

'Energy Justice'? Pastoralism, political ecology and lower-carbon energy transitions

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ARTICLE INFO

Keywords:

Lower-carbon energy
Renewables
Energy justice
Pastoralism
Political ecology
Consent
Kenya
Mongolia

ABSTRACT

As global renewable energy (RE) capacity continues its unprecedented expansion, green extractivism and energy justice (EJ) have become increasingly pressing concerns, both in critical political ecology-inspired studies and where lower-carbon energy (LCE) infrastructures touch down in particular places and everyday lives. Here we focus on the justice implications of LCE transitions and the processes by which they are produced specifically in pastoralists' lands and communities. We argue that these remain relatively marginalised in current scholarship, despite pastoral drylands globally becoming targets for roll-out of large-scale LCE, facilitated by intersection of their environmental characteristics and the livelihood strategies, land rights and relations of their occupants, and underpinned by re-emergent discourses of empty, degraded wastelands. The aim of this paper is to enhance critical understanding of EJ in pastoralist communities and through this to advance current debates on EJ principles and meanings and the role of non-Western norms, place and land relations therein. Our two-stage study draws on systematic desk-based analysis of pastoralist case studies globally and on secondary and empirical material from Kenyan and Mongolian case studies. It utilises Sovacool's (2021) '4Es' framework to examine the subtleties of how enclosure, exclusion, encroachment and entrenchment operate in these contexts, and links these to the production of particular energy-related injustices. We highlight the importance of non-Western, place-based meanings of EJ, grounded in local land relations and of contested concepts of consent, including Free, Prior and Informed Consent (FPIC) as critical in refining EJ principles and in shaping prospects for locally owned, just energy transitions.

1. Introduction

As global renewable energy (RE) capacity continues to expand at an unprecedented rate (IEA, 2024), issues of energy justice have become increasingly pressing concerns, both in sites of mineral extraction and where lower-carbon energy (LCE)¹ infrastructures touch down in everyday lives (Dunlap et al., 2024a; Stock and Sovacool, 2024). What Shokrgozar et al. (2024:1) term the "utopian discourses of energy transitions", whereby socioecological justice implications are rendered

illegible in dominant technocratic framings, are confronted in a growing body of scholarship on political ecologies (PE) of energy and green extractivism (Knuth et al., 2022; Shokrgozar et al., 2024; Stock and Sovacool, 2024; Tornel, 2023b). Green extractivism, or "forms of resource extraction linked to or justified by the "green" economy"... including energetic extraction from renewable resources ... and all the extractive operations...needed to produce renewable energy..." (Bruna, 2022: 846), is implicated in commodification of nature, and creation of new and intensification of pre-existing forms of injustice, widely

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¹ Except for initial reference to 'renewable energy' to reflect IEA's 2024 report, we use the term 'lower-carbon energy' (LCE) to refer collectively to wind, solar, hydropower, geothermal energy (after Karam and Shokrgozar, 2023).

<https://doi.org/10.1016/j.geoforum.2026.104767>

Received 19 September 2025; Received in revised form 4 July 2026; Accepted 12 July 2026

Available online 20 July 2026

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facilitated by ‘green grabbing’ of local resources (Dunlap et al., 2024b). Energy justice (EJ)² frameworks are increasingly deployed by PE scholars in analysis of these impacts (Bontempi et al., 2025). EJ analyses variously draw on ‘classic’ tripartite justice concerns of distribution, participation and recognition, in some cases extending to cosmopolitan and restorative justice. Others argue for decolonising EJ through delinking from universalised, Western norms; through place-based, situated reformulations – or even wholesale rejection – of EJ as a concept (Dunlap and Tornel, 2023; Tornel, 2023a,b).

Here, we focus on LCE transitions³ and their justice effects in pastoralists’ lands and communities. These are increasingly becoming targets for large-scale LCE, facilitated by intersection of their environmental and climatic characteristics, (Dunlap et al., 2024a,b), and pastoralists’ land-use and livelihood strategies, typically characterised by flexibility and varying degrees of mobility in the exploitation of extensive rangelands. As argued by Tornel (2023a:55), low-carbon transitions entail “a worldwide reconfiguration of land. Spaces appear empty, ready for the taking...”. We argue that these processes are particularly acute in pastoral lands, wherein the prevalence of informal/customary tenure and seasonal mobilities render pastoralists particularly vulnerable to energy-related extractivisms and exclusions. As Dunlap and Marin (2022:7) remind us, transitions to LCE “are [typically] associated with enclosing land, privatizing common resources...”, the very resources on which pastoralists rely. It is also notable that LCE investors in pastoral landscapes are strategically cultivating discourses of ‘empty’, wastelands, or ‘terra nullius’ – discourses that have historically underpinned conservation, development-related and colonial-era injustices (Lind et al., 2020; Stock and Birkenholtz, 2021). We draw on a PE framing to develop insights into the production, nature and experiences of energy (in)justices, focusing on pastoralist communities, who have rarely formed the explicit focus of contemporary work on EJ.

