, 2011). In a collection of essays Beck, 1995 urges that the focus of environmental politics must shift "from a scientifically inspired policy of revealing horror scenarios to a social science based redirection of accountability" (p. 15). Similarly, Lövbrand et al. (2015) point out that given the "emphasis on the human dimensions of environmental change it is remarkable, and highly paradoxical" that these discourses have "told us so little about societal dynamics" (p. 8). Furthermore, Fuchs (2017) argues that the distinct relationship between class, capitalism, historical legacies (e.g., colonialism) and the sustainability agenda, strongly warrants attention from critical theories.

As a key focus of current global environmental governance, the FLR agenda also deserves greater critical attention. FLR manifests in multi-levelled, multi-scalar contexts that demand consideration of themes such as equity and power asymmetries (e.g., between the Global North and Global South, elites and minorities, men and women, western science and local or traditional knowledge), and the implications of historical legacies such as colonialism (Kleinschmit et al., 2024; Mansourian et al., 2024). A number of reviews of the broader social dimensions of FLR–including of local stakeholders and livelihoods (Adams et al., 2016; Fernandes et al., 2022; Ota et al., 2020); gender (Ota et al., 2024); governance, principles and practices (César et al., 2021; Maniraho et al., 2023; Mansourian, 2016; Owusu et al., 2023; Yami and Mekuria, 2022; Yitbarek et al., 2023); and factors that generate success and failure in FLR (Djenontin et al., 2018; Höhl et al., 2020; Mansourian et al., 2021) – report an overall dearth of academic and political attention to the social dimensions in FLR and urge for this to be remedied. In these contexts, this systematic review responds to this gap, by asking: *What is the role of critical social perspectives within the academic discourse on FLR, and what key insights about FLR have these perspectives provided over the period 2000–2023?*

2 Methods

This systematic review[3] aims to identify critical social perspectives in the FLR literature, and to explore how FLR initiatives impact and are influenced by social dimensions. The search terms used were "forest landscape restoration" and "forest and landscape restoration" in the Scopus and Web of Science databases. These searches identified a total of 958 documents in the period 2000–2023, almost half of which were duplicates between the two databases. The review focussed on the peer-reviewed literature, and so books and book chapters, conference papers and other material outside the scope of this review were excluded. This left a final data set of 449 academic articles on

2 Paradigms can be defined as "preferred ways of understanding reality, building knowledge and gathering information about the world" (Tracy, 2013, p. 38), comprising "ontology, epistemology, methodology, and, methods" (Scotland, 2012).

3 Systematic reviews serve as an approach to examine extensive sets of information on a topic. They are useful for mapping trends, delineating zones of uncertainty, identifying areas with insufficient or absent research, and highlighting the need for new studies (Petticrew and Roberts, 2006, p. 3).

FLR published in the period since its definition in 2000 until the end of the review period (2023) (Box 1). These articles included both conceptual and empirical papers, many of which considered local case studies; and relevant review papers.

Assessment of the papers was a three-stage process, detailed below: the first was based on the abstract, title

BOX 1 Systematic Review Scope and Protocol

Search Terms: "forest landscape restoration" OR "forest and landscape restoration".
Search in: Title, Abstract, Keywords.
Years: 2000–2023.
Databases: Scopus and Web of Science.
Search Result: 958 Documents.
Screening: Removal of Duplicates and ineligible documents.
Total: 449 Articles.
Social Perspectives: 211 Articles.
Critical Social Perspectives: 40 Articles.

and keywords; the second on the abstract; and the third on the full text. No limitation was placed on the language of publication; 12 of the 449 articles were published in languages other than English, but with abstracts in English enabling their inclusion for the first two stages. However, none of these articles were identified as including a critical social perspective on the basis described below.

The first stage of the assessment noted the field or focus area of the paper and identified the presence or absence of a *social perspective(s)* in the abstract, title and keywords. The criteria for a 'social perspective' were broad, requiring only that some form of 'social' or 'human' element was mentioned, in contrast to being purely technical-scientific, economic, or policy-oriented. The field or subject areas were clustered into four emergent categories: Technical and Ecological, Policy and Governance, Socio-Ecological, and Economic. Articles addressing more than one field were categorised as the most prominent one, which was generally clearly evident.

In the second stage of the assessment, the abstracts of the articles identified in the first stage were read again to identify themes related to *critical social perspectives*. For the purposes of this review, articles deemed as offering critical perspectives may include one or more of the following characteristics: interrogation of power, social justice orientation, deconstruction of assumptions, contextual (historical, cultural, political) understanding or non-superficial engagement with diverse, especially marginalised, voices.

The third and final stage of assessment involved reading the full text of those articles flagged in the second stage as potentially presenting critical perspectives. At this stage, almost half of the articles were removed on the basis that the critical perspective flagged in the abstract was not substantiated by further commentary. The remaining articles (Supplementary Appendix S1) became the final dataset for this review. The analysis of the final dataset involved retrieving and synthesising information from the articles as relevant to the above-mentioned themes associated with critical social perspectives.

3 Results

Results are presented below, firstly in terms of the trends in publications over time, based upon interpretations of the abstracts of the full set of peer-reviewed publications (n = 449). This is followed by a synthesis of key themes emerging from the full text reading and analysis of articles identified as critical social perspectives (n = 40). In some places in the Results section, it is necessary to provide definitions or contextual references which draw upon literature outside of the dataset of this systematic review. These are included either as footnotes or as citations prefixed by '*see*'.

3.1 Trends in publications over time

Although the current definition of FLR dates from the 2000 WWF and IUCN workshop (see WWF and IUCN, 2000), as seen in Figure 1, the published academic literature in FLR remains relatively nascent in its first decade but has grown exponentially in the past decade, notably following the renewed Bonn Challenge in 2014 and peaking in 2021 at the commencement of the UN Decade of Ecosystem Restoration.

