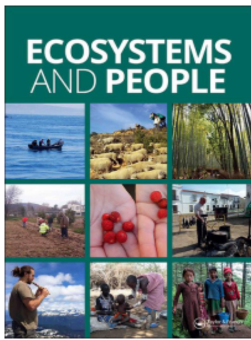

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Indigenous justice frameworks for relational ethics in land-based design

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ABSTRACT

In the face of systematic expropriation, massive biodiversity loss, and the ongoing climate crisis, Indigenous peoples, knowledge, and labor have protected over 80% of the global biodiversity. This is remarkable given that Indigenous management or tenure remains over 20–25% of the planet's terrestrial surface. Indigenous people's capacity to protect biodiversity within their territories cannot be separated from the ethical frameworks that shape their relationships with land. These frameworks have been articulated by a diverse array of Indigenous scholars across the globe, and while they cannot be generalized, many share principles that go beyond dominant Western Scientific approaches that normalize utilitarian or idealized (e.g. ideals of wilderness) ethical systems. We argue that dominant policy and research discourses around land-based practices such as nature-based solutions and green infrastructure, will not be effective 'solutions' to ongoing crises of climate change and biodiversity loss. Instead, we must go beyond paradigms of improvement and anthropocentric utility and ground land-based practices in the paradigm of relational ethics. Through this perspective paper, we argue that rather than seeking solutions through redesigning ecosystems for utilitarian reasons, all interventions on Indigenous ancestral lands (recognized by settler states or not) should first center relational ethical approaches for land-based design practices and ground efforts in Indigenous justice. Our proposed 'Indigenous Justice Frameworks for Relational Ethics in Land-based Design' is based on the inseparability of bodies, lands, and knowledges, and is guided by the following elements: (1) generative refusal, (2) centering healing, reparation, and right relations, and (3) restoring and evolving Indigenous governance.

KEY POLICY HIGHLIGHTS

- Paradigm shifts are necessary for land-based design practices to honor the interdependence of human well being and the health of land.
- Current global initiatives to transform land-based design practices stand to reinforce problematic human–nature relations.
- Existing, resurgent, and emergent relational ethical frameworks from Indigenous communities and scholars can guide land-based design toward necessary reciprocity.

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1. Introduction

Land-based design practices, or the ways in which we define appropriate relationships including use (e.g cultivation, harvest), transformation (e.g. clearance, terracing), and built development (e.g. roads, trails, buildings), are the foundation of human well-being and all economic activity. Currently dominant strains of environmental ethics draw upon utilitarian and pragmatic principles, reinforcing nature-culture dualisms and often siloing land-based design practices through concepts such as 'wilderness', 'highest and best use' and 'compensatory mitigation' (O'Connor 2022). At present, major research and policy approaches including nature-based solutions (NbS) and related concept of green infrastructure (GI), have the potential to reinforce these logics which allow for ecological sacrifice zones and areas targeted for restoration via technocratic, state-centric, and colonial regimes of governance (Domínguez and Luoma 2020).

Major approaches for designing and implementing diverse landscape interventions – such as urban and rural tree planting, coastal and river ecosystem restoration, green roofs – focus on delivering specific biophysical functions, including stormwater runoff, flood management, and heat mitigation while providing other forms of social utility such as improved aesthetics and supporting food production (Raymond et al. 2017). While seemingly harmless and even beneficial, these current pushes towards large scale restoration of 'nature' have been critiqued and rejected by Indigenous communities subjected to

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them on several fronts (Domínguez and Luoma 2020; Rees et al. 2023). At the heart of these rejections are differences in worldviews and accompanying ethical frameworks guiding right relations between humans, ecosystems, and the earth.

Here we examine the guiding ethical paradigms and systemic relationships of dominant land-based design practices and argue for a Indigenous justice framework that centers the deeper transformations necessary to honor Indigenous relations with place. In the context of this article, 'Indigenous justice' refers to the holistic philosophy guided by customary laws, traditions, and practices that are mainly taught through examples and oral instructions from community elders (Melton 1995). It includes revealing problems, discussing them as a community, making amends, and restoring relationships with human and non-human entities (Tso 1989). This means that while there is some component of just reparations needed from settler colonial institutions, the terms of those processes must be defined on Indigenous terms.

Some scholars have argued for the conceptual connections between 'Indigenous justice' and 'restorative justice' (Melton 1995; Hand et al. 2012). Both terms consist of reconstituting harmony with special focus on identifying the reasons why the harmony was disrupted and how it could be restored (Yazzie 1993) as opposed to achieving justice through punishment. To achieve that harmony, relational dynamics must be restored because within Indigenous worldviews, it is only through relationships that one can heal and repair the harm done. Hence, our focus on relationality and refusal of extractive relationships.

Throughout this publication we argue that rather than seeking solutions through techniques for the utilization of nature, we should first center relational ethical approaches for land-based design practices and ground our efforts in Indigenous justice. In support of this argument, we present Section 1 as a review of Indigenous scholarship on relational ethics to familiarize readers with foundational concepts. In Section 2 we contrast the relational ethical approach with the paradigms guiding current NbS, GI, and state-led large scale 'greening' initiatives practice. Finally, in Section 3 we present a framework for embedding Indigenous justice into land-based design practices.

The 'Indigenous Justice Frameworks for Relational Ethics in Land-based Design' is grounded in the inseparability of bodies, lands and knowledges and is guided by the following elements: A) generative refusal, centering the material and spiritual needs of a community while refusing colonialism (Simpson 2017), B) centering healing, reparation and right relations, and C) restoring and evolving Indigenous governance. Given that these three dimensions are all interdependent, we do not present this framework as a simple 'adaptive management' cycle, but more as three interrelated dimensions of land-based relational design thinking and practice that are unified by the spirit of right and reciprocal relations with creation.

By embodying relational ethics in specific practices of design we aim to move towards design thinking that aligns with more than human needs, works with the condition of the land, syncs ecological cycles with human processes, and ultimately enables systemic transformations of the social-ecological-technological systems of everyday life. Through this framework we hope to guide students and practitioners in architecture, urban design and planning, landscape architecture, urban ecology, and urban sustainability towards anti-colonial actions and ethical governance transitions. We conclude with a brief discussion of how this framework can inform current design policy and practices. With this we wish to inspire scholars, students, activists, and others working at the interface of society and ecosystems to rethink their ethical standpoints and act from a place of honoring Indigenous governance and right relationships with land.

2. What are reciprocal relational ethics for human-land relations?

The core principle of relational ethics is that ethical systems cannot be articulated or enacted in a vacuum. All 'ethics', defined as 'rules or principles governing desirable behavior', are operationalized through relationships. While a broad starting point, it presents a situated approach towards articulating moral conduct that examines the impact of one's actions on other beings (and oneself) through how those actions affect our current and ongoing relationships with those beings. This approach to ethics is intuitive, and familiar to many who have been taught the 'Golden Rule', – to treat others as you wish to be treated – which is complementary to the 'Platinum Rule' of treating others as they wish to be treated (Rönnedal 2015). Relational ethics lend themselves naturally to examining relations between species, and are not by default anthropocentric and transcend deep divides in Western moral philosophy (e.g. the debate on the possibility of non-anthropocentric value systems see Callicott 1984; Norton 1984). Among European scholars, Peter Kropotkin perhaps most famously articulated how relational ethics operate in nature in his 'Mutual Aid: A factor of Evolution' (Kropotkin 2021), when he observed that many interspecies relationships were based upon a principle of reciprocity that allowed for mutual flourishing.

As a branch of Western Moral philosophy, current definitions of relational ethics omit contributions from Indigenous ethical systems (e.g. Metz & Miller 2019). This is despite the rich scholarship around

ethics in land and interspecies relations – supported by many Traditional Ecological Knowledge systems – (Pierotti and Wildcat 2000), along with work from the global South articulating alternative Indigenous metaphysical frameworks shaping desirable human-environment relations and human ‘development’ trajectories more broadly (see Chidozie 2023; Gudynas 2014; Kawharu 2000 for several examples). Such approaches are similar to scholarship in contemporary behavioral ecology (e.g. Bekoff and Pierce 2009; Rowlands 2015; Rollin 2017), and new materialism and ecological agency (Alaimo 2016), which finds that not only are humans capable of forming mutually beneficial relationships with ecosystems and other species, but that a sense of fairness, reciprocity, and cooperation are just as hardwired into living beings as individualism, competition, and selfishness. The question of ethics then, is a concern shared by many species, and considers which relations are good and desirable, and which need to be individually and socially regulated to achieve the highest degree of individual and collective welfare.