Knuth et al. (2022) argue that PE is well-positioned to lead scholarship in this area, through exposing the ‘rendering technical’ of energy transitions, their unfolding and justice effects on the ground. Drawing on contemporary work on the PE of low-carbon transitions (e.g. Boateng et al., 2023; Mulvaney, 2024) and on EJ and dispossessions (Dunlap et al., 2025; Stock and Birkenholtz, 2024; Tornel, 2023b; Van Uffelen et al., 2024), we utilise Sovacool’s ‘4Es’ framework (Dunlap et al., 2025; Sovacool, 2021) to analyse how enclosure, exclusion, encroachment and entrenchment are produced through LCE interventions and in turn produce particular injustices among pastoralists. Following LaTosky (2021) and Tornel (2023a,b) we further highlight the role of contested concepts of consent and justice. Our study draws on desk-based analyses of pastoralists’ experience globally, and on empirical analyses of the situation in Kenya and Mongolia, where mobile pastoralism constitutes a key livelihood strategy. Mongolia also has a leadership role in the 2026 UN International Year of Rangelands and Pastoralists (IYRP), wherein pastoralist groups from across the world are finding common ground in contesting diverse, including energy-related, injustices.

We begin by situating our analysis in relation to contemporary debates on the PE of EJ. Following a brief methodology section, we develop our analysis of PE of LCE in pastoral societies, drawing primarily on published sources. Following Scoones (2021:2) whilst fully cognisant of cultural and geographical diversity, we argue that common features of “exploitation of variability, particularly of natural environments, and the importance of flexible forms of mobility in the face of diverse uncertainties” shape pastoralists’ EJ experiences across various geographies. We then provide more in-depth analysis of our two case study

countries. Our conclusions and contributions are summarised in the final sections.

2. Political ecologies of energy (in)justice

Central to much PE-informed EJ scholarship are the impacts of LCE investments and infrastructures where they ‘touch down’ on the ground, through land transformations and ‘green grabbing’, critical to green accumulation and extractivism, and with due attention to rural politics and inequalities (Dunlap et al., 2025; Stock, 2022; Stock and Birkenholtz, 2024). PE highlights underpinning uneven power relations and remains characterised by its “dual mandate [not only] of ‘critique... [but also] ...reimagination”, in relation to energy injustice (Knuth et al., 2022:999). Exacerbation of existing and creation of new injustices has been well documented (Garcia et al., 2024; Ramirez and Bohm, 2021; Sovacool, 2021), with recent work highlighting justice issues at multiple scales and sites along LCE production and value chains (Stock and Sovacool, 2024). Direct LCE-related green extractivism typically takes physical forms for example: “enclosing land and privatizing common resources; ... clearing of trees and habitats; the draining of water tables for concrete foundations...” (Dunlap et al., 2024b: 450), whilst indirect forms entail wider supply chains and operations. Both have EJ implications, particularly in relation to land alienation and access and thus reflect classic distributive justice concerns.

In considering EJ in more detail, Van Uffelen et al. (2024:3) critique the continuing prominence of a ‘three tenet approach’, focusing on distributional, procedural and justice as recognition. This is also central to much ‘mainstream’ environmental justice scholarship, on which EJ draws through extending justice concerns to energy poverty, production, distribution and access (Jenkins et al., 2016; Menton et al., 2020). Others propose a five-dimensional EJ, through addition of restorative and cosmopolitan justice (Heffron and Sokolowski, 2024), but with the point remaining that these formulations do not decentre EJ from its conceptual roots in largely Western-derived environmental justice traditions. More radical critiques argue for reformulation of EJ theory through concepts of non-Western theorists and cultures, and by considering the rights and agency not only of people but also of non-human nature (Lang et al., 2024; McCauley et al. 2019; Sovacool et al. 2017; 2023; Tornel, 2023a). Such approaches, in Tornel’s (2023b: 1) words, constitute a “move away from a universal definition of EJ” and may serve to counter the “coloniality of justice” (Alvares and Coolsaet, 2018), by which non-Western, indigenous norms may be silenced (Dunlap et al., 2025; Sovacool et al., 2025). In environmental justice scholarship, Menton et al., (2020) similarly highlight increasing prominence of interconnected ‘critical’, ‘ecological’ and ‘decolonial’ frameworks as responses to the limitations of ‘mainstream’ environmental justice, and which variously stress intersectionality, embeddedness and reform of existing power structures (after Pellow, 2018); justice for non-humans; and redress of the ‘epistemic violence’ occasioned by Western-derived justice norms and frameworks (after Alvarez and Coolsaet, 2018). They argue for an intersectional, decolonial framing of environmental justice (IDEJ), which combines some of the key concerns of critical and decolonial traditions, and for its pertinence to energy regimes (ibid). Sovacool et al (2025) argue that their recently developed ‘complex EJ framework’ serves to strengthen links between EJ and such environmental justice framings, through its emphasis on interconnected racial, spatial, interspecies, recognitional, procedural and colonial energy-related injustices and the importance of indigenous self-determination. Tornel (2023a) further contributes to development of decolonial EJ thinking through emphasising the critical importance of grounding EJ in sense of place and the mutually constitutive relationships of diverse (e.g. indigenous) communities with their land. Here we respond by analysing local place-based conceptualisations of what produces and constitutes energy injustices amongst pastoralist communities, and the contested role of Free, Prior and Informed Consent (FPIC) therein, FPIC being variously conceptualised as ‘a foundational

² The abbreviation EJ here refers *only* to energy justice.