Of the total 449 articles, 211 included some, even if negligible, mention of social dimensions in the abstract, title or keywords, in contrast to 238 purely technical-scientific, economic or policy-oriented articles. The dominant field or focus area was Ecological and Technical (216 of 449) (see Table 1).

Papers that address critical social perspectives of FLR (Supplementary Appendix S1) are a minority of those that mention a social dimension (40/211). The first article identified in this set was published in 2014 (Barrow, 2014), however ~70% (28/40) emerge only in the last 3 years (2021–2023). The prominence of case studies in this set of literature is notable (27/40) geographically distributed across a diversity of countries and regions.

3.2 Key themes emerging from the critical social perspectives

This section provides a synthesis of the key themes emerging from the critical social perspectives identified in the FLR literature. The order of presentation broadly reflects the emergence of these themes in the literature. These begin simply by identifying the lack of attention to the social dimensions, and subsequently address the more complex negative impacts and issues stemming from the lack of attention to, and understanding of, the social dimensions of FLR.

3.2.1 Lack of attention to social dimensions

The original axiom underpinning the role of FLR in enhancing human-wellbeing is that degraded landscapes pose numerous risks and challenges to communities, and that healthy communities are associated with healthy landscapes (*see* WWF & IUCN, 2000). Under this logic, it follows then that restoration interventions for healthy landscapes will consequentially benefit local people's wellbeing, for example, through additional income opportunities from employment or payments for ecosystem services (Reinecke and Blum, 2018). However, the literature reviewed here more often reports the converse–that human wellbeing does not necessarily follow ecological restoration, and that social, rather than technical, factors are key determinants of the restoration outcomes (e.g., Barrow, 2014; Gregorio et al., 2020; Höhl et al., 2020). As the literature also reports numerous cases where social issues were

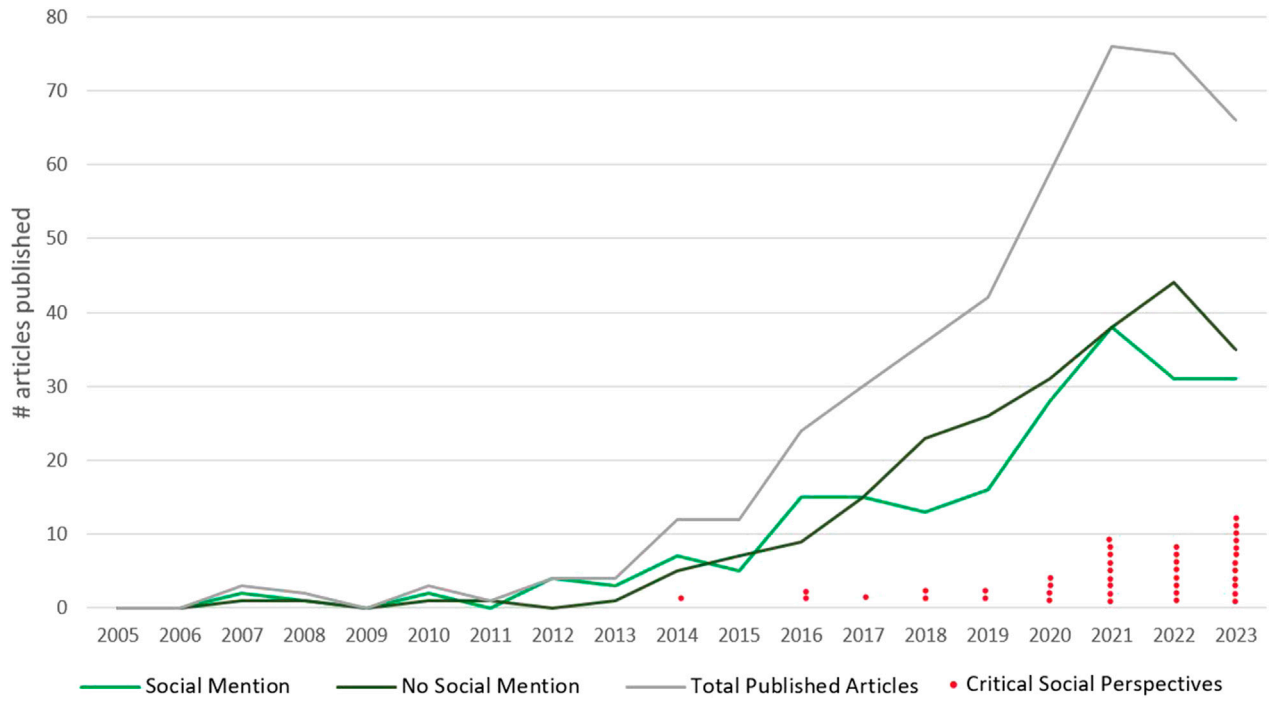

FIGURE 1
Articles published with the terms forest (and) landscape restoration in title, abstract or keywords, 2000–2023.

TABLE 1 Presence or Absence of Social Perspectives and fields of published literature represented in Figure 1.

Field or subject area	Total	Social perspective identified	No social perspective identified
Technical and Ecological	214	21	193
Policy and Governance	109	84	25
Socio-Ecological	103	99	4
Economic	23	7	16
Total	449	211	238

exacerbated rather than alleviated by FLR interventions (e.g., Baynes et al., 2017; Valencia, 2021; Whittaker, 2020). For these reasons, there have been consistent calls, from natural and social scientists alike, for greater attention to the social dimensions, and greater involvement in FLR from the social sciences. However, the articles reviewed here suggest minimal progress has been made on either of these fronts–social dimensions continue to be oversimplified and misunderstood (Carmenta et al., 2023; Elias et al., 2022), and social scientists remain a small minority in FLR research (Fernandes et al., 2022).