2.1. Indigenous ethical frameworks

Given that Indigenous perspectives and scholarship are often omitted from western scholarship on environmental ethics informing conservation and land-based practices, we sought to better understand current Indigenous scholarship on relational ethics through a selective review of Indigenous relational ethical frameworks as applied to ecological restoration and land-based design practices.

Using Google Scholar, MIT Libraries, and JSTOR, we searched from the fall of 2023 to the spring of 2024 for English speaking articles authored at any time returned using the search terms ‘Indigenous ethics’, ‘Indigenous relational ethics’, ‘Indigenous frameworks’, ‘Indigenous ethical frameworks for ecological restoration’, and ‘Indigenous land ethics’ without the quotation marks. The inclusion criteria focused on works authored by Indigenous scholars which described a particular case of applying relational ethical principles in land and water based practices. Additionally, our (the authors) field experiences working with and listening to Indigenous communities on the ground were taken into consideration when analyzing the literature around Indigenous relational ethics. We drew upon literature documenting diverse geographies and contexts of Indigenous agro-ecological and biocultural practices to highlight both their specificity, as well as their use of shared underlying principles. Having a broad perspective on agro-ecological and bio-cultural Indigenous practices both from experience and from familiarity with the literature helped us balance the particularity of their contexts while at the same time finding some common themes. The reader will learn about these cases throughout the text as they connect at different moments with the arguments we present. Drawing upon this literature review, we identified common and contrasting elements within Indigenous ethical systems. Below, we share the main themes we identified when analyzing Indigenous ethical frameworks developed by Indigenous authors. We then elaborate on how to apply those concepts in our proposed framework.

2.1.1. Reciprocity and relational ethics

Restoring right and reciprocal relations between humans and their relatives is the principle goal and challenge of Indigenous ecological restoration (Deloria 1992). The relationship between humans and land is the one of a relative, the land is literally our ancestors and our future generations (Tassell et al. 2012). Therefore, for many Indigenous peoples, land is not a resource from which to extract from, land is sacred. When Indigenous peoples exist with the land, it involves reciprocal relationships – breeding, caretaking, listening, learning, teaching, and so on – and those relationships are rooted in spiritual worldviews (Tsosie 2012). Reciprocity is therefore a mutual breeding among different entities in the world and non-extractive by definition. Indigenous knowledge is nurtured through reciprocal dynamics maintained through deep relationships with land. Hence, Indigenous ways of knowing are inseparable from the ethical considerations of appropriate land-based practices (Tsosie 2012).

The right of practicing reciprocity as it relates to Indigenous spiritual practices and relationships with land and non-human entities has been formally inscribed in diverse policy instruments such as the Pachamama Alliance’s ‘Rights of Mother Earth’, the Ecuadorian Constitution, and in the United Nations Universal Declaration of Indigenous Rights (UNDRIP 2007) in Article 25:

> Indigenous peoples (IP) have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.

Enacting reciprocal relations with land, has also been the central tenet of global forms of Indigenous collective organization, including the World Council of Indigenous Peoples (WCIP), that argued for the recognition of Indigenous forms of governance and rights to self-determination and all subsequent rights enjoined in treaties as binding under international law.

The inseparability of the power to enact right relationships with land and the relational ethics of

reciprocity has been powerfully articulated by Glen Coulthard and Leanne Betasamosake Simpson in their 2016 publication 'Grounded Normativity/Place-Based Solidarity' which shared an ethical framework rooted in Indigenous place-based practices and relational ways of knowing and forms of knowledge.

> Grounded normativity houses and reproduces the practices and procedures, based on deep reciprocity, that are inherently informed by an intimate relationship to place. Grounded normativity teaches us how to live our lives in relation to other people and nonhuman life forms in a profoundly non authoritarian, non dominating, non exploitative manner … . Our relationship to the land itself generates the processes, practices, and knowledges that inform our political systems, and through which we practice solidarity. (Coulthard and Simpson 2016, p. 254)

Coulthard and Simpson offer this framework as a space to challenge capitalism, heteropatriarchy, and white supremacy with the aim that both in theory and practice comrades can unite in co-resistance to materialize their desires without replicating the oppressive methods and systems of settler colonial institutions that have historically led to the extraction of Indigenous lands and labor for their economic benefit.

2.1.2. Ethical coexistence and fundamental incompatibilities

At this present time, it seems that the ancestors' voices are particularly loud, given the rising popularity of Indigenous scholars and creators, such as the widespread success of Robin Wall-Kimmerer's (2015) work 'Braiding Sweetgrass' which offers the promise of reconciling Indigenous and Western ways of knowing. And yet, several observers have noted that without questioning the broader sets of power relations shaping access to land and defining acceptable resource use, then reconciliation of knowledge systems may perpetuate colonialism (Coulthard 2014; Gilio-Whitaker 2019). Similarly, attempting to address the harms of colonialism through the ethical paradigms and institutions of colonizing powers, simply reinforces the logics that have enabled dispossession and oppression in the first place (Winter and Schlosberg 2023).

Despite being rooted in diverse place-based relationships with the more than human world, we and other authors (introduced in the following lines) have found a broad degree of consensus among certain ethical principles. These ethics guide relationships between species as relatives, the land itself as living agentic entity as described by Aboriginal Australian articulations of Country (land and water e.g. Tynan 2021), and the Earth as an emergent supra-conscious entity (Winter and Schlosberg 2023). Despite their heterogeneous nature, Indigenous worldviews and ethics can be characterized at their root as based upon the understanding of the world through its interconnectedness, and the relationality of its parts – both inanimate and animate – (Boulton and Brannelly 2015). People, land, ancestors, water, and everything encompassing the more than human, are parts of an indivisible whole worthy of ethical consideration (Walker, 1987). These relational ethical paradigms have been utilized by Indigenous scholars to identify actionable ways to implement Indigenous relational concepts on the ground. For instance, Reid et al. (2021) argue for a framework called 'Two-Eyed Seeing' for ethical coexistence and complementarity of contrasting paradigms for fisheries research and management in three Canadian aquatic fisheries.

'Two-Eyed Seeing' is a stepwise framework for mutually recognizing knowledge in research in a long-term cyclical process, which include forming long-term relationships, mutual research interest, identification of required tools, co-developing research, co-evaluating results with communities, and sharing recognition and co-benefits. Another approach for such hybrid knowledge generation is Kelsey Leonard's (2021) climate and sea level rise adaptation framework for Tribal nations in the so-called northeastern and mid-Atlantic U.S. coast, 'WAMPUM'. The 'WAMPUM' framework proposes actions including 'Witnessing', warnings from human and non human relations; 'Acknowledging', traditional teachings and cultural stewardship processes; 'Mending', the shoreline and humans; 'Protecting' future generations; 'Uniting', with other communities; and 'Moving', to other places with cultural connections and rebuilding relations.

Both the 'Two-Eyed Seeing' and the 'WAMPUM' frameworks negotiate potential non-dominant relationships between western and Indigenous knowledge, one through research design and the other through climate adaptation. Similarly, other frameworks present ethical guidelines for researchers and scientists working in collaboration with Indigenous communities, including those focusing on Indigenous self-determination in research processes (Kelley et al. 2013; Hayward et al. 2021), and others identifying non-extractive modes of engagement (Naisilisili 2021, Porsanger 2004).

However, in the face of an increasing emphasis on equitable co-production of knowledge, some authors have identified fundamental incompatibilities between techno-managerial ecosystem services' paradigms and relational ways of engaging with land. For example, Lee et al. (2021) highlight the importance of the connection between bodies, lands and knowledges for Indigenous communities to thrive by explaining that Indigenous governance systems are connected to a deep history of interdependence between *'the people and the places they live, sustaining biological and*

cultural diversity over millennia' (Lee et al. 2021, p. 45). Lee et al. propose enacting this ethical framework based on 'Haida' values – of 'respect', 'responsibility', 'interconnectedness', 'balance', 'seeking wise counsel' and 'giving and receiving' – for ecological restoration and to re-assert First Nations governance authority over traditional territory.

