

Editor summary:

Amid escalating climate and biodiversity crises, restoration of degraded lands is urgent. In this Perspective, the case for justice at the core of restoration practice is made, going beyond superficial approaches and providing a more robust path toward a truly just and transformative restoration.

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Title:

Towards just and transformative social-ecological restoration

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Preface

In the face of the climate and biodiversity crisis, global targets for the restoration of degraded lands have become ever more ambitious and urgent. In this perspective we explain the case for placing justice at the heart of restoration practice. Whilst this is increasingly accepted, there is an unfortunate tendency to address justice in superficial ways, through tokenistic forms of participation and benefit-sharing. We address this problem by classifying the different levels at which justice can be addressed and by elaborating the level that restoration practice should aspire to if it is to be just and transformative.

33 **Introduction**

34 Around the world, almost all kinds of ecosystems have been degraded and converted, eroding
35 both the biological and cultural foundations of human wellbeing. It is estimated that the
36 wellbeing of 3.2 billion people has already been adversely affected by land degradation and
37 there are growing concerns for the future food security of all¹. This crisis has driven calls for
38 wide-scale ecological restoration, often as part of biodiversity and climate policy. The United
39 Nations' Decade on Restoration for 2021-2030 pledges to restore a billion hectares of degraded
40 land² and the Kunming-Montreal Global Biodiversity Framework sets a target for 30% of all
41 degraded land to be under restoration by 2030³.

42 Whilst the scale and urgency of global restoration agendas are well-founded, success will
43 depend on how implementation programmes are designed and whether ecological targets are
44 aligned with local social, economic and cultural ones^{4 5}. We are concerned that progress made
45 in gaining global commitments, securing funding, and developing ecological know-how has
46 not been matched by progress in how to meaningfully incorporate social justice into restoration
47 practice. Too often this leads to a superficial consideration of justice, creating unjust
48 interactions and outcomes which impede the effective restoration and protection of both nature
49 and human wellbeing^{6 7}.

50 There has been considerable research to understand the impacts of conservation on
51 Indigenous Peoples and local communities (IP&LCs)⁸ and the interdependencies within socio-
52 ecological, or biocultural, systems that shape the fairness and effectiveness of conservation⁹.
53 Impacts can include displacement, loss of livelihoods, disruption to local institutions and
54 governance, and disrespect for local knowledge and values¹⁰. We are now starting to see
55 evidence of similar impacts arising from restoration itself^{11 12}, making it clear that this sector
56 now requires similar attention to justice as the wider conservation sector.

57 **Approach**

58 Here we develop a typology of justice considerations for restoration practice. We argue for a
59 high level of ambition for justice, presenting a new framework for restoration justice that
60 goes well beyond the Society for Ecological Restoration's call for fully participatory
61 restoration projects that are co-designed with local stakeholders and incorporate local
62 knowledge and cultural values¹³. We commend the reach of this important initiative but we

propose the need for a set of even more fundamental justice concerns (relationships, knowledge systems and structural foundations), to avoid such calls being interpreted in superficial ways. As Shelton et al.¹⁴ conclude, the restoration sector exhibits a shift in discourse without accompanying depth in change to practice. We see this manifested in significant differences between how just restoration is conceived by different actors: agencies designing and implementing large-scale restoration initiatives tend to consider justice in terms of more instrumental practices such as benefit sharing, alternative livelihoods and consultation exercises; whereas Indigenous scholars and civil society organisations tend to also highlight more systemic causes of injustice linked to ecosystem and cultural degradation. Indeed, we observe a chasm in understanding, in which practitioners are accused of failing to address deeper, systemic drivers of injustice, including reluctance to address epistemic injustice (domination of some knowledge systems) or to address historic environmental injustices, including past land disposessions^{11 15 12}.

We argue that deeper relational, epistemic and structural foundations of Just Restoration are what can make justice transformative and thus lead to more sustainable and effective results. We present our typology of approaches and proceed to explain how we associate justice with transformative change. We then elaborate the key elements of the framework with examples of how these can be actionable and contribute to effective restoration outcomes. We hope that this perspective serves as a basis for further debate about how we conceive just and transformative restoration and ultimately as a basis for assessing, reflecting on and adapting practices in ways that arc towards deeper attention to justice, and to addressing underlying drivers of social and ecological degradation.

The need for justice-centred restoration

There is a significant gap between what is considered good practice in global guidelines^{13 16} and what is happening on the ground. Systematic reviews of forest landscape restoration projects have found minimal progress in understanding or addressing the social dimensions of restoration, a tendency towards top-down governance, exclusion of local knowledge, tokenistic approaches to community engagement and a narrow conception of social outcomes limited to economic benefits¹⁴. For example, a review of over 5,000 restoration projects in the USA found a predominant focus on ecological objectives¹⁷. The Just Conservation global database contains 102 cases (out of 648) that relate to restoration initiatives¹⁸. Among those, 31% involved exclusion or low-level consultation of IP&LCs; in a further 30% IP&LCs are

able to participate in only a limited way. IP&LCs could be described as equal partners in 23% of cases and as having primary control in only 16% of cases. Oversimplifying social concerns, by conflating them with economic costs and benefits, excludes many local people¹⁹ and ignores a wider range of potential social impacts^{21 22}. For example, failure to respect local knowledge can result in cultural harm and failure to address drivers of degradation²³.