3.2.2 Human wellbeing being measured by economic indicators

Reviews of the social dimensions of FLR reveal that indicators of human-wellbeing, if included at all (Yami and Mekuria, 2022), have been widely interpreted as equivalent to economic measures (Adams et al., 2016), or the "tangible contributions of nature to material wellbeing" (Carmenta et al., 2023, p. 1722). Given FLR projects are predominantly located in the 'Global South', financial support and economic measures are certainly important (Erbaugh et al., 2020; Nuesiri, 2022; Owusu et al., 2023), but it has long been recognised that human-wellbeing is more complex than these indicators alone can suggest (Carmenta et al., 2023; *see also* UNDP, 2023).

Whilst socio-economic indicators might imply positive outcomes (e.g., increased income per household, increased employment), these do not fully characterise social impacts. The literature suggests there are several general ways in which simple economic indicators of FLR outcomes might be misleading. For example, income from restoration activities (e.g., payments for ecosystem services (PES), including carbon payments; employment) may be offset by loss of access to other essential resources (e.g., food supply, wood fuel) (Ahammad et al., 2023; Sacande and Muir, 2023; Valencia, 2021). In such cases, expenditure on staple livelihood needs increases as these need to be sourced from elsewhere, leading to an overall economic cost and disruption to key resilience assets. Similarly, anticipated long-term benefits for

sustainability (e.g., agricultural productivity, water quality) could be overshadowed by activities generating short term financial benefits or costs (Aguiar et al., 2021; McElwee and Nghi, 2021; Peterson et al., 2018; Wiset et al., 2023). Secondly, the labour burdens, usually carried most by those with little power in the decision-making processes (e.g., landless people, smallholders, women, youth), often outweigh the financial returns from employment (Djenontin et al., 2022; Elias et al., 2022; McElwee and Nghi, 2021), and cheap labour costs areas of impoverishment or low income can be exploited rather than alleviated (Nuesiri, 2022; Whittaker, 2020). A third strand is 'elite capture' of resources intended for wider community benefit, undermining the premise that funding and resources provided by restoration projects are shared equitably in communities (Barrow, 2014; Erbaugh et al., 2020; Nuesiri, 2022; Nzyoka et al., 2021).

On the other hand, the importance of finance and funding for local stakeholders should not be understated. Owusu et al. (2023) found financial aspects to be the most important factor to endogenous actors in FLR projects in Sub-Saharan Africa, in contrast to biodiversity for the exogenous actors. In a Cameroonian case study, Nuesiri (2022) noted the high transaction costs for local stakeholders involved in FLR, rendering effective and equitable governance, in the words of the article title, "neither easy nor cheap" (p. 1). The reliance of FLR on external funding and other forms of support also raises issues of continuity (Reinecke and Blum, 2018), as the expiry of project funding can lead to yet another disruption of local livelihoods and, commonly, the abandonment of the restoration efforts altogether (Wiset et al., 2023).

3.2.3 Underestimating the importance and complexity of tenure issues

Given that FLR is inherently about land and resource use, issues of tenure rights and security are fundamental to its implementation. Tenure can be defined as "the set of institutions and policies that determine how land and its resulting resources are accessed, who can benefit from these resources, for how long and under what conditions" (Robinson et al., 2014, p. 282; *in* McLain et al., 2021, p. 2). Tenure therefore also effects the roles and responsibilities of each stakeholder (group), and their rights and returns over the long-term (Sapkota et al., 2021, p. 5). Tenure insecurity for local stakeholders undermines FLR outcomes in a range of ways; conversely, tenure security increases restoration success and can be used as an incentive for FLR, provided that it does not come at the cost of exploiting weak institutional settings which perpetuate inequities (Nzyoka et al., 2021; Rakotonarivo et al., 2023).

The importance of clearly defined tenure parameters that are sensitive to current local contexts has often been underestimated in the initial planning and implementation of FLR, and become a barrier for many projects (Ahammad et al., 2023; Baynes et al., 2017; Liu, 2022; Rakotonarivo et al., 2023; Singh et al., 2021). Tenure ambiguity causes confusion and disenfranchisement amongst FLR stakeholders (Ahammad et al., 2023; Wiset et al., 2023), and may have more serious consequences such as displacement of people and undermining their livelihoods; such consequences are most often experienced by already vulnerable and marginalised groups (Aguiar et al., 2021; Elias et al., 2022; Melo et al., 2023; Valencia, 2021). While FLR assessment frameworks, such as the Restoration Opportunities Assessment Methodology (ROAM) (*see* IUCN & WRI, 2014), have responded by incorporating tenure elements, problems persist in the translation of this framework into practice. For example, researchers appraising the ROAM developments from eight countries in Africa and Latin America found tenure issues remain only "superficially covered", that assessments lacked a framework for evaluating connectivity between the elements, and noted that assessment teams were mostly composed of natural scientists whom lack the knowledge, skills and experience to carry out tenure assessments (McLain et al., 2021).

Awareness of existing tenure systems, including how they have been shaped, is essential for FLR that is attentive to social dimensions (McLain et al., 2021). In the Latin-American context, Aguiar et al. (2021) explain how post-colonial land distribution has been a "chaotic and uneven" process, warning that there is "Danger (often killings) over land, and illegal uses, meaning land availability for FLR often targets indigenous and local peoples lands" and therefore "external pressure from tree planting initiatives lead to loss of livelihoods" (p. 526). Melo et al. (2023), p. 2 also note, for the case of Brazil, that agricultural landscapes are highly variable in property size and power of the landholders. A one-size-fits-all restoration agenda in these landscapes can therefore disproportionately impact already impoverished smallholders practicing small-scale agriculture and be of little consequence to the financially powerful large landholders practicing intensive agriculture. Furthermore, many landscapes in which FLR is implemented are governed by customary land tenure systems, requiring a nuanced understanding to avoid project failure and/or exacerbating community tensions, such as those evident in a Papua New Guinean (PNG) case in which family-rather than community-based approaches were appropriate (Baynes et al., 2017; Wiset et al., 2022). Others may be on leased land, the terms of which may mitigate against a sense of custodianship and the long-term commitments required for FLR (Djenontin et al., 2022; Peterson et al., 2018, p. 70).