Along the same lines, some authors speak about the ethical problems of conceptualizing nature as a resource. Kealiikanakaoleohaililani and Giardina (2016) argue that within the ecosystems services framework, sacredness has been relegated to a small role, as one cultural ecosystem service of many and warn about the limitations to achieve large-scale sustainability within a paradigm that seeks to minimize costs and maximize services and profits. In response they propose the concept of 'Embracing The Sacred' to connect place-based knowledge systems and culturally appropriate relationships through values of sacredness and abundance. With this, they challenge western commodity-based approaches for resource management and conservation, and invite western sustainability science into an Indigenous sustainability science and governance framework.

2.1.3. Refusal

Scholarly work on Indigenous relational ethics highlights a commonality of treating humans, ecological kin, and the Earth as one interrelated being. They also speak to shared challenges and benefits of enacting these principles in contexts where western knowledge is considered more accurate, substantial, and factual than Indigenous values (Tassell et al. 2012; Tsosie 2012; Boulton and Brannelly 2015; McAllister et al. 2023).

As a first step in challenging hegemonic, colonizing, and damaging systems, Indigenous scholars have articulated the need to engage in acts of generative refusal '*… to place limits on conquest and the colonization of knowledge by marking what is off-limits, what is not up for grabs or discussion, what is sacred, and what can't be known*' (Tuck and Yang 2014, p. 225). Refusal is generative, because by negating a certain action, ideas get redirected and questioned. By generating different worlds, one can center the material and spiritual needs of a community (Simpson 2017). Acts of refusal are fundamental for Indigenous self-determination, and are necessary to make space for the re-establishment of right relations, especially those required to heal people, ecosystems, and land (Deloria 1992; Coulthard 2010).

2.1.4. Healing

The centrality of healing, and insuring the continued health and wellbeing of people and ecosystems, is a central theme of scholarship on relational ethics, in that it is not possible to achieve human health without healthy relationships of people with themselves, their human communities, and their ecological kin (Kimmerer, 2015; Gilio-Whitaker 2019). In this sense, injuries to the land will always be felt in the health of the humans living on it – meaning 'environmental health' truly is human health – especially for communities continuously relying on landscapes for physical and spiritual nourishment and subsistence (Hoover 2017).

2.1.5. Right governance

Healing through re-establishing right relations is not possible without restoring Indigenous systems of governance (Coulthard 2014). Despite the effectiveness and growing emphasis on 'inclusion' of Indigenous knowledge for addressing biodiversity loss, climate mitigation, and adaptation, Indigenous peoples are inadequately included within global environmental governance forums – and are often denied adequate political representation within international bodies, never mind true government to government consultation with colonizing nations (Zurba and Papadopoulos 2023). Inclusion of knowledge without fundamental transformation of exploitative and colonial governance processes is extremely problematic (Cassin and Ochoa-Tocachi 2021; Cottrell 2022).

Enacting relational ethics in land-based practices must therefore address these inter-related dimensions of reciprocity and relational ethics, ethical coexistence and fundamental incompatibilities, refusal, healing, and right governance. We will elaborate on those concepts when describing our relational ethics framework. Before we turn to that work however, we first describe the core issues within dominant land-based design practices which necessitate the articulation of an alternative design paradigm.

3. Contrasting relational ethics with paradigms guiding current nature-based solutions, green infrastructure, and state led-large scale 'greening' initiatives

3.1. Problems with the paradigms and practices of dominant land-based design

Dominant land-based design practices, such as GI and NbS approaches, consider 'nature' is a series of connected mechanistic processes yielding various socially beneficial ecosystem services (e.g. see Grabowski et al. 2023 – for examples from city planning in the USA, and Lavorel et al. (2015) for a global perspective). In this paradigm, if society suffers from some loss of biophysical function from what a private property owner has argued is the

'highest and best use' (the utilitarian paradigm – Curtis 2004) of a piece of land, then it is entitled to process of mitigating that loss (the mitigation paradigm) and if loss cannot be mitigated then it is entitled to compensation (the compensatory paradigm -Race and Fonseca 1996). While seemingly rational under a regime of private property rights, in aggregate, these paradigms are the underlying philosophies that have enabled the current crisis in environmental degradation, biodiversity loss, and climate change (Hess and Holechek 1995; Burgin 2010; Latin 2012).

And yet, their utilitarian ethical logic continues to drive the development of local and global responses to these threats. In the United States, while GI can be defined in integrative ways to harmonize relationships between built and ecological systems for social benefit (Grabowski et al. 2022), it is more often applied as a piecemeal solution that does not challenge dominant decision making systems. In the United States for example, the most common form of implemented 'green infrastructure' is green stormwater infrastructure (GSI), a regulatory compliance strategy largely deployed to control urban or impervious cover runoff, which has an associated set of design standards (Grabowski et al. 2022), although in general it is applied to facilitate new development and redevelopment leading to significant equity concerns (Hoover et al. 2021). Although proving to be effective in the selective remediation and absorption of known toxic chemicals of concern (Taguchi et al. 2020), and if designed properly, deliver many quality of life benefits for urban residents, the ways in which GI planning are currently enacted largely reinforce 'business as usual' in other parts of the administrative state and larger set of complexes consuming land and resources (Grabowski et al. 2023).

Globally, NbS are rapidly gaining ground as a predominant climate adaptation strategy in both urban areas (Goodwin et al. 2023) and in the larger policy discourse around climate mitigation (Nesshöver et al. 2017). At their core, NbS are a policy framework created by the World Bank seeking to use natural systems to 'solve' climate change and biodiversity loss without addressing the political and economic causes and inequalities at their roots (Nesshöver et al. 2017). This in turn, requires local adoption of environmental governance regimes that, like global conservation initiatives that came before them, stand to reproduce the power dynamics whose symptoms they are attempting to address (Fairhead and Leach 1996; Tsing 2005). NbS are therefore rooted in a globalized techno-managerial environmentality (Agrawal 2020), defined as regimes of government that view land as an abstracted and fungible system of property, individual or collective, that must be 'managed' locally for a global collective benefit.

In the current political economy of NbS, their 'good' is seen as a calculus of who receives the 'benefits' of NbS projects, and if they outweigh or mitigate the harms experienced locally, even if their ultimate causes are produced elsewhere. As such, the dominant implementation of NbS, and its relatives of green infrastructure, and ecosystem-based adaptation (Wertz-Kanounnikoff et al. 2011), rely on a compensatory and utilitarian paradigm, whereby an 'improved' nature in one place can be used to mitigate harms produced by other social actors elsewhere. In practice, this means the majority of NbS are currently incentivized and funded by ecologically extractive economic activities, and similar to global conservation initiatives, often erode Indigenous rights to self-determination without slowing rates of resource extraction (Domínguez and Luoma 2020).

These logics are apparent in the most common form of NbS projects, carbon sequestration projects, whereby corporations and governments – usually in the global north – seek to achieve 'net-zero emissions' through land-based carbon capture, not by ceasing carbon emissions, but by claiming their emissions have been offset somewhere else, often in the forests of the global south (Goldberg et al. 2021). A review by Rights and Resources Initiative and McGill University (2021) found that most of the lands and territories selected for offsets *'overlap with areas customarily held by Indigenous Peoples, local communities, and Afro-descendant Peoples'*. This overlap is no coincidence, as these projects often explicitly seek to 'protect' biodiversity, and 80% of remaining biodiversity in the world is located in Indigenous territories still in Indigenous management or tenure (Parrotta & Trosper 2012; Toledo 2009; Loh and Harmon 2014). In the words of Fany Kurio Castro, one Indigenous leader witnessing large scale NbS projects proliferating across their territories in the Amazon:

> When I visit other territories, nearly all of them are in contact with a business related to carbon. Normally they arrive with a promise of big money if the community agrees to set up a project. Sometimes they don't let communities have access to their lands as part of the agreement but we live from hunting and fishing. For me, it's dangerous", she says. "The most cruel thing is they arrive in communities with long legal documents in English and don't explain what's in them. Many Indigenous communities don't read or have low literacy, so they don't understand what they're agreeing to. (Greenfield 2023)

Fany Kuiro Castro's statement exemplifies the struggle of Indigenous communities in the Amazon, suffering land dispossession from governments and private companies responsible for deforestation on the one hand and now new(er) forms of dispossession caused by carbon markets. This tension stems from clashes between utilitarian and relational ethical

systems intersecting with the political economies of land ownership and access.