There is growing evidence that this inadequate attention to social dimensions is undermining ecological outcomes²⁴. Major global reviews have consistently found that restoration is more successful where governance is based around local institutions and leadership^{25 7}. There are 41 restoration cases in the Just Conservation database that provide evidence of ecological outcomes (Fig. 1), showing that higher levels of IP&LC control are associated with positive ecological outcomes. This mirrors the findings for a larger sample incorporating both restoration and conservation interventions (n = 170, ⁷).

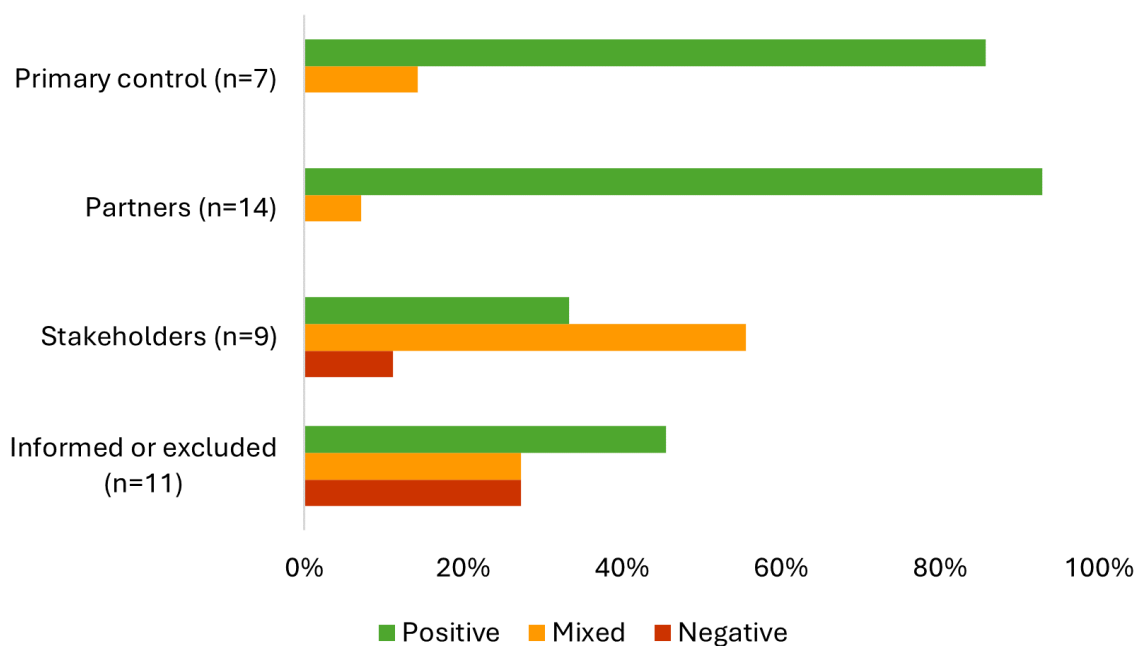


Figure 1. The ecological outcomes of restoration interventions with different levels of community control (n=41). Data from the Just Conservation database (Coolsaet and Dawson 2023).

Findings have also consistently shown that forms of social restoration that revitalise local capacity, authority and connections to more-than-human nature provide important foundations for effective ecological restoration^{26 27 12 28}. For example, a systematic review of rangeland restoration in southern Africa found that integrating local and Indigenous

knowledge and empowering marginalized groups significantly strengthens governance and leads to more sustainable restoration outcomes²⁹.

Broadly speaking, we take this evidence to suggest that if restoration is to be transformative (of the ecological crisis) it needs to centre core aspects of justice, including decision-making procedures, distribution of costs and benefits, and recognition of local knowledge. Our focus now is on how this can be done robustly, going beyond superficial interpretations.

Levels of justice in restoration practice

Our proposed solution involves developing a novel framework that integrates systems understandings of transformative change with multi-dimensional conceptions of environmental justice. We combine these to develop a typology of restoration approaches, which integrate justice to varying degrees, present key criteria for distinguishing them and exemplify ways in which just and transformative restoration can be implemented.

Systems models of transformation are commonly based on multiple levels of system-wide change. Key examples include the ‘iceberg’ model and the ‘leverage points’ model, both of which imagine social-ecological systems as consisting of multiple, interconnected levels. The ‘shallow’ level (e.g. tip of the iceberg) consists of easily observable phenomena or symptoms (such as degraded forest) and operational management practices (such as the design of a reforestation project). Underlying this operational level are progressively deeper and systemic roots that produce these surface level phenomena and trends, for example the underlying institutions, knowledge and values that shape dominant models of restoration practice. We build on a ‘leverage points’ model that proposes different levels of system intervention³⁰: shallow intervention points include changes to operational parameters such as financial incentives; deeper intervention points address system ‘design’, such as the institutions (financial, legal etc) that shape decision-making in ways that produce regular patterns of behaviour; the deepest intervention points seek to shift the ‘intent’ of the system by changing mental models (or ‘views’) and the goals (or intent) of society, as well as the power to influence these³¹.