Awareness of existing local uses of the landscapes and regulations governing access and ownership of resources is also essential, as displacement of users can occur indirectly. If access to landscapes and essential resources (e.g., food, grazing, wood fuel, cultural needs) is cut off through changed tenure arrangements under FLR, those dependent on the land and resources may be forced to migrate to urban centres, which can additionally lead to labour shortages in rural areas; or placed in oftentimes dangerous positions of needing to trespass against imposed restrictions for subsistence (Barrow, 2014; Nuesiri, 2022). Without alternative pathways for resolution, some disempowered and displaced communities have resorted to protests, such as burning FLR plots[4] (Rakotonarivo et al., 2023; Valencia, 2021).

Different tenure systems require different approaches with precise attention to power asymmetries that may lead to outcomes such as elite capture, disharmony or dispossession (Djenontin et al., 2022; Rakotonarivo et al., 2023; Yami and Mekuria, 2022); thus, FLR ambitions must also be matched by political will for forest tenure reforms (Valencia, 2021). FLR is

4 this form of resistance has been described as "weapons of the weak" (*see* Scott, 1985).

unlikely to succeed where tenure reforms are accompanied by complex and cumbersome processes, entangled with messy policy overlaps, or simply dismissed if inconvenient to more dominant actors and institutions and their interests; and where violations of tenure security are a risk, there is a need for legislative mechanisms to ensure tenure rights and processes are clear and formally recognised (Ahammad et al., 2023; Fischer et al., 2023; Govindarajulu et al., 2023; McLain et al., 2021; Rakotonarivo et al., 2023). Tenure is ultimately determined through decision-making processes, therefore highlighting the centrality of governance dynamics to FLR.

3.2.4 Asymmetries in governance dynamics

At the most general level, 'governance' describes "any effort to coordinate human action towards goals" (*see* Rayner et al., 2010, p. 15); *forest governance* has been defined as "a) all formal and informal, public and private regulatory structures, i.e., institutions consisting of rules, norms, principles, decision procedures, concerning forests, their utilisation and their conservation, b) the interactions between public and private actors therein and c) the effects of either on forests" (*see* Giessen and Buttoud, 2014, p. 1). The governance of *landscapes* demands consideration of both 'the "politics" of scale and the "natural" conditions of places' (*see* Görg, 2005). However, while FLR practitioners "understand reasonably well many of the technical aspects of forest restoration, they have a much poorer understanding of governance dimensions" (*see* Mansourian, 2016, p. 267).

The FLR agenda is multi-level and multi-scalar, encompassing numerous stakeholders and sectors, across local to global contexts, and various levels of institutional collaboration (Mansourian, 2021). There are 'vertical dynamics' representing hierarchical flows of decision-making between levels; 'horizontal dynamics' describing networks of formal (e.g., agencies, councils, unions, policies, laws) and informal (e.g., socio-cultural norms and customs) institutions at each level (Owusu et al., 2023, p. 248); and diagonal pathways between them (Nuesiri, 2022; Peterson et al., 2018). This degree of complexity and scale calls for more polycentric conceptualisations of FLR governance with precise attention to power dynamics (Fischer et al., 2023; Peterson et al., 2018; Wiset et al., 2023, p. 23).

Governance processes determine the "who, what, where, when, how, and why" of FLR (Wilson and Cagalanan, 2016, p. 12). As a global agenda, FLR has been predominantly enacted through 'top-down' approaches, guided by those selected to have appropriate expertise in the given area, usually based on scientific and technical knowledge (Reinecke and Blum, 2018; Urzedo et al., 2023). Such approaches tend to overlook the socio-political context and the needs, customs and knowledge of the people directly affected, whom have comparatively little agency under this dynamic (Owusu et al., 2023), and are exemplified by the use of remotely-sensed (satellite) data to identify (global) restoration or tree planting potential and priorities (*see* Bastin et al., 2019; Crouzeilles et al., 2020; Laestadius et al., 2011; Strassburg et al., 2020; WRI, 2014)). However, these assessments do not take into consideration key social factors, such as Indigenous territories, cultural wellbeing, local community dependencies on current land uses, and associated food and tenure insecurities, (Erbaugh et al., 2020; Melo et al., 2023; Rakotonarivo et al., 2023).

Furthermore, local or traditional knowledges and languages are often excluded from, or incompatible with, large-scale technological tools and their development (Barragán and Prescott, 2023). Urzedo et al. (2023) point out these technologies "tend to be undertaken in the Global North for restoration projects in the Global South" (p. 488) and therefore should not be considered neutral tools but rather power-laden processes with implications for equity. Similarly, the western-scientific orientation and funding mechanisms underpinning governance in the FLR agenda may, wittingly or unwittingly, reproduce and perpetuate colonial injustices (Adeyeye et al., 2019; Erbaugh et al., 2020; Kamelamela et al., 2022; Valencia, 2021). Top-down governance has resulted in social justice issues, conflict and ultimately failure in many restoration projects (Aguiar et al., 2021; Djenontin et al., 2022; Liu, 2022; Melo et al., 2023; Rakotonarivo et al., 2023; Wiset et al., 2023). It is evident that more inclusive FLR strategies are needed to "ensure that local people serve as more than passive beneficiaries" and place "them in their appropriate role as the central stakeholders driving implementation" (Singh et al., 2021, p. 108).