By viewing the land primarily as a resource to be exploited for the ecological services it provides, while ignoring the various forms of human and built capital which produce those ecological services (Jones et al. 2016), NbS perpetuate a human-nature dichotomy and ignore the human-ecological relations required for their success. By doing so, they not only undermine their own effectiveness, they can also accelerate harm against ecosystems and Indigenous peoples. At their worst, NbS can enable continued global flows of resource extraction without addressing questions around justice and equity such as 'Who is benefiting from continued climate pollution?' (Rao et al. 2016). In the case of global carbon mitigation projects, NbS serve as sites for the absorption of chemical risks and hazards emitted in other locales, and as local mitigation for polluting industries and technologies. Moreover, many problematic projects have essentially been implemented as large scale tree plantation monocultures, in doing so they are damaging ecosystems, reducing biodiversity, and carrying through a long history of human rights abuses (FOEI 2021). In short, such projects enact negative, dispossessory, and violent land relations – or the opposite of relationality – contrary to the ongoing demands by many Indigenous peoples and organizations (Amorelli et al. 2021; Stabinsky 2021). Current NbS logics are also dangerous because they are based on scientific misconceptions. Fossil carbon and land-based carbon are part of different carbon cycles; carbon from fossil fuels take hundreds of millions of years to form and become stores underground, while carbon from land-use changes cycle much faster and NbS cannot absorb all of the carbon released by fossil fuel combustion (Carton et al. 2021).

NbS, rooted in techno-managerial environmentality (Agrawal 2020) defined as regimes of government that view land as an abstracted and fungible system of property, individual or collective, that must be 'managed', or quite literally put under the hand of regimes of property rights and state-centric policy formulation and enforcement. In these regimes, even ostensibly participatory forms of decision making continue to reinforce uneven power dynamics that limit their collective deliberative nature (Brisbois & de Loë 2016). Within this larger regime of environmentality, dominant conceptions of procedural justice, including how ecological beings are denied or granted 'standing' or 'agency' within human decision making processes, are often demarcated in ways that normalize and perpetuate injustices against Indigenous peoples (Celermajer et al. 2021). Advocates for NbS point at the need to get its messaging right (Seddon et al. 2021) and emphasize its transformative potential for repairing human-nature relations (Palomo et al. 2021; Welden et al. 2021), which we (the authors) argue requires going beyond its existing guiding logic and existing governance mechanisms that remain permissive of climate change, Indigenous dispossession, and pollution. Without deep consideration of the issues that relational ethics surface, many 'environmental' initiatives claiming to be 'sustainable', 'green', 'environmentally friendly' could be easily utilized as a vehicle to enact forms of 'green dispossession', which we provide a case study of below.

3.2. Green dispossession: the Bedouin Case

One telling example of dispossession of Indigenous pastoralists via state-led 'greening' initiatives can be found in the Negev desert on the Sinai Peninsula.

> … in South Sinai for many years (before the institutionalization of Egyptian State Control via St Katherine's Protected Area), the helf system, determined by the Bedu sheikhs, instituted a system of stiff penalties to ensure that accessible areas important for summer grazing were not grazed during winter, while if patchy rainfall left some tribal territories depleted, reciprocal grazing agreements permitted people to pasture their flocks outside their own lands. (Gray 2011)

For the Bedouin, humans have the right to enjoy the biodiversity and nurturance from Mother Earth which increases their livelihood and culture. In turn, Mother Earth itself has the right to enjoy the nurturance from humans – including seasonal resting periods for lands – so they can maintain their biodiversity and together they can make life sustainable (Naess 1989).

Nevertheless, the Negev Desert has historically been a contested territory where colonial narratives of productivity, afforestation, and urbanization have been used to dispossess the Bedouin people from their land (Abu-Saad 2008; Nasasra 2012; Yiftachel 2008; Meir 2018).

The aridity line is an arbitrary border defined by Zionists since 1931 to divide the 'mediterranean climate zone' and the 'aridity desert belt' through meteorological measurements thresholds. With that mechanism – the line – the Jewish National Fund (JNF) can argue for the non-productiveness of the desert – 'dead zones' (Nasasra 2012) – to claim for land dispossession through the 'greening' of the desert with the excuse of it transformation into 'fertile' ground. The land degradation caused by violent attacks in Palestine's lands has further worsened desertification (Abu-Saad 2008). The JNF used this situation to push the agenda of large-scale afforestation, and by *'restrictions on livestock grazing (pastoralism)'* directly affecting Bedouin livelihood (Weizman et al. 2015). This is highly problematic

because the Bedouin people have been developing methods to use a minimum amount of rainwater to cultivate their crops far beyond the aridity line and since time immemorial (Weizman et al. 2015). The dispossession of Bedouin's territories causes a violent interruption of relational and reciprocal dynamics with land and in turn the deterioration of their ecosystems.

JNF afforestation initiatives involve heavy machinery that disrupts the natural soil composition creating large and lengthy mounds of earth. These contaminate the area with herbicides used to eliminate local vegetation before planting young trees. Moreover, the earth mounds designed for tree irrigation on slopes prevent most rainwater from reaching the valleys below, leading to the drying of extensive areas downstream and the destruction of entire ecosystems. The restriction of grazing – which sustains Bedouin livelihoods – results in the proliferation of vegetation between trees, making forest fires more frequent and damaging.

The Bedouin example in particular illustrates how ethical frameworks prioritizing the 'productivity' and 'services' of land – to humans – can cause deep harm. Dispossession of the Bedouin via state-led efforts at 'green improvement' is also not limited to the Negev, and has been replicated in many regions around the world – e.g. the United States and Australia (Berry and Jackson 2018), across the African continent (Laltaika and Askew 2021), and China (Bellér-Hann and Hann 2020). It should be clear by now that if environmental initiatives do not purposefully center human-nature relations, then they have tremendous potential for harm.

3.3. *Transitioning to a framework for relational ethics: towards a framework for enacting relational ethics in Land-based design practices*

Dispossessing Indigenous peoples or enabling the continued creation of ecological and social sacrifice zones is certainly not the intention of many proponents of NbS, GI, or EbA. To serve their intention of restoring beneficial human relationships with nature, they must examine and replace their guiding ethical and governance systems to avoid the entrenchment of political, financial, and technological systems driving demand for global ecological services. To do so we (practitioners and scholars dealing with land-based design practices) must recognize how well-intentioned projects can perpetuate ecological and social harm. In taking seriously the need for local land-based practices to adapt to a changing climate, we need approaches for land-based design practice that can center right relations and healing. Such a framework must address the root causes of environmental degradation and Indigenous dispossession – namely political economies that prioritize extraction and domination rather than reciprocity and care – by resisting further harm and supporting Indigenous resurgence (Figueroa Helland et al. 2021). Indigenous communities have persisted and adapted to numerous attempts of colonization, imperialism, and erasure – and remain living proof that ultimately it is our (Indigenous peoples) relationship with nature that sustains us as a species and its principles must be embedded in our governance systems in order to restore harmonious and reciprocal relationships with the ecosystems that nurture us. In support of this larger goal, we (the authors) present below a conceptual framework to center relational ethics within land-based design practices.

4. Indigenous justice frameworks for relational ethics in Land-based design

4.1. *Introducing the framework*

We introduce 'Indigenous Justice Frameworks for Relational Ethics in Land-based Design' as an effort to guide the application of Indigenous ethics and values as they relate to reciprocal relationships with land and as an invitation to re-think the hegemonic paradigms currently leading Western ecological interventions on Indigenous lands. The framework takes the values explained under the concept of *grounded normativity* (see 1.1.1) and extends them to the realm of land-based design with a very important caveat: We (the authors) do not aim to inform current hegemonic land-based practices rooted in Western science values. We aim to dismantle the current paradigms that support extractive relationships with land and provide the context in which the visions of our ancestors and future generations can be materialized (Tuck and Yang 2014).