This systems perspective on transformative change is well established in the sustainability literature³², but efforts to integrate justice agendas (i.e. for ‘just transformations’) are less well developed. We address this by introducing a commonly used categorisation of three interrelated dimensions of environmental justice: distribution, procedure and recognition³³. Distributive justice concerns the distribution of the harmful impacts of environmental degradation as well

as the benefits and burdens arising from restoration. Procedural justice is concerned with equity, diversity and inclusion in decision-making procedures, both for human and other-than-human subjects. Recognition justice concerns the status afforded to different justice subjects (humans, ancestors, rivers etc), including their diverse knowledge and values, addressing deep-lying prejudices such as racism, coloniality and speciesism.

These different dimensions of justice have not been explicitly linked to different system levels (different leverage points). However, a multi-level reading of justice dimensions is often implicit in environmental justice analysis. For example, the environmental justice movement grew out of protests against the unfair distribution of toxic pollutants in the US. The focus was initially on observing unfair distributions of toxic waste, but it became clear that it was necessary to address underlying causes. Firstly, ill-distribution could not be resolved without addressing the procedural injustices that proliferated unfair decisions, including weak political representation in affected communities. Secondly, procedural bias was itself seen to be founded on failures of recognition – status inequalities manifesting in institutional racism and coloniality³⁴.

Our primary purpose for combining these two frameworks is to highlight that justice dimensions can themselves be addressed at different levels. Critically, to be transformative, justice will ultimately need to be addressed at ‘deeper’ levels. We can illustrate how leverage points and environmental justice framings offer complementary insights about global restoration strategies through an example of how operational level decisions about ‘what land to restore’ can be shaped by deeper lying values and intent. The global restoration priority map operationalises the intent that restoration should prioritise cost-effective biodiversity and carbon storage gains³⁵. Whilst such exercises are intended to be evidence-based and neutral, they are inherently normative, with significant (in)justice outcomes if acted upon³⁶. In this case, the vast majority of land prioritised for restoration falls in the tropics, in some cases representing the majority of a nation’s agricultural land³⁶. Such mapping exercises construct and communicate an intent for land in the mind, in ways that pave the way for operational control over it on the ground³⁷. The intent is shaped by particular ways of knowing and valuing how land should be used, and through the power relations that enable this intent to prevail. Dominant ways of knowing and valuing restoration interventions serve to identify particular forms and locations for restoration as technically and morally superior. A just transformation to restoration ultimately needs to engage with such complex connections across system levels.

Environmental injustices are always linked to asymmetries in power. Dominant ways of knowing and valuing nature are associated with ideologies and interests of more powerful groups and nations and these are inscribed into the political, economic and discursive frameworks that ‘structure’ everyday environmental decision making³⁸. Working within existing power configurations will reproduce dominant institutional relationships and dominant paradigms of both human-human and human-nature relationships, rather than promoting equity, diversity and inclusivity in the knowledge and values that inform restoration practice. Deeper levels of intervention in social-ecological systems therefore require progressively confronting power^{39 32}. This includes: more visible forms of power embedded in economic and political institutions; less visible forms of power whereby ‘backstage’ actors set agendas, for example limiting solution framing to operational parameters; and invisible, discursive forms of power through which dominant worldviews, values and knowledge about restoration are often subconsciously reproduced⁴⁰.

For restoration to be just and transformative it needs to expand its practices across all system levels and dimensions of justice and power. This is not to say that operational level interventions are necessarily ineffective but rather that they will not be effective unless connected to interventions at deeper levels^{41 31}. We suggest that this analysis holds true for justice: addressing distributional, procedural and even recognitional justice at a purely operational level can only yield superficial results and will reproduce power inequality and underlying causes of injustice. We have a particular concern that current efforts to refashion restoration as e.g. ‘respecting Indigenous Peoples’ are often restricted to operational level treatment of justice, in particular superficial forms of participation and benefit sharing that fall short of the requirements to deliver transformative change.

Our typology combines system levels and justice dimensions into a single spectrum of practices (Fig. 2). We distinguish four general types of restoration approach (exclusionary, managerial, collaborative, and just and transformative). However, this is not a simple or linear typology, We provide a generalisation below but there are interactions across multiple scales and between numerous actors that characterise restoration practice and which require attention or even transformation to enable shifts towards a more just restoration approach. As we will see below (e.g. the Fandriana Marolambo restoration program in Madagascar), there are cases in which collaborative restoration approaches already in place can function as leverage points to move towards transformative restoration.

Towards Just and Transformative Restoration

Shifting to high-level integration of social justice and ecological restoration.



Figure 2: Typology of approaches for integrating social justice concerns into restoration practice

At the lowest level (exclusionary), restoration approaches disregard social concerns, adopting a narrow, ecological reference point as their vision for restoration, and thus conceptually and/or materially segregating IP&LCs from ecosystems and governance. Attention to justice is not integral to design although claims of injustices might be addressed reactively where implementation is affected. At the second level (managerial), operational level social justice concerns are addressed, but in primarily shallow ways in isolation from key decisions about what to restore and how. Typical actions include more tokenistic forms of participation (invited consultation), compensation schemes, benefit-sharing incentives and ‘alternative livelihoods’¹⁰ (Martin 2017). As previously evidenced, limiting change to these operational levels of design often fails to produce desired social or ecological outcomes. At the third level (collaborative),

restoration addresses institutional conditions for meaningful partnerships that respect rights, territories, customary institutions, and cultural norms. However, these may be viewed as co-benefits or achieved through safeguards and side processes, while ecological aims and western scientific knowledge ultimately still dominate. Alternative epistemologies and ontologies or restoration may not be recognised or respected, including biocultural conceptions of an inextricable link between cultural and biological diversity.