There is an established body of research showing how local actors "possess a comparative advantage for coordinating local governance functions" (Fischer et al., 2023, p. 1345), and are better placed to ensure continuity of restoration efforts (Erbaugh et al., 2020; Owusu et al., 2023, p. 255). Therefore there has been increasing recognition that FLR initiatives ought to be shaped by and work within the local context, *viz.* Taking a grassroots, people-centered and rights-based approach (Elias et al., 2022; Erbaugh et al., 2020; Govindarajulu et al., 2023; Maniraho et al., 2023; Sapkota et al., 2021; Wilson and Cagalanan, 2016) with appropriate devolution and decentralisation of decision-making power (Barrow, 2014; Liu, 2022; Nzyoka et al., 2021; Valencia, 2021; Wiset et al., 2023). Such models focus on establishing aims, needs and knowledge at the local level, supported by funding, resources, technical and policy assistance where necessary from the global level (Nuesiri, 2022; Owusu et al., 2023).

3.2.5 Engaging vs. prioritising local stakeholders

Despite widespread recognition in the FLR discourse of the importance of local stakeholder participation in FLR governance (Reinecke and Blum, 2018), in practice this remains ambiguous (Carmenta et al., 2023; Elias et al., 2022), and susceptible to varying interpretations and degrees of efficacy of enactment (Adeyeye et al., 2019; Maniraho et al., 2023). Wiset et al. (2023) argue that "local engagement does not simply mean contracting local people to do some of the on-ground reforestation activities", but rather "effective engagement will only occur when local people can influence and have some control and power to make meaningful decisions for FLR implementation" (p. 9). Thus, it is argued that FLR initiatives need to move beyond vague claims of stakeholder participation toward formal recognition of local management and governance (Fischer et al., 2023; Govindarajulu et al., 2023). Erbaugh et al. (2020) make the case that the various synonyms used to express 'engaging' local stakeholders in FLR governance are insufficient, and perhaps part of the problem; and that a sentiment such as 'prioritised' would better reflect how FLR governance should be developed.

The participation of local stakeholders in FLR governance must account for differences in interests and values at local level compared to those generally held at the global or national levels

of the agenda. While the main priorities of the exogenous actors in FLR generally focus on the global objectives of biodiversity and climate mitigation (Owusu et al., 2023; Yami and Mekuria, 2022), local stakeholders hold a variety of priorities depending on the context. For example, in agricultural landscapes, issues such as soil fertility and water availability are important (Djenontin et al., 2022), as are poverty alleviation and food security for those living at the frontiers of severe hardship (Liu, 2022; Maniraho et al., 2023; Sacande and Muir, 2023; Whittaker, 2020) and culturally significant dimensions for Indigenous Peoples (Adeyeye et al., 2019; Kamelamela et al., 2022).

This disjunct in priorities operates in conjunction with power imbalances between endogenous and exogenous actors, such as that found by Owusu et al. (2023), p. 253 in the Sub-Saharan African context, in which exogenous actors had the capacity to leverage a range of (dis)incentives to achieve their interests while endogenous actors had no such capacities. Additionally, it is important to elevate recognition of a range of actors in horizontal networks, including the facilitating role of local extension officers and local universities and academics (Djenontin et al., 2022; Gregorio et al., 2020; Peterson et al., 2018; Wiset et al., 2023). Further, a number of authors highlight as a critical success factor the motivation provided by 'personalities' whom Barrow (2014) calls 'local champions', and through whom local people feel heard and their knowledge valued (Nzyoka et al., 2021; Djenontin et al., 2022; Melo et al., 2023).

Other aspects notable at the local level, yet comparatively overlooked in most accounts of the social dimensions, are more relational themes. For example, social capital (e.g., community harmony, trust, respect, joy, peace building) appears of high-importance local-level actors (Adeyeye et al., 2019; Carmenta et al., 2023; Elias et al., 2022; Gregorio et al., 2020; Kamelamela et al., 2022; Maniraho et al., 2023; Whittaker, 2020). So does feeling valued, in terms such as those described by Peterson et al. (2018) in Kenya, where focus group participants made clear that "they value what they bring to the work of gully rehabilitation and do not appreciate when those assets are not recognized" (p. 76) (*also* Maniraho et al., 2023). Where exogenous groups or individuals are to be working on, researching and contributing to decision making processes in a particular local FLR context, they need to engage over a timeframe sufficient to foster trust; develop intimate knowledge, networks and experience; and maintain these throughout the duration of the restoration project (Baynes et al., 2019; Owusu et al., 2023; Peterson et al., 2018). In doing so exogenous actors avoid the phenomenon of acting as "missionaries" and should instead consider themselves "detectives" trying to uncover what is needed by listening (Filer, 2000, p. 7; *in* Baynes et al., 2017, p. 129).

When there is a greater focus on issues of engaging 'local stakeholders', the heterogeneity of these stakeholders become apparent (Maniraho et al., 2023). The diversity of individuals and entities represented by the term 'local stakeholders' do not necessarily hold shared ambitions nor equal powers (Elias et al., 2022). Social identities are embedded in complex networks; therefore, a multidimensional, intersectional perspective, attentive to factors such as class, ethnicity, gender, age, Indigeneity, vocation and historical context, are required to both understand and elevate human wellbeing for more equitable FLR (Carmenta et al., 2023). Two of the most prominent areas of discussion in this literature are Women and Indigenous Peoples, summarised below.