The 'Indigenous Justice Frameworks for Relational Ethics in Land-based Design' is not designed for a specific community or geographical area and we do not aim to generalize Indigenous governance systems, interventions, knowledges, or struggles. Neither do we claim expertise in Indigenous knowledges worldwide. We affirm that Indigenous knowledges are specific to their context and that in relationship with it, Indigenous peoples produce, create, contest, and collect wisdom. At the same time we recognize that there are similar understandings of relational thinking for decision making in Indigenous communities across the Earth. In doing so, we adopt the concept of 'definitional slippage' (Wildcat and Voth 2023) for the concept of relationality in the context of Indigenous research because it explains that relationality is not limited to specific or general definitions, rather an equilibrium of both. It would be a betrayal to the concept itself to define either in its specificities or in

its generalities. And it is within this space that the framework emerges. We identified mutual resonances from the multiple situated frameworks that we have presented earlier and we weaved those to draw lines of struggles and desires across Indigenous communities and lands because we believe that decolonization efforts should connect us in co-liberating actions.

The goal of this framework is to articulate alternatives for land-based design rooted in Indigenous worldviews and justice. This is a response to dominant policy and research discourses around land-based practices including NbS, GI, and ecosystem-based adaptation which are not effective 'solutions' to ongoing crises of climate change and biodiversity loss. We invite the reader to think broadly about the ramifications of a relational ethical approach that goes beyond the paradigms of improvement and anthropocentric utility.

4.2. Inseparability of bodies, lands and knowledges

The inseparability of bodies, lands, and knowledge forms the generative soil of this framework; every other section will have roots in the inseparability of bodies, lands, and knowledge.

Indigenous worldviews are represented by the coalescence of humans, non-humans, lands, and knowledge, understanding all as an indivisible multilayered whole. In short, where you are is the same as who you are (Tomateo 2021). As Mohawk scholar Audra Simpson explains, the connection of Indigenous bodies and lands generate *'knowledge, political systems, and ways of being'* that fundamentally challenge the dominance of settler governmentality. Harms against Indigenous lands are inseparable from harms to Indigenous bodies. Desirable relationships with land are grounded in ideas of reciprocity, solidarity, caretaking, and cyclicality. There are no hierarchies, positioning humans above non-humans. We (inhabitants of Earth) are all part of one related organism, and the health of our body relies on the health of our lands – all knowledge is evaluated based upon its ability to contribute to the well being of the land and all of its inhabitants (Cajete 2000).

Figure 1 shows a proposed schematic for the 'Indigenous Justice Frameworks for Relational Ethics in Land-based Design'. The framework is drawn as an infinite spiral anchored in the inseparability of Indigenous bodies, lands and knowledges, and represents a non-linear understanding of time and a structure that speaks to relational values across space (Tuck 2009). The spiral guides the reader through the elements of relational ethics and points of agency for designers to shape the past and future of a place. By doing so, the spiral highlights the impermanence of our bodies on the land which in turn provides the seeds for future events to materialize. The spiral is an invitation to go around in the loop while also gathering the knowledge and visions of the ancestors preceding our existence, more than human entities and each other to then guide our actions in solidarity with everyone that will come after our bodies go back to Mother Earth. It is a generous creative force, one that connects the desires of our ancestors to our actions – in the past, present, and future – as a continuum of offerings for the next generations.

4.3. Indigenous justice frameworks for land-based design practices

4.3.1. Generative refusal

We characterize generative refusal within the context of land-based design through four components in the spiral:

- Refusing colonization, assimilation, and usurpation of governance
- Refusing displacement
- Refusing ecological sacrifice zones
- Refusing harmful paradigms
- Rejecting toxic materials and practices

Generative refusal is not a reaction but an active contestation of settler colonization in all its violent dimensions. Through refusing both practitioners and scholars can potentially re-frame the conversation around land-based design. Instead of focusing on damage-centered stories (Tuck and Yang 2014) and the details of a specific situation, one can point out the structural oppression at the systems that support hegemonic practices leading to dispossession and violence of Indigenous land, bodies, and knowledges. Through refusal one can *'engage as related comrades joined in critical co-resistance against the convergence of forces that divide and conquer us and Earth on which we depend'* (Coulthard and Simpson 2016, p. 250).

As explained above the implementation of NbS through the carbon market leads to the dispossession of Indigenous lands, even in 'protected/reserved areas' (Amorelli et al. 2021). Therefore, it is reasonable to think that there is no true interest by settler colonial institutions to account for the demands of Indigenous bodies. The implementation of 'rights' to elaborate an illusion of inclusion (Corntassel 2012), only happens when there is an interest in extracting value from Indigenous lands.

The most common example of refusal for Indigenous peoples is not leaving their ancestral lands to resist industrial exploitation, and destruction. Sometimes this stops pipelines, oil extraction, logging, and other activities over their territories. More

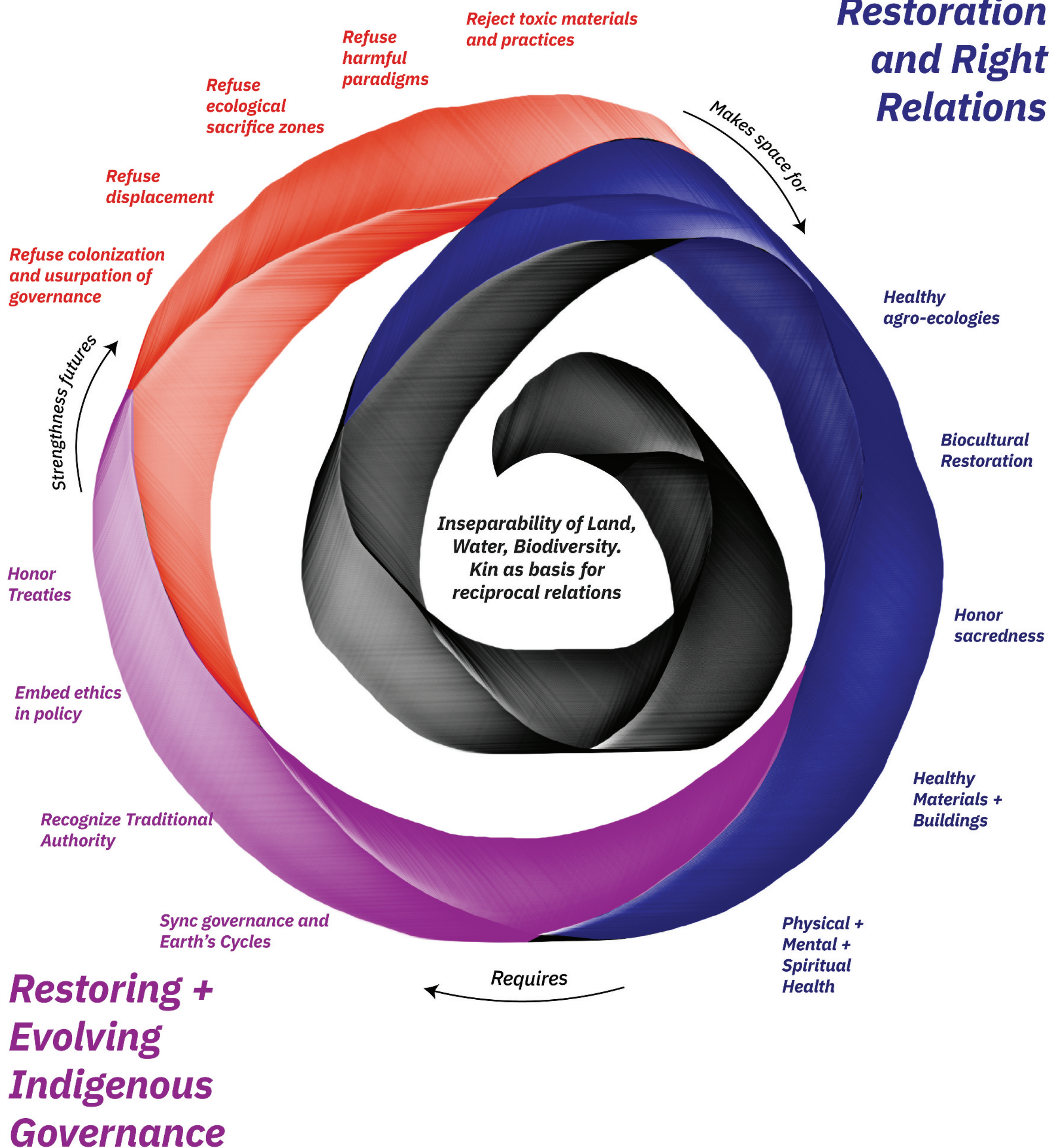

Figure 1. Framework structure. Tomateo, C & Grabowski, Z (2024). *Indigenous justice frameworks for relational ethics in Land-based Design.*