The fourth level (just and transformative) is distinguished by commitment to address the systemic foundations for just restoration which includes particular attention to elements of recognitional justice and forms of power that are linked to the domination of particular intentions and paradigms for restoration. Fig. 2 identifies three main foundations of just and transformative restoration: i) relationships, ii) knowledge systems and iii) structures.

The relational foundation for just restoration aligns with an emerging view that transformation to sustainability requires a paradigmatic shift from dualistic to relational cognition of nature⁴². Here, we are concerned with the recognition of relational values, defined as meaningful relationships with nature or relationships among humans that are enabled through nature. Introducing this ‘relational turn’ to restoration is of huge practical significance. Firstly, it reflects the diverse ways in which IP&LCs value nature bioculturally, as co-constituted through identity, place, territory and livelihoods⁴³. Secondly, recognising such relationality radically reframes restoration - away from dualistic cognition of ‘ecological’ restoration for ‘societal’ benefit, and towards restoration of both human-nature relationships and the human-human relationships that are co-constituted with these. In other words, restoration takes on an agenda of reconnection, with transformation underpinned by an ethic of care towards nature and between humans. Included here is the need to repair harms arising from the use of more-than-human nature, and helping those that have been victims of structural or cultural violence to heal or recover their sense of dignity.

The knowledge foundation for just restoration requires meaningful recognition of diverse forms of Indigenous and local knowledge (ILK), not only to advance human rights but also for enriched understanding of e.g. what to restore and how. Despite enormous diversity worldwide, much ILK is marginalised, for example due to incommensurability with dominant development ideologies or scientific paradigms⁴⁴. This evolving knowledge system monoculture is not only unjust, but also a constraint on sustainability, for example because it forecloses on relational ethics of care. In practice, being receptive to a pluriversal knowledge foundationⁱ implies a

significant extension of the sphere of restoration - recognising the salience of ILK but also sometimes the need for restoring ILK and of restor(y)ing restoration⁴⁵. Cultural erosion is a normal outcome of ongoing processes of epistemic violence, thus helping to restore ILK is often a necessary part of just restoration practice.

The structural foundation for just restoration addresses the formal and informal institutional arrangements which render power asymmetries visible and widely impactful. Institutional rules and norms serve to enact the interests, values and knowledge of some actors but not others. Institutions that shape control over land are, among others, crucial for restoration, often reflecting political and economic intent in ways that enable land dispossession, marginalise small farmers or threaten the territorial rights and sovereignty that are known to be associated with effective conservation/restoration practice^{7 24}). The structural foundations of just restoration require attention to wider contexts and especially to identify institutional reforms that can disrupt these conduits for power inequality, including prevailing norms and goals related to use of land.

We propose this typology as a heuristic device for learning about the gap between narrower, managerial conceptions of justice that are entering into restoration guidelines, and more foundational ideas of justice appearing in political ecology literature⁴⁶. We realise that going far beyond justice as participation and benefit sharing – seeing restoration through the eyes of critical and relational social sciences – is a significant challenge for restoration practice. It might require opening up to alternatives to conservation biology as the sole knowledge for determining what should be restored. For example, recognising biocultural worldviews can be challenging because the underpinning relationality does not separate ecological restoration from struggles to oppose cultural homogenisation, to heal social relationships with more-than-human nature, to restore languages and knowledge systems, and to assert rightful authority over lands and territories⁹. Such a biocultural perspective entails confronting the deeper power asymmetries that cause injustice in people's relationship with more-than-human nature, which in many cases precede the restoration efforts as such.

Just and Transformative Restoration

Although the highest level of our typology can require some profound changes in practice, there are increasing numbers of case studies that demonstrate this to be an actionable agenda. The practices observed in these cases are clearly distinct from mainstream approaches to

restoration justice, most notably due to engagement with the relationships, knowledge systems, and structures that are foundational for just restoration. It is noteworthy that most of these cases involve Indigenous Peoples. This might partly reflect the levels of exposure to land degradation faced by IPs and the contribution to global restoration by IPs²⁵, but also national and international requirements to respect the rights, livelihoods, autonomy and cultures of IPs. As a result, cases involving IPs provide a repository of ‘bright spots’ of restoration practice that we think can be adapted for working with host communities more generally.

Relational foundation for just restoration

There is enormous diversity in how IP&LCs value nature, but recent work highlights widespread significance of reciprocal dependencies and kinship relationships with more-than-human nature⁴⁷. Such relationships have long been acknowledged as important in the governance and management of cultural heritage⁴⁸, climate change adaptation and mitigation⁴⁹ and increasingly in biodiversity conservation⁵⁰. It is unfortunate that their role in restoration planning remains limited because there is growing evidence that this can contribute to successful outcomes.

Methods have been tested for bridging ontological differences between partners, ensuring relational values are incorporated into restoration design^{15 51}) and into more holistic indicators of social-ecological outcomes, including wellbeing⁵². Studies of beaver, elk and condor recovery projects find that applying methods that recognise relationality can strengthen motives for stewardship, delivering justice for both people and wildlife²⁸. Major global reviews of evidence have confirmed that incorporating relational values should (and can) be a priority for the long-term effectiveness of nature conservation^{44 32}.