3.2.6 Gendered aspects of FLR

As the impacts of FLR on gender have become progressively more visible, restoration projects increasingly "mention that they include the voices of women and other marginalized groups", yet do not appear to "include them in substantive decision-making" (Singh et al., 2021, p. 111). In PNG, Baynes et al. (2017) note the exclusion of women in participatory processes associated with restoration projects, and highlight the tension between working in patriarchal social systems and satisfying FLR principles of enhancing gender equity (*see* Sabogal et al., 2015). Such observations are shared in numerous FLR contexts: for example, in Thailand, women's participation (i.e., interest) in village meetings for the FLR projects was high (80% of attendees), yet they remained largely excluded from positions of authority or participation in decision making processes (Sapkota et al., 2021, p. 7); in Malawi, gender-based norms "grant men *de facto* authority and privileged access to productive inputs" while "restrict [ing] women (and women-headed household)'s land restoration efforts" (Djenontin et al., 2022, p. 16; Whittaker, 2020). The PNG case also illustrates the complexity of gender relations in different cultural contexts, and cautions against projecting western perceptions of the subversion of women[5]; in that case it became apparent that women "exercised their power simply by deciding what work to do ('voting with their feet')", which appeared to be accepted by men, illustrating "that women can exercise significant "informal" power, simply by ignoring or modifying more formal decisions" (Wiset et al., 2022, p. 6).

Gender-responsive FLR demands attention to gendered aspects of restoration research and practice (Sapkota et al., 2021). Examples from the FLR literature includes interviewing men and women separately (Baynes et al., 2019; Nzyoka et al., 2021; Singh et al., 2021; Whittaker, 2020); providing food in meetings so that women can be released from their cooking responsibilities (Baynes et al., 2019); keeping in mind women's responsibilities (e.g., to family) and accessibility (e.g., transport options) when determining the timing and location of activities (Whittaker, 2020); or targeting inclusive spaces for communication and information sharing, as was done in Kenya with football matches and clubs–a popular national sport which all genders, ages, and classes participate in (Peterson et al., 2018, p. 77).

As more sex-disaggregated data is collected, some gendered differences in tree-planting preferences have been illuminated (Elias et al., 2022). It is often found that women prefer multifunctional tree planting using approaches which enhance food security and fuelwood production (e.g., agroforestry), which may be de-emphasized in reforestation projects (McElwee and Nghi, 2021, p. 57). In contrast, men tend to prioritise income increasing opportunities (e.g., commercial monoculture plantings) (Singh et al., 2021; Wiset et al., 2022). In addition to being (generally) better aligned with community rather than individual interests, meeting women's needs can offer further co-benefits. For example, time saved from foraging staple food products and

5 *see* Mohanty's (1988) essay 'Under Western Eyes'.

resources leads to more quality time spent with family or pursuing education (Adams et al., 2016; Barrow, 2014, p. 4); or the important role that women play in ensuring ongoing management and care for FLR projects in cases where men migrate for employment opportunities (e.g., mining) (Gregorio et al., 2020); and a general acknowledgement that the involvement of women in FLR activities enhances the positive outcomes (Nzyoka et al., 2021). For these reasons there have been calls for women to be considered essential restoration agents (Adams et al., 2016; Gregorio et al., 2020; Whittaker, 2020). To fully realise this potential, ongoing research and attention to this area will be necessary and over-generalised assumptions about what gender equality looks like must be avoided (Djenontin et al., 2022; Elias et al., 2022; Wiset et al., 2022).

3.2.7 Indigenous rights and knowledge

An increasingly prominent and sensitive area of discussion in FLR is the involvement and rights of Indigenous Peoples[6]. Cases are reported of FLR exploiting tenure insecurity and encroaching on Indigenous Peoples' lands (e.g., in 'protected' areas), in conjunction with exclusion from governance processes; these injustices have been "associated with environmental conflicts, poor conservation performance and negative social outcomes" (Erbaugh et al., 2020, p. 1472; Aguiar et al., 2021). Conversely, it is well-documented that Indigenous Peoples, their land management practices, and knowledge systems can contribute greatly to FLR objectives (Elias et al., 2022; Kamelamela et al., 2022). Subsequent appeals for the inclusion of Indigenous Peoples and their knowledges to be central to the FLR agenda are now widespread (Fischer et al., 2023; Nzyoka et al., 2021); this is not a straightforward task, and one which requires keen attention to matters of social and environmental justice (Carmenta et al., 2023).

In addressing this issue, there is firstly a need to recognise the pervasive legacies of historical, often colonial, and contemporary injustices including dispossession of traditional lands, historical trauma, and power asymmetries in socio-political processes (Kamelamela et al., 2022). Without formally recognised land, resource and knowledge rights, Indigenous actors lack agency in FLR governance and processes, leaving them vulnerable to exclusion and exploitation as well as hindering efforts to promote their participation (Erbaugh et al., 2020). Claiming formal rights[7] over traditional territories and resources is, however, a politically charged and difficult process often at odds with state or private interests (Aguiar et al., 2021; Valencia, 2021).

Indigenous researchers and stakeholders express frustration at the apparent disconnect between the enthusiastic support for greater representation and participation of Indigenous Peoples in FLR discourses and the often-perfunctory actions to make this a reality (Adeyeye et al., 2019; Kamelamela et al., 2022). For example, through a collaborative ethnographic study of World Conservation Council (WCC) conferences, Adeyeye et al. (2019) found that "the structure of the WCC upheld prevailing power relations among actors and more powerful actors hold limited views about what constitute meaningful participation and [a] pervasive view of Indigenous knowledge as a supplementary knowledge form in FLR debates" (p. 1).