importantly it re-centers the discourse and puts in evidence the hegemonic/extraction tactics for 'development', the unsustainability of those projects, and the complicity of settler colonial states with extractive corporations. As we extensively explained in the previous sections, this leads to the elimination of Indigenous lands, bodies, and knowledges (Tuck and Yang 2012; Simpson 2014; Weizman et al. 2015; Blanco 2018).

For example, the case of the Sami community and the slogan 'ČSV' in so-called Northern Europe, emerged during the Sami revitalization movement in the early 1970s as a means of expressing Sami identity. The acronym 'ČSV' represented Čájet Sámi Vuoiŋŋa, meaning 'Show Sami Spirit', and it encouraged the incorporation of Sami clothing, joiking, art, and other Sami symbols into everyday life. This effort to make Sami culture more visible was a refusal to centuries of marginalization and minoritization in both legal frameworks and everyday experiences (refusing harmful paradigms, assimilation). 'ČSV' became a symbol for Sami people, and a tool to confront feelings of ethnic shame and inferiority (Dankertsen 2016). It gave rise to the 'ČSV' movement, which continues to significantly impact Sami life today, particularly within the Norwegian Sami Association

(NSR). More importantly, 'ČSV' continues to be a tool for the continuous construction of Sami identity and for the imagination of Indigenous futures for the Sami community (Dankertsen, 2016).

As semi-nomadic Pastoralists, Sami peoples' acts of creative refusal of sedentary policies indicate a recentering of their right to fluid relationships with land including the right of usage and passage (Kuhn 2020). The logic is simple, the dynamics of nomadic transhumant grazing systems include periods of time to allow the land to rest and regenerate. This means that the area of action is extensive, because letting the land rest is non-negotiable, otherwise they would be damaging the ecosystem and therefore themselves (refusing displacement and toxic practices such as not letting the land rest). These practices are common globally, and have supported the development of biodiverse Buffalo Commons ecosystems in the Great Plains of so called North America (LaDuke 1998), and in the pastoralist landscapes of central Europe (Feurdean et al. 2018).

Both, the cases of the Bedouin (explained above) and Sami's pastoralists, show that generative refusal is a cornerstone for confronting colonial concepts of land as a non-living entity whose primary value lies in its productivity and extractable resources (Weizman et al. 2015). We hope it serves as an example that not all green agendas are beneficial for all ecosystems (refusing ecological sacrifice zones), in fact they can dispossess Indigenous peoples from their lands (through landgrab), their bodies (through violence) and their knowledges (through the disconnection of bodies and land).

Numerous Indigenous organizations have been very outspoken about the threats of an extractivist agenda covered by promises of sustainability e.g. Biofuel Watch, Global Justice Ecology Project, Indigenous Environmental Network, La Via Campesina, Hoodwinked in the Hothouse, Indigenous Climate Action among others (Indigenous Climate Action 2020; Amorelli et al. 2021; Indigenous Environmental Network 2022). In November 2021, 257 organizations and 78 individuals from 61 countries signed the statement 'No Nature Based Dispossessions!' (2021) to warn about the harmful practices hidden within NbS' projects in the contexts of the UN Climate Conference (COP 26). Here we do not argue that all Indigenous peoples are against NbS, we argue that if we aim to achieve justice the deep criticism to NbS must be heard and some fundamental changes must be made. One necessary change being in the ethical paradigms we use for land-based design and executing refusal as a generative action to create better futures.

4.3.2. Centering healing, reparations and right relations

We characterize centering healing, reparations and right relations within the context of land-based design through five components in the spiral:

- Healthy agro-ecologies
- Biocultural restoration
- Honor sacredness
- Healthy materials and buildings
- Physical, mental, and spiritual health

When Spanish colonizers arrived to what today is called Peru in 1572, they put in place the *latifundio* system whereby the land could be owned by a person who does not work it (Blanco 2018). Through this mechanism, colonizers dispossessed Indigenous peoples of their land and forced Indigenous communities to work for them as servants. Several hundred years later, in the mid 1960s, a national movement including multiple strikes, protests, confrontations with the police overcame repression in the form of imprisonment of union leaders, torture, murder, and massacres, and on 24 June 1969 the Agrarian Reform Law was promulgated by Juan Velasco Alvarado. The agrarian reform returned 11 millions of hectares of land to their rightful owners, the Indigenous peasants of Peru, and is remembered by all Indigenous and non-Indigenous peoples that care about social justice as an example of people power managing to win against the oppressive system of the settler colonial state.

Even today, phrases from that time of struggle such as *'La Tierra Para El Que La Trabaja'* (The Land For Those Who Work It) can still be spotted in the recent national protests against the regime of Dina Boluarte, and signs with the face of Tupac Amaru – leader of the Andean rebellion against the Spanish in Peru – fill the streets around the government buildings. *'La Revolución y la Tierra'* (The Land and the Revolution), a documentary directed by Gonzalo Benavente telling the story of the Agrarian Reform from the perspective of the Indigenous peasant communities, was censored from national TV in the midst of the last presidential elections between Keiko Fujimori (daughter of the dictator Alberto Fujimori) and Pedro Castillo (Indigenous peasant and professor). The conservative sector was afraid it would influence the vote benefitting Castillo, and ultimately the documentary was banned. Despite all of the efforts to silence Indigenous stories of resistance, *'La Revolución y la Tierra'* was shared online through different platforms and is today the most watched documentary in the history of Peruvian cinema.

When watching *'La Revolución y La Tierra'* myself (Claudia), I felt deeply upset because I could see the stories of my grandparents in the eyes of the Indigenous peasants, but I also felt hope because it is a story that looks into the future. It is a story that looks at reparations in a radical way, and through *desire-centered narratives* (Tuck and Yang 2014), renews the visions of the people that came before us, and in doing so it heals (physical, mental and

spiritual health). This story highlights the fundamental need to repair our connections with our lands as a way to heal and to imagine Indigenous futures. Indigenous peoples exist in relationality, and without land relationships with the earth die.

The history of the Peruvian Agrarian reform is not one of peace, there are plenty of debates surrounding it. But what is a fact, is that a big area of land grabbed through colonization processes was returned to the Indigenous peoples, thousands of families returned to their lands, communities were reunited and processes of communal healing through relationality processes began and continue to happen.

As explained through the Peruvian agrarian reform example, to facilitate healing following Indigenous ethics, one must understand that healing is not about forgiving one another, but committing to ongoing reparations as a process. Here, we (the authors) do not mean that someone needs to offer reparations, nor that Indigenous peoples should expect reparations from settler colonial states, but that we all can engage ourselves in a process of collectively repairing our own narratives and relationships – often facilitated by the agency of land (biocultural restoration). Healing then, is inevitably tied to relationality with land. Page and Woodland in their book ‘Healing Justice Lineages’ (2023), elaborate on the connection between healing processes and the sacredness of land:

> Healing justice is rooted in place and ancestral technologies … . Without roots we wither. Without interdependence we sicken and die. Without access to what the soil remembers, what our ancestors carried through all that happened to them, we become adrift, vulnerable to isolation, illusion and despair. (Page and Woodland 2023, p.9)

When thinking about land-based design interventions practitioners and scholars must understand the land has history (honor sacredness), and that it has probably suffered harm from settler colonial states, carbon markets, extractivism, and so on. Fundamental to this framework is articulating ways of healing and repair. This can take many forms, from storytelling and fire ceremonies, recovering ancestral seeds and the rotation of crops, to removing and metabolizing toxic chemicals and narratives.