To provide one indicative example of how this is being done, Kelp forest restoration initiatives in the Haida Gwaii archipelago of British Columbia have involved local partnership with conservation scientists. A key foundation has been a preliminary participatory process to identify local values which are then incorporated into the design of interventions. This process has rendered local relational values visible from the outset, helping to bring constructive coexistence between international conservationist and local community visions of sustainability. A set of six local values were identified and these underline the importance of the relational: Respect, Responsibility, Interconnectedness, Balance, Seeking Wise Council, and Giving and Receiving⁵³.

Knowledge foundation for just restoration

Indigenous and local knowledge (ILK) systems represent holistic sets of cultural values, established customary institutions and traditional practices for governing and managing land and seascapes. ILK systems vary greatly but are commonly distinct from western scientific knowledge systems and are not always recognised or integrated in formal governance structures⁵⁴. There has been increasing acknowledgement of the importance of ILK in conserving biodiversity^{26 7} and restoring landscapes²⁵. This recognition is now enshrined in key international agreements such as the Convention on Biological Diversity³ and UNFCCC⁴⁹.

Many initiatives involving IP&LCs remain at our managerial level: selectively integrating pieces of local knowledge into Western scientific framings or simply treating IP&LCs as stakeholders to be informed, consulted or incentivised. However, there are now established good practices for more transformative knowledge practices, and tools to support, e.g. for respecting customary tenure and co-designing restoration approaches around them⁵⁵. ‘Community biocultural protocols’, territorial life plans or cultural mapping can provide locally-generated resources to promote recognition and intercultural collaboration. Approaches to restoration that recognise and promote place-based knowledge systems have been shown to provide the justice foundation for effective governance, shared vocabularies for future visions and better quality understanding of the drivers of degradation and the system trade-offs that require negotiation⁴.

An indicative example can be seen in New Ireland, Papua New Guinea. Indigenous scientists, community Elders and international academics developed a locally-oriented approach to restoring fisheries using “indigenous epistemology-based marine resource management”⁵⁶. This draws on scientific knowledge, including ecological knowledge and sustainable harvesting regimes but, importantly, it orients restoration around Indigenous worldviews through culturally specific priorities based on harmonious relationships between living persons, spirits and ancestors, all of which are understood as intimately connected to the health and governance of the marine system. This integration of sustainability science with Indigenous ontology and epistemology is expected to lead to more effective and durable marine conservation.

Structural foundations for just restoration

In many cases, to enable IP&LCs to gain authority over restoration, wider contextual change is required, both to the high-level institutions (norms and rules/laws), policies and funding flows that ‘structure’ dominant restoration practices. For IP&LC groups to be able to act upon preferred relationships with more-than-human nature, or upon place-based knowledge of social-ecological systems, they require power to influence restoration decisions at all stages⁵⁷. Restoration efforts led by external actors that hold the resources and set the agendas for restoration are often viewed by IP&LCs as vehicles for replicating prevailing unequal power relations.

Bringing about structural change to power relations is not always possible for conservation and restoration practitioners. However, there is a growing body of good practice cases that have tested methods for analysing power relations, communicating power relations and acting on power asymmetries. Sometimes described as decolonial models of restoration, tools to analyse and address power relations are found to support effective outcomes, notably through a resurgence in local capacity for restoration. This is seen in many contexts, such as forest restoration²⁶, wildlife recovery⁵⁸, recovery of mining landscapes¹² and urban ecological restoration²⁷. Such case-level evidence aligns with larger synthesis studies^{20 25}. Direct funding to IP&LCs is also becoming more feasible with recent international commitments and dedicated funds⁵⁹.

An indicative example can be seen in the Fandriana Marolambo forest landscape restoration program in Madagascar. Initially led by WWF with a managerial level of community consultation, it quickly became evident that success would require a restructuring towards local ownership and stewardship. This required changes to institutions that reflected unequal power over resources. In particular, reforms to tenure rules to recognise local customary forest tenure and change to laws that prohibited shifting cultivation. This reshaped the whole project, with an initial stage being required to enable communities to help design the project. It is important to note that this did triple the time scale of the project but in doing so provided a pathway to long term success, which eventually included a formal handover from WWF to local communities⁶⁰. Revitalising local control and capacity may increase start-up costs but can reduce transactions costs (e.g. of guarding tree plantations) in the longer-term.

Applying the typology

The novel contribution of our typology is in large part generated through the intersection between a multi-level systems approach and a multi-dimensional justice approach. This perspective is based on an extensive review of knowledge, although its application remains at proof-of-concept stage. For example, we recently trialled this through a locally facilitated, two-day national workshop on just restoration in Liberia. This included using a version of Fig. 3 as a prompt for participants to i) assess the current situation in national restoration practice and ii) to begin participatory visioning for just restoration. This experience strengthened our view that the four-level typology has a useful and actionable application, as an analytical framework for assessing current practice, as heuristic for exploring future aspirations, and for identifying systemic opportunities and barriers to progress.