While Aguiar et al. (2021) suggest that there are "many instruments for bridging or weaving indigenous and local knowledge and science for conducting collective decision-making regarding the design, implementation, and monitoring of interventions" (p. 531), these do not resolve the underlying dominance of the western scientific paradigm in FLR. For instance, whereas practices such as dance and storytelling are considered core components of knowledge and relationship building processes in many Indigenous cultures (Kamelamela et al., 2022; Urzedo et al., 2023), they are often viewed as 'entertainment' at conferences under the guise of 'acknowledgement' (Adeyeye et al., 2019). Furthermore, Indigenous perspectives highlight the vital importance of relational and sentimental values, e.g., empathy, trust and joy, which the scientific paradigm tends to dismiss as emotions or moods rather than acceptable indicators to measure wellbeing in a landscape (Adeyeye et al., 2019; Carmenta et al., 2023; Kamelamela et al., 2022). Lastly, at the very fundamental level, the western dualism that separates humans and nature is an uncomfortable fit with most, if not all, Indigenous ontologies. If the FLR agenda is to genuinely promote the participation of Indigenous Peoples, it must confront epistemological and ontological diversity and take into account the plural ways of knowing and values attributed to 'nature' and 'human-nature' relationships (Carmenta et al., 2023).

4 Discussion

The Discussion first synthesises the key insights from this review. It then explores the centrality of power underlying these insights, further informed by sources outside of the scope of the review.

The results presented above reveal that there has been a general increase in acknowledgement of social dimensions in the published academic FLR literature over the review period, albeit less consistently than the dominant non-social counterpart (Figure 1). The number of articles addressing critical social perspectives also rose gradually over time, although to a much lesser extent; and consequently the complexity of social dimensions continue to be underestimated. The articles reviewed suggest that interventions that are not sensitive to nor well-aligned with social contexts and realities often lead to outcomes that are undesirable or suboptimal for both people and the environment.

Overall, a repeating pattern of discursive shifts without shifts in praxis is evident in the literature: a social issue is identified, a solution proposed and then normalised, or at least adopted in the language used to discuss FLR–yet the issue continues to emerge in the literature and case studies 'on the ground' with little evidence of progress, and thus the pattern repeats. Examples include McLain et al., 2021 appraisal of the limitations of ROAM methodologies in addressing tenure issues; Adeyeye et al. (2019) highlighting the tendency for 'tokenism' in Indigenous participation

6 noting a number of synonymous terms, e.g., First Nations, and that the choice of term should be the People's themselves. "Indigenous" is used here, consistent with the majority of the literature.

7 Note - the concept of 'legally owning' land and natural resources is antithetical to many Indigenous ontologies (Ramčilović-Suominen et al., 2023).

in the global restoration community; the difficulty of reconciling principles of gender equity in diverse socio-political contexts (e.g., Baynes et al., 2019; Whittaker, 2020); and the ambiguities and complexities associated with various expressions of better 'engaging local stakeholders' (e.g., Carmenta et al., 2023; Elias et al., 2022; Erbaugh et al., 2020). In other words, it appears that many social issues are paid lip-service, and become normalised but oversimplified, yet remain essentially unaddressed in practice. Merely acknowledging social dimensions does not imply that they have been or will be adequately addressed.

The issues identified in this review cover themes that have already been subject to much deliberation predating the definition of FLR in 2000. Indeed, the first principle of the Rio Convention states "Human beings are at the centre of concerns for sustainable development" (UNCED, 1992); social impact assessments, for example, have long recognised a diversity of the negative social outcomes of FLR highlighted in this review (*see* Burdge and Vanclay, 1996; Vanclay, 2003). It is worth noting the earliest article identified here as bringing a critical social perspective reports a project partner's reflection on what is widely regarded as a FLR flagship success story - the HASHI project in Shinyanga, Tanzania. In this, Barrow (2014) emphasises the importance of diverse socio-political factors over technical factors and the prioritisation of local communities, including their interests and knowledges. The HASHI project was initiated in 1985, long before and evidently serving as an inspiration for the FLR agenda (*see* Scott, 2001). Given the well-established efficacy of people-centred approaches in contrast to their limited adoption, exploring the reasons for this disjunct is a pressing issue for those involved in all spheres of the FLR community, and one in which the (critical) social and interdisciplinary sciences are especially useful (Fleischman et al., 2022; Fuchs, 2017; Lövbrand et al., 2015; Olsson and Jerneck, 2018).

The centrality of power to the outcomes and impacts of FLR activities is evident from this review of the social dimensions of FLR. Although few articles address power explicitly, it is apparent that various dimensions of power underly each of the key themes identified by the critical perspectives. Adapting Morrison et al. (2019) analysis of power to FLR: power manifests as *decision-making* power (i.e., governance), which depends upon *framing* power (e.g., defining the problem, cause, solution), which in turn depends upon supporting *knowledge* systems (e.g., western science) and their perceived legitimacy in political, private and public spheres; this, in turn, leads to the power associated with *funding*.

To understand the how the various dimensions of power interact in FLR it is useful to draw upon Kleinschmit et al. (2023), p. 59 'three logics' in international environmental governance: 1) production and market logic (economic); 2) the ecological sustainability logic, addressing environmental challenges such as climate change and biodiversity loss (ecological); and 3) the community and empowerment logic (social); this interplay between the economic, environmental and social dimensions has been the dominant framing of sustainable development since the Brundtland Commission's 'Our Common Future' (1987) (Brundtland, 1987) and Rio Earth Summit (UNCED, 1992). Each logic broadly represents different actor groups, their interests, and the perspectives which inform them. Examining FLR framing and governance through these logics reveals how the socially oriented logic is eclipsed by the dominant power of the other two logics, which have mutually benefitted from what Taylor and Buttel (1992) label the 'moral-technocratic' alliance.