Land-based design practices include the creation of buildings as well as the use of agro-ecological systems to produce materials that can be used in a multitude of ways. Given that due to toxic building materials, indoor air quality is often worse than outdoor air quality even in heavily polluted cities, a key health intervention of design practice includes examining the broader systemic sets of relationships that make the built environment and manufactured goods possible. Embedding relational ethics within material systems is an important element of our framework, and aligns with emergent concepts of the circular bioeconomy, if enacted through a relational ethical lens. In this sense, a relational ethical framework calls for caring for ourselves and our world through our built and manufactured systems, as they are always in relation to one another.

Examples of this philosophy in action include the merger of high technology of precision, custom, and on demand manufacturing technologies like 3d printing using bio-based materials that replace toxic materials with ones that support human and ecosystem health (Bhatia and Ramadurai 2017). Despite long term issues with market penetration, non toxic construction techniques, interdependent with regenerative agro-ecological systems, are quickly gaining ground (Koster and Schrotenboer 2022). It is increasingly recognized that almost 40% of global greenhouse gas emissions associated with the construction and operation of the (non-transportation) built environment must be addressed through carbon drawdown building technologies (Konan 2023). Indigenous communities worldwide have been at the forefront of these initiatives, especially the ones related with traditional architecture as Indigenous technologies (O’Rourke 2020). Combining regenerative land care practices with evolved natural building technologies can substantially reduce global greenhouse gas emissions while eliminating many other forms of harm and enabling healing in multiple domains.

4.3.3. Restoring and evolving indigenous governance

True healing across the five domains identified above is not possible without restoring governance systems and biocultural activities on the land. It is not only about having access to the land, but most importantly being able to engage in acts of reciprocity and co-nurturance in relationality with Mother Earth. We invite the reader to think about the ways in which they can facilitate the relationships that cultivate decolonized worldviews of respect, reciprocity, mutuality, and solidarity across communities with the rest of the living world and Mother Earth (Amorelli et al. 2021).

We characterize restoring and evolving Indigenous governance within the context of land-based design through four components in the spiral:

- Honoring treaties
- Embedding ethics in policy
- Recognizing traditional authority
- Syncing governance and earth’s cycles

4.3.3.1. Pacha, chakra, ayni, and aynoq’a. To understand how Indigenous systems of governance, and specifically traditional systems of governance, relate

with biocultural activities in everyday life, we will share an example that speaks to the Andean concepts of *pacha*, *chakra*, *ayni*, and *aynoq'a*. With this, we aim to show how a reciprocal relationship with land is interdependent with particular governance systems and forms of land relations. The Andean term *pacha* refers to the tension between forces, from which results energy and cosmos movements, meaning, life. In many places in Abya-Yala Indigenous communities use the term *Pachamama* (Mother Earth) to refer to the wise organism that provides and takes care of ourselves, and that in turn it also needs to be taken care of (Figueroa-Helland 2012; Mamani 2010) the *Pachamama* usually takes the shape of soil. The idea of *pacha* sets the basis of Andean ethical engagements, guiding relationships (human, and non-human) between forces, energy, and movements.

One of the purest manifestations of *pacha* is agriculture, as it is a direct connection between human, water, sky, and ancestors' energy with land. Humans, because we get nurtured from and nurture the land, water because it fertilizes the land, sky because its orientation relative to land dictates the solar radiation, and ancestors because when life ends, it goes back to land, literally (Figueroa-Helland 2012).

Indigenous relationships with land come along with specific governance systems, calendars, and rituals. Andean communities structure their organization within a 'system of burdens' or *ayni* (embedding ethics in policy), meaning there is an intrinsic sense of reciprocity between families as they take turns to work on construction, planting seeds, harvesting, and drying produce.

Figure 2 illustrates the system of Aynoq'a, an example of living in *ayni*. The Pomani community (located in what is now Bolivia) grows a variety of tubers following a thirteen-year cycle (Grillo et al. 1990). At the top of the figure there is a circular calendar divided in five sections, four of them represent a year of 'production' and the fifth section represent 7–11 years of rest. The bars that offset from the outer circle mark the different activities that are performed corresponding to the months of the year (plowing, planting, harvest, rest). At the bottom of the figure there is a map of the subdivision of land, in this case there are 13 *aynoq'a* listed at the bottom-right of the figure. Each aynoq'a is a subdivision of land managed by the *ayllu*, a land-responsible social unit composed of several households. The four *sayañas* listed in the figure, are communal lands managed by several *ayllus* or families (syncing governance and earth cycles).

Each Aynoq'a holds specific microclimates, these are well suited for specific types of crops, the community plan the rotation accordingly so they can have diversity of produce. The case of the Aynoq'a system makes clear there is deep relationality between spatial configurations, biocultural activities, governance systems, and everyday life. Thus, it is not just about the restitution of land back to the Indigenous communities, but also about supporting the restitution of the biocultural activities that support life on that land and the governance systems that organize the communities around the land (recognizing traditional authority).

The governance systems in Indigenous communities correspond to the way they relate with land physically and spiritually. Sometimes this is recognized somewhat by settler colonial states such as in the case of the Sami people (honoring treaties) who have a parliament in Norway, Sweden and Finland and who through the Finnmark Act (FINNMARKSLOVEN 2005) register their lands to the Finnmark State (a legal body that represents Sami people). Other times, governance systems are embedded in the relationship with the land such as in the case of the Pomani community.

5. In closing: relational design thinking and just relational practices

During the course of writing this article, I (Claudia) was able to enact elements of this framework while conducting fieldwork related to my doctoral studies in the San Martin region of what is now called Peru. I have been conducting interviews since January 2024 to study Indigenous calendars facilitated by *Waman Wasi* and *PRATEC*, two local NGOs. These are used as tools for the regeneration and transmission of Indigenous knowledges. To draw those calendars the young people in the community interview their elders, then the grandfathers and grandmothers share through oral histories the ancestral knowledge to the new generations. Oftentimes, the elders would say that the young people would not go to work in the *chakra* anymore . . . perhaps because *'they are more distracted with technology now'*. However, after having conversations with the community elders on topics such as how to collect seeds, the secrets to harvest good corn, and hints from the environment that say it's time for planting, the youth would place higher value on their relationships within their own family and community, and they would go to the *chakra* to practice everything they learned. They would do it with love. Love and care are at the core of Indigenous governance systems *'we delegate responsibilities because we care'* said one of the young leaders from the Simbakiwi Yaku community.

This example shows that it is not only about Indigenous peoples access and agency to their rightful lands, but also resisting the forces that negatively affect relational ethics and connections between peoples and land. Through those same connections, they teach and learn to and from one another.