4 levels of Environmentally Just Restoration	 Exclusionary	 Managerial	 Collaborative	 Transformative
 DISTRIBUTIONAL JUSTICE	Local people do not benefit but pay the costs.	Some provision of benefits to offset costs to community.	Joint identification of costs to be addressed and design of access and distribution rules.	Addressing root causes of unfair distribution of harms and benefits from restoration.
 PROCEDURAL JUSTICE	Restoration imposed with no participation.	Tokenistic participation after restoration objectives and methods are fixed.	Co-design and co-governance of restoration projects.	Local design and primary control of restoration through local institutions.
 RECOGNITION JUSTICE	Local knowledge and values are not considered relevant.	Tokenistic consideration of local culture and knowledge.	Some respect for and promotion of local rights, values and knowledge.	Addressing root causes of poor recognition and restoring local institutions and knowledge.

Figure 3. Application of typology for assessment of different dimensions of justice

Outlook

Due to the bleak long-term trajectory for ecosystem health, the reversal of degradation and restoration of the world's ecosystems have become policy goals at global, regional and national levels. Ambitious short to medium-term targets have been set and resources are being directed towards programs to implement them. However, the performance of restoration projects often

falls short of ambitions and attention has turned to how we can bring about transformative change towards sustainability. One area of emerging agreement is that transformative change needs to pursue justice in tandem with sustainability. However, our knowledge about how to achieve this, and the practical and economic implications of reorienting restoration approaches, remains thin.

Attention to justice (across all dimensions) is too often confined to project-level managerial approaches without due attention to more systemic causes. Global standards of practice provide necessary guidance but do not currently articulate the depth of change required for transformative practice. They include social standards for the engagement and sharing of benefits, but these become framed as managerial-level parameters to be addressed at a project level. There is limited recognition that fair distribution and meaningful participation are often conditional on more profound shifts to systems of knowledge, values and structures that shape dominant approaches to restoration. By contrast, IP&LCs often employ more holistic framings of the long-term dynamics of restoration in which ecological and social dimensions of degradation and restoration are profoundly interdependent. At a theoretical level, such a biocultural perspective on nature-society relations is reflected in contemporary restoration ecology, in which the modernist notion of nature and society as separate and in opposition is widely rejected in favour of social-ecological systems perspectives⁴². But in practice, separated ecological objectives continue to dominate models of restoration practice¹⁷ and we find the typology to be an effective way to stimulate dialogue about this apparent barrier to justice and sustainability.

Our argument here focuses on that critical nuance between reproducing similar practices and results and instead shifting efforts towards the just and transformative end of the spectrum (Fig. 2, Fig. 3). Specifically, designing and implementing transformative restoration projects requires a reorientation of focus to the relationships, knowledge systems and structures that are foundational to restoration practice. There are increasing numbers of ‘bright spots’ of just and transformative restoration. Nurturing such innovative local practice is necessary but will only be part of the solution. To mainstream just restoration, change is also needed to dominant models of practice - what socio-technical transitions theorists refer to as shifting the regime⁴¹ - through more explicit justice guidelines for state and INGO restoration funders and implementers.

Competing interests

The authors declare no competing interests.

Contributions

A.M. led the writing. IR, ND, RB and IC contributed to literature review, analysis and writing.

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Figure 1. The ecological outcomes of restoration interventions with different levels of community control (n=41). Data from the Just Conservation database¹⁸. (Green = Positive, Amber = Mixed, Red = Negative)

Figure 2: Typology of approaches for integrating social justice concerns into restoration practice

Figure 3. Application of typology for assessment of different dimensions of justice

1. Právělie, R. Exploring the multiple land degradation pathways across the planet. *Earth-Sci. Rev.* **220**, 103689 (2021).

2. UNEP. *Ecosystem Restoration for People Nature and Climate*.
<https://www.unep.org/resources/ecosystem-restoration-people-nature-climate>.

3. CBD. *Kunming-Montreal Global Biodiversity Framework*. <https://www.cbd.int/gbf/> (2022).

4. Tedesco, A. M. *et al.* Beyond ecology: ecosystem restoration as a process for social-ecological transformation. *Trends Ecol. Evol.* **38**, 643–653 (2023).

5. Benra, F. *et al.* National ecosystem restoration pledges are mismatched with social-ecological enabling conditions. *Commun. Earth Environ.* **5**, 731 (2024).

6. Obura, D. The Kunming-Montreal Global Biodiversity Framework: Business as usual or a turning point? *One Earth* **6**, 77–80 (2023).

7. Dawson, N. M. *et al.* Is it just conservation? A typology of Indigenous peoples' and local communities' roles in conserving biodiversity. *One Earth* **7**, 1007–1021 (2024).

8. West, P & Brockington, D. An Anthropological Perspective on Some Unexpected Consequences of Protected Areas. *Conserv. Biol.* **20**, 609–618 (2006).

9. Rozzi, R. Biocultural Conservation and Biocultural Ethics. in *From Biocultural Homogenization to Biocultural Conservation* (eds Rozzi, R. *et al.*) vol. 3 303–314 (Springer International Publishing, Cham, 2018).