Critical reflections in FLR must consider the historical context from which FLR evolved through to the current institutions which promote it. If we visualise a global map depicting the regions from which the sources of power in FLR (governance, framing, knowledge, funding) emerge, and the regions upon which that power extends its influence (the physical implementation of FLR) – the FLR agenda mirrors colonial era dynamics–carrying significant implications for equity and justice (Ramčilović-Suominen et al., 2023; Wilkens and Datchoua-Tirvaudey, 2022). Historical legacies have resulted in deeply entrenched power asymmetries between local stakeholders and those driving FLR (States, NGOs, Private Companies), whom Duffy (2013) calls 'transnational decision makers' of the Global North. As dominant actors in the FLR discourse, the 'moral-technocratic alliance' between 'transnational decision makers' underpins the power to frame FLR–they determine what the problem, cause and solution is, what forms of knowledge are considered legitimate, which indicators should be used for appraisals, and guide decision-making by determining where funding is directed (Taylor and Buttel, 1992).

The power of framing is pivotal (Lakoff, 2010). Like other forms of global environmental governance (e.g., hard law instruments such as CITES; Duffy, 2013), FLR has been predominantly framed by and for institutions of the Global North (Okereke, 2019). Such framing tends to leverage romanticised ideals and imagery (e.g., charismatic species and 'pristine wilderness'; Goodman et al., 2016; Kanowski and Williams, 2009; Nelson, 2003), driven by (or designed to appeal to) western environmentalism logic and legitimatised by western sciences (e.g., Argyrou, 2005; Osaka et al., 2021), and also misrepresents the social context–people, their livelihoods, identity, knowledges and agency (e.g., Beymer-Farris and Bassett, 2012; Forsyth and McDermott, 2022). Such tendencies distort both ecological and social realities in the context where FLR takes place. Attention is therefore needed to improve research practices and communicate FLR imperatives with the public, private and political spheres which does not resort to idealised and misleading frames (Chignell and Satterfield, 2023). New narratives which better capture the lived experiences and realities of contexts facing environmental degradation must be communicated for more relevant solutions which do not undermine social justice in pursuit of addressing global environmental challenges (Ramčilović-Suominen et al., 2023).

Hence, the results of this review support the call by many for the effective enactment of people-centred approaches to FLR that prioritise local communities and knowledges, and pay precise attention to people who are typically marginalised in this context (Elias et al., 2022; Erbaugh et al., 2020; Fleischman et al., 2022; Mansourian et al., 2024). Addressing social dimensions in the FLR agenda requires qualified personnel - interdisciplinary social researchers and practitioners familiar with a variety of intersecting systems and an added imperative to seek personnel located in or from closer proximity to the FLR context. Recurrent calls for better integration of social sciences and local expertise since the early stages of FLR have failed to gain traction at the global level of the agenda, or in much of its implementation in the Global South. It is possible that the progressive framing of FLR as a predominantly ecological and technical issue may have dissuaded social scientists

and humanities scholars from engaging with the topic, as Vadrot et al., 2018 found for the work of IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services). Therefore, concerted effort is necessary to find ways to encourage participation from these fields, and to work towards a reorientation of funding for both research and prioritisation of these perspectives in FLR decision-making.

In conclusion, the body of academic literature reviewed challenges assumptions underpinning the links between FLR and human-wellbeing, illustrating how the imperative to 'regain ecological functionality' is not inherently beneficial to those directly impacted; nor should it be presumed local stakeholders share priorities established at the global level of the FLR agenda. The literature highlights a tendency to measure human-wellbeing using simple (socio)economic indicators and explains how this can be misleading in various ways. Matters related to tenure are widely underestimated often leading to project failure, disenfranchisement of local people, and with serious consequences such as conflict and displacement. Top-down, technocratic systems of governance in FLR are problematised for neglecting the socio-political context. Likewise, the literature reviewed demonstrates how the proliferation of discursive intent to better 'engage local stakeholders' remains opaque in terminology, principle and practice, laden with value and power asymmetries. Critical social perspectives underscore multiple intersections of diversity in FLR, insisting local stakeholders are not homogenous and emphasise the need to consider social identities; including the relationships or differences between them, and the implications of (formal and informal) institutional settings. Finally, recognising ontological and epistemological pluralism is fundamental to leveraging local and traditional knowledges which are widely acknowledged as key to effective FLR.

The review provides a foundation for increasing attention to the critical social dimensions in FLR, cognisant of and without compromising its inherent complexity. These findings support those of other researchers and practitioners calling for better consideration and understanding of the social dimensions in FLR (Mansourian et al., 2024), and a recalibration toward people-centred approaches (Kleinschmit et al., 2024). This requires an overhaul of technocratic processes and a re-balancing of power in governance, knowledge, framing and funding, across a more representative spectrum of perspectives (Adeyeye et al., 2019; Kleinschmit et al., 2024; Wilkens and Datchoua-Tirvaudey, 2022), more engagement with the social sciences, and better representation of those located in closer proximity to and are familiar with the specific FLR context.

While comprehensive, the scope of this review was limited to 'Forest (and) Landscape Restoration' in published journal articles, which may not capture some important contributions from parallel strands of literature, e.g., 'ecological restoration'; or other sources such as book chapters, reports and grey literature; and work on FLR in languages other than English. Further reviews and research into critical perspectives in these bodies of literature would be worthwhile.

Future research should consider integrating a critical lens when examining these dimensions, especially for interrogating underlying assumptions and the influences and intersections of power asymmetries which demand further attention. Additionally, given the predominance of case studies in the literature that offer critical perspectives, elevating case studies and comparative analysis appear, as Löfqvist et al. (2023) argue, particularly useful for capturing and enhancing the knowledge base for contextual variances and similarities. This will involve meaningful, sustained deliberation between interdisciplinary researchers, practitioners and locally situated stakeholders, steering away from simplistic framings and toward deeper understandings of systemic complexities embedded in FLR.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

MS: Conceptualization, Formal Analysis, Writing–original draft, Writing–review and editing. PK: Conceptualization, Methodology, Supervision, Writing–review and editing. DK: Conceptualization, Methodology, Supervision, Writing–review and editing. RI: Conceptualization, Supervision, Writing–review and editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fenvs.2024.1466758/full#supplementary-material

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