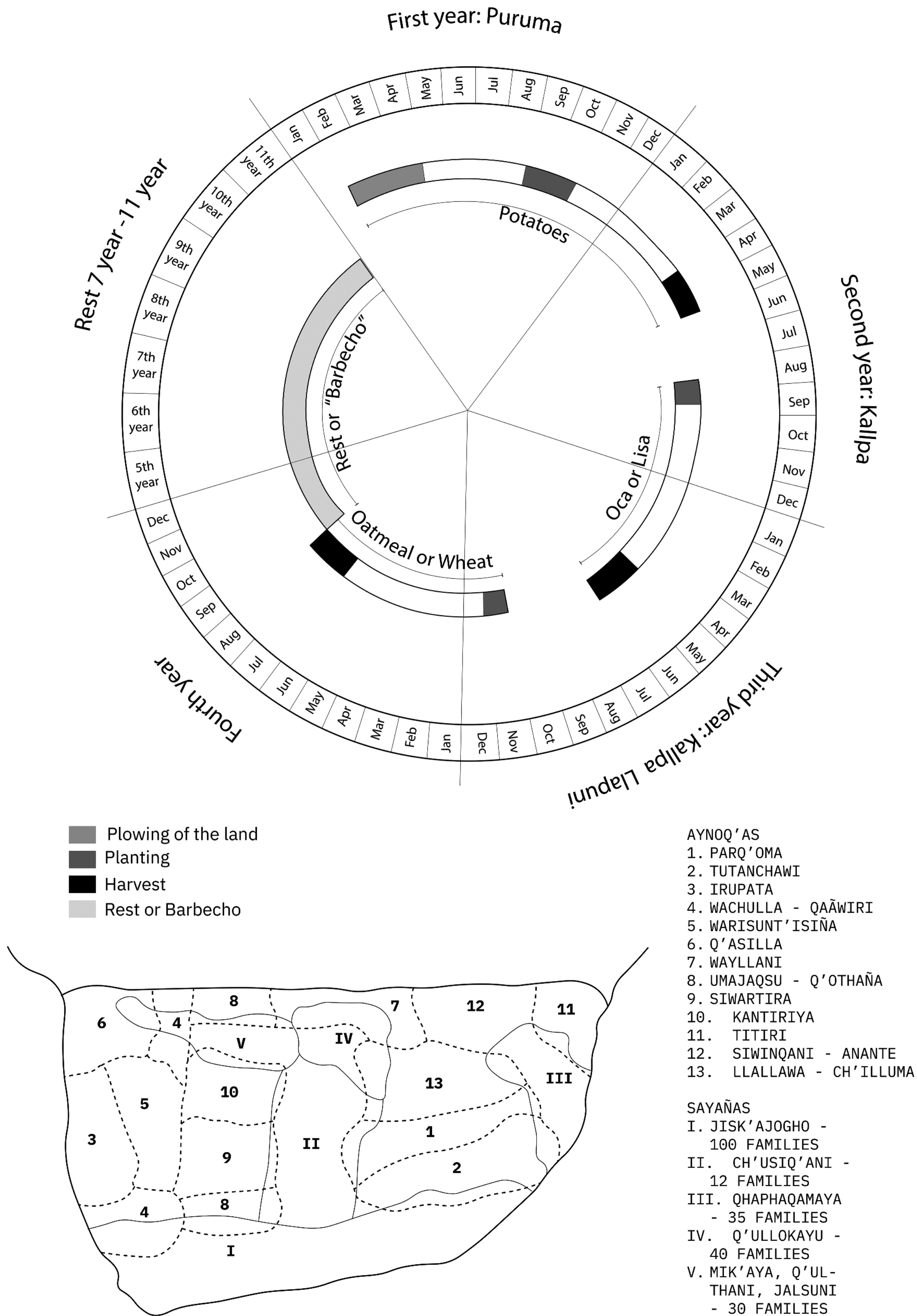

Figure 2. Adapted from 'calendario agrícola en la comunidad de chorojo, Departamento de Cochabamba' and 'Aynoq'as' from Grillo et al., 1990, p 53.

As I (Zbigniew) wrote this article, I drew upon my experience interacting and working with Indigenous communities in the Comarca Ngobe-Bugle and within the Nch'i'wana/Columbia River basin, in their efforts of self-determination in the face of shared challenges of attempted and forced dispossession, environmental degradation, and uneven development with irrepressible vitality, humor, and creativity and resurgent forms of governance and cultural practice. This work continues into the present through engagements with the Native Alliance of Saukiog/Hartford CT, and attempts to restore the land and waters of the Eastern Pequot and Mashantucket-Pequot Tribal Nations through the Alliance for the Mystic River Watershed.

As we've written this article, we (the authors) hope to highlight the difficulties and opportunities to engage relational ethical approaches in colonized and infrastructure saturated landscapes that nevertheless refuse to be silent and to flourish as best they can – the land is still speaking, and the land is still listening and observing.

We offer this framework in the spirit of holding space for community building, interspecies engagements, and intergenerational conversations at the center of restored spiritual frameworks and governance as part of the broader push to restore Indigenous governance systems and biocultural practices – and to facilitate a paradigmatic shift to understanding humans as part of the natural world. There are several Indigenous frameworks informing the creation of the 'Indigenous Justice Frameworks for Relational Ethics in Land-based Design'. While some focus on the ethical coexistence of different paradigms ('Two-Eyed Seeing') and climate sea level rise adaptation ('WAMPUM'), the framework proposed here focuses first on affirming Indigenous relational ethics and values, and then finding ways to enact them in concert with the Earth. This is not a framework to negotiate Western vs Indigenous worldviews, this framework centers Indigenous relational ethical approaches as a starting point to inform our own land relations. In this way, it is close to Lee et al. (2021) approach, in that they too first declare the incompatibility between techno-managerial ecosystem services and 'Haida' values, and seek to center Indigenous holistic philosophies for ecological restoration. Finally, the components of the proposed framework – the elements of the spiral – exist within the definition of 'grounded normativity' (Coulthard and Simpson 2016), meaning that the core of the spiral is defined by deep relationality and reciprocity first, and it is from that core that everything else unfolds. The framework proposed here advances the discourse by providing examples and further guidelines to explain how relationality can be actionable. Through charting a path for changed practices, we hope to build greater momentum for healing and restoring biocultural relations and social and political power, a virtuous cycle enabling Indigenous justice.

We also hope we have made clear that despite their stated intention to improve climate resilience and repair ecosystems, dominant NbS approaches will likely continue to perpetuate harm and prove ineffective. In response, people planning, designing, and thinking land-based design must dismantle their flawed logics and hidden ethical systems and replace them with practices of land care that center the refusal of harm, the healing of humans and ecosystems, and the creation of good governance systems. While the design of land-based practices cannot achieve these ends on its own, by embedding relational ethics within design thinking, we can identify synergies between agro-ecological restoration projects and the broader social, ecological, and technological transformations contributing to the achievement of justice and human's relational dynamics with Earth/*Pachamama*.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

Author's contributions

Claudia Tomateo is a detribalized Indigenous woman descendant of the Quechua Chanka people in so-called Peru. The author acknowledges the bodies and unceded lands of the Chanka ancestors whose desires and visions inspire her work. Claudia resides in the unceded territories of theWampanoag Nation and the Massachusetts people where she is a doctoral student at Massachusetts Institute of Technology (MIT). She acknowledges the histories of dispossession and genocide in these lands and the ongoing processes of colonialism and dispossession in which MIT is implicated. MIT has long profited from the sale of the unceded territories of 82 tribes granted by the MorrillAct. Tomateo's research focuses on the restitution of Indigenous worlds through spatio-temporal visualizations grounded in ideas of reciprocity, solidarity, caretaking, and cyclicality. Most recently, Tomateo has collaborated with theQuechua and Awajún communities in the region of San Martin in what is now the settler colonial state of Peru.

Zbigniew Jakub Grabowski is a Polish arrivant residing and working on lands of overlapping Indigenous relations and Nation since time immemorial including unceded Tunxis, Massacoe, Wappinger, Mashantucket-Pequot, Massacoe, Mohican, Paugusset, Wangunk, Saukiog, Mohegan, Eastern Pequot, Nipmuc, and Schaghticoke Peoples in the so called State ofConnecticut, CT, USA. His sense of responsibility to address social and ecological justice comes from his experience as a Polish person and intergenerational survivor of the Holocaust and purposeful near total destruction of his home city of Warsaw, Poland. He also remains connected to his Indigenous Slavic heritage via an acknowledgement of the agency of the natural world, and explicitly seeks to build solidarity with all Peoples, human and otherwise, experiencing intersections of material and narrative erasure and genocide. By addressing questions of proper social, ecological, and technological relationships through an explicitly ethical lens, he seeks to restore right relations through building collaborative and resurgent governance systems and develop transdisciplinary forms of creative inquiry and expression manifesting in practical interventions in the realms of agro-ecological restoration, manufacturing, and the built environment. He currently works as an Associate Extension Educator in Water Quality for the University of Connecticut's Center for Land Use Education and Research and is a Research Fellow at the Urban Systems Lab at the New School, NYC, USA.

Ethical statement

The authors invite the reader to this space designed to center Indigenous ethics, and to trust the land as a wise teacher guiding us through ways of knowing, and ways of living in relationality.

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