- 464 10. Martin, A. *Just Conservation: Biodiversity, Wellbeing and Sustainability*. (Routledge, 2017).
465 doi:10.4324/9781315765341.
- 466 11. Anguelovski, I. & Corbera, E. Integrating justice in nature-based solutions to avoid nature-
467 enabled dispossession. *Ambio* **52**, 45–53 (2023).
- 468 12. Urzedo, D., Pedrini, S., Hearps, C., Dixon, K. & Van Leeuwen, S. Indigenous environmental
469 justice through coproduction of mining restoration supply chains in Australia. *Restor. Ecol.* **30**,
470 e13748 (2022).
- 471 13. Gann, G. D. *et al.* International principles and standards for the practice of ecological
472 restoration. *Restor. Ecol.* **27**, S1–S46 (2019).
- 473 14. Shelton, M. R., Kanowski, P. J., Kleinschmit, D. & Ison, R. L. Critical social perspectives in
474 forest and landscape restoration – a systematic review. *Front. Environ. Sci.* **12**, 1466758 (2024).
- 475 15. Champion, O. B. *et al.* Balpara: a practical approach to working with ontological difference in
476 indigenous land & sea management. *Soc. Nat. Resour.* **37**, 695–715 (2024).
- 477 16. FAO, SER, & IUCN. *Standards of Practice to Guide Ecosystem Restoration. A Contribution to*
478 *the United Nations Decade on Ecosystem Restoration. Summary Report*. (2023).
- 479 17. Jurjonas, M. *et al.* The perceived ecological and human well-being benefits of ecosystem
480 restoration. *People Nat.* **6**, 4–19 (2024).
- 481 18. Coolsaet, B & Dawson, N. *Just Conservation - Global Data of Site-Level Biodiversity*
482 *Conservation and Its Social-Ecological Outcomes*. <https://doi.org/10.5281/zenodo.7688777> (2023).
- 483 19. Kandel, M., Agaba, G., Alare, R. S., Addoah, T. & Schreckenberger, K. Assessing Social Equity in
484 Farmer-Managed Natural Regeneration (FMNR) Interventions: Findings from Ghana. *Ecol. Restor.* **39**,
485 64–76 (2021).
- 486 20. Löfqvist, S. *et al.* How Social Considerations Improve the Equity and Effectiveness of
487 Ecosystem Restoration. *BioScience* **73**, 134–148 (2023).
- 488 21. Elias, M., Joshi, D. & Meinzen-Dick, R. Restoration for whom, by whom? A feminist political
489 ecology of restoration. *Ecol. Restor.* **39**, 3–15 (2021).
- 490 22. McElwee, P. & Huu Nghi, T. Assessing the Social Benefits of Tree Planting by Smallholders in
491 Vietnam: Lessons for Large-Scale Reforestation Programs. *Ecol. Restor.* **39**, 52–63 (2021).
- 492 23. Almassi, B. Ecological restorations as practices of moral repair. *Ethics Environ.* **22**, 19–40
493 (2017).
- 494 24. Mansourian S *et al.* *Human Dimensions of Forest Landscape Restoration*. 76
495 <https://hdl.handle.net/10568/141866> (2024).
- 496 25. Reyes-García, V. *et al.* The contributions of Indigenous Peoples and local communities to
497 ecological restoration. *Restor. Ecol.* **27**, 3–8 (2019).
- 498 26. Artelle, K. A. *et al.* Supporting resurgent Indigenous-led governance: A nascent mechanism
499 for just and effective conservation. *Biol. Conserv.* **240**, 108284 (2019).
- 500 27. Hall, M. M. *et al.* Promoting social and environmental justice to support Indigenous
501 partnerships in urban ecosystem restoration. *Restor. Ecol.* **29**, e13305 (2021).

- 502 28. Martinez, D. J., Cannon, C. E. B., McInturff, A., Alagona, P. S. & Pellow, D. N. Back to the
503 future: Indigenous relationality, kincentricity and the North American Model of wildlife
504 management. *Environ. Sci. Policy* **140**, 202–207 (2023).
- 505 29. Slayi, M., Zhou, L., Thamaga, K. H. & Nyambo, P. The Role of Social Inclusion in Restoring
506 Communal Rangelands in Southern Africa: A Systematic Review of Approaches, Challenges, and
507 Outcomes. *Land* **13**, 1521 (2024).
- 508 30. Meadows, D. *Leverage Points: Places to Intervene in a System*. (1999).
- 509 31. Abson, D. J. *et al.* Leverage points for sustainability transformation. *Ambio* **46**, 30–39 (2017).
- 510 32. IPBES. *Summary for Policymakers of the Thematic Assessment Report on the Underlying*
511 *Causes of Biodiversity Loss and the Determinants of Transformative Change and Options for*
512 *Achieving the 2050 Vision for Biodiversity*. (2024).
- 513 33. Schlosberg, D. Reconceiving Environmental Justice: Global Movements And Political
514 Theories. *Environ. Polit.* **13**, 517–540 (2004).
- 515 34. Bullard, R. D. *Dumping in Dixie: Race, Class, and Environmental Quality*. (Routledge, 1990).
- 516 35. Strassburg, B. B. N. *et al.* Global priority areas for ecosystem restoration. *Nature* **586**, 724–
517 729 (2020).
- 518 36. Schultz, B. *et al.* Recognizing the equity implications of restoration priority maps. *Environ.*
519 *Res. Lett.* **17**, 114019 (2022).
- 520 37. Li, T. M. What is land? Assembling a resource for global investment. *Trans. Inst. Br. Geogr.*
521 **39**, 589–602 (2014).
- 522 38. Vatn, A. *et al.* Incorporating diverse values of nature in decision-making—theory and
523 practice. *Philos. Trans. R. Soc. B Biol. Sci.* **379**, 20220315 (2024).
- 524 39. Geels, F. W. Regime resistance against low-carbon transitions: introducing politics and
525 power into the multi-level perspective. *Theory Cult. Soc.* **31**, 21–40 (2014).
- 526 40. Gaventa, J. Finding the spaces for change: a power analysis. *IDS Bull.* **37**, 23–33 (2006).
- 527 41. Kanger, L., Sovacool, B. K. & Noorköiv, M. Six policy intervention points for sustainability
528 transitions: A conceptual framework and a systematic literature review. *Res. Policy* **49**, 104072
529 (2020).
- 530 42. West, S., Haider, L. J., Stålhammar, S. & Woroniecki, S. A relational turn for sustainability
531 science? Relational thinking, leverage points and transformations. *Ecosyst. People* **16**, 304–325
532 (2020).
- 533 43. Himes, A. *et al.* Why nature matters: A systematic review of intrinsic, instrumental, and
534 relational values. *BioScience* **74**, 25–43 (2024).
- 535 44. IPBES. *Methodological Assessment of the Diverse Values and Valuation of Nature: Summary*
536 *for Policy Makers*. (2022).
- 537 45. Rodriguez, I. Restor(y)ing the Past to Envision an ‘Other’ Future: A Decolonial Environmental
538 Restorative Justice Perspective. in *The Palgrave Handbook of Environmental Restorative Justice* (eds

- 539 Pali, B., Forsyth, M. & Tepper, F.) 531–561 (Springer International Publishing, Cham, 2022).
540 doi:10.1007/978-3-031-04223-2_21.
- 541 46. Osborne, T. *et al.* The political ecology playbook for ecosystem restoration: Principles for
542 effective, equitable, and transformative landscapes. *Glob. Environ. Change* **70**, 102320 (2021).
- 543 47. Escobar, A. *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making*
544 *of Worlds*. (Duke University Press, 2018).
- 545 48. Rössler, M. World Heritage cultural landscapes: A UNESCO flagship programme 1992 – 2006.
546 *Landsc. Res.* **31**, 333–353 (2006).
- 547 49. Orlove, B. *et al.* Placing diverse knowledge systems at the core of transformative climate
548 research. *Ambio* **52**, 1431–1447 (2023).
- 549 50. Verschuuren, B. *et al.* *Cultural and Spiritual Significance of Nature: Guidance for Protected*
550 *and Conserved Area Governance and Management*. (IUCN, International Union for Conservation of
551 Nature, 2021). doi:10.2305/IUCN.CH.2021.PAG.32.en.
- 552 51. Bartlett, C., Marshall, M. & Marshall, A. Two-eyed seeing and other lessons learned within a
553 co-learning journey of bringing together indigenous and mainstream knowledges and ways of
554 knowing. *J. Environ. Stud. Sci.* **2**, 331–340 (2012).
- 555 52. Biedenweg, K., Harguth, H. & Stiles, K. The science and politics of human well-being: a case
556 study in cocreating indicators for Puget Sound restoration. *Ecol. Soc.* **22**, art11 (2017).
- 557 53. Lee, L. C. *et al.* Chiixuu Tll iinasdll: indigenous ethics and values lead to ecological restoration
558 for people and place in Gwaii Haanas. *Ecol. Restor.* **39**, 45–51 (2021).
- 559 54. Brondízio, E. S. *et al.* Locally based, regionally manifested, and globally relevant: Indigenous
560 and local knowledge, values, and practices for nature. *Annu. Rev. Environ. Resour.* **46**, 481–509
561 (2021).
- 562 55. Larson, A. *Toolbox: Understanding and Addressing Tenure in Forest Landscape Restoration in*
563 *Community Lands*. (2024).
- 564 56. Aini, J. *et al.* Reimagining conservation practice: Indigenous self-determination and
565 collaboration in Papua New Guinea. *Oryx* **57**, 350–359 (2023).
- 566 57. Fox, C. A., Reo, N. J., Fessell, B. & Dituri, F. Native American tribes and dam removal:
567 restoring the Ottaway, Penobscot and Elwha Rivers. *Water Altern.* **15**, 31–55 (2022).
- 568 58. Schneider, L. Decolonizing conservation? Indigenous resurgence and buffalo restoration in
569 the American West. *Environ. Plan. E Nat. Space* 25148486221119158 (2022).
- 570 59. Hill, R. *et al.* Community-based approaches to biodiversity finance. *Curr. Opin. Environ.*
571 *Sustain.* **73**, 101521 (2025).
- 572 60. Ranjatson P & Razafimahatratra A. *Lessons in Adaptive Governance of Complex Social*
573 *Ecological Systems: Long Term Experiences from the Fandriana Marolambo Forest Landscape*
574 *Restoration, Madagascar*.

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ⁱ Here we adopt the concept of 'pluriversality' because it clearly implies the coexistence of multiple worlds. The alternative term 'plural' is commonly used but may be (mis)construed as referring to multiple perspectives within a shared (dominant) world or worldview.