³ We use the term ‘transition’ as widely deployed in literature on EJ and LCE. We do so with due cognisance of Fressoz’s (2017) argument that energy systems are rarely substitutive, with one completely replacing another, but rather have historically been additive and interdependent.

principle of Indigenous energy justice' (Sovacool et al., 2023), a 'bureaucratic trap' (Dunlap, 2018) or tokenistic, divisive 'façade of dialogue', facilitating green extractivism (Tornel, 2023b).⁴

Overall, our analysis utilises Sovacool's (2021) PE and EJ-inspired '4Es framework'. This posits four key, interlinked processes as integral to many lived experiences of low-carbon transitions. 'Enclosure' denotes capture of publicly held resources, typically but not exclusively land, by private interests, often constituting a form of 'green grabbing'. The associated process of 'exclusion' highlights policymaking and planning processes that eschew recognition or genuine participation of local communities, and thus facilitate resource appropriation, including through marginalisation of non-dominant values and knowledges. 'Encroachment' highlights ways in which LCE interventions may have pernicious effects on local environments. 'Entrenchment' denotes the ways in which interventions may lead to or exacerbate existing vulnerabilities and inequalities, for example, through further marginalisation of women or indigenous groups (Lind et al., 2020). Consistent with the critiques noted above, we treat the framework as analytically useful but seek to bring it into dialogue with critical and decolonial EJ perspectives. Our study also responds to Sovacool et al.'s (2021) call for more comparative studies and for inclusion of more non-western cases. The 4Es are further brought into tension here with ten suggested EJ principles (after Sovacool et al., 2017). These are arguably grounded primarily in Western-inspired EJ norms, but are further developed to better reflect non-Western, place-based meanings (see Table 1, Section 5.2). In adopting this framing, we follow Dunlap et al. (2024a) in that our analysis of EJ reflects issues of primary importance to our respondents, including where these map onto tripartite 'mainstream' EJ norms, whilst in no way detracting from recognition of the need for decolonial approaches. Where place-based norms and specificities that contest these framings emerged through our analysis, these are highlighted accordingly. Overall, we contribute to ongoing, critical debates on large-scale LCE and EJ through a) our focus on pastoralist communities and landscapes; b) analysis of how injustices are produced through the 4Es therein; and c) analysis of place-based meanings and lived experiences of EJ; linked to expansion of EJ conceptual frameworks.

3. Methods and sites

Initially, we undertook a desk-based analysis, informed by the principles of PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), designed to enhance transparency in systematic reviews and increasingly employed in socio-environmental studies (de Lemos et al., 2024; Page et al., 2021). Figs. 1 and 2 document search terms and flow of the process. Our objective was to explore the impacts of large-scale LCE developments on pastoralist communities worldwide, through a lens of EJ. Searches of the ISI SCOPUS database, widely used for its comprehensive coverage of scientific, peer-reviewed literature (Zurba et al., 2026), were conducted for articles published between 2000, when large-scale LCE expansion in pasturelands started to become evident, and 2023 (Waters-Bayer and Wario 2022). These focused on article topic, title, abstract and keywords and used combinations of search terms (Fig. 1). Articles were excluded from the original $n = 312$ (Fig. 2), according to stated criteria, with supplementary searches focusing on strings 1–2 only to ensure inclusion of pertinent sources.

The resultant 23 sources, which included cases in Norway, Sweden, Finland, India and Kenya, were analysed in relation to the 4Es framework and the specificities of pastoralist lands and livelihoods (Section 4). These ISI sources were complemented by grey literature (e.g. Waters-Bayer and Wario, 2022; Wario, 2022) and, for more in-depth case

Table 1

Energy justice principles and energy (in)justice in Kenya drylands.

#	Energy-justice principles (after Sovacool et al., 2017: 687; additions in bold)	Energy (in)justice in Kenya's drylands (authors)
1	Availability (e.g. of sufficient, quality energy to meet needs)	Inhabitants of areas where mass production of LCE are undertaken lack access to even basic energy sources.
2	Affordability (cost of energy should not exceed 10% of income, including for poor)	Energy sources not affordable to the already marginalised poor households at locations of LCE production.
3	Due process (respect for due process & human rights in countries' energy prod. & use)	Development of energy projects may be undertaken without due regard for legal process, meaningful FPIC and respect for human rights. Land acquisition for LTWP was declared illegal by Kenya's Land and Environment Court in Meru.
4	Transparency & accountability (access to high-quality information & accountable, fair & transparent decision-making)	Pastoralist communities on whose lands LCE is produced often lack adequate and high-quality information, despite legal provisions that make adequate participation of local communities obligatory in all decisions that affect them.
5	Sustainability	Use of energy resources does not adequately consider depletion of energy and community development, thus may entrench marginalisation.
6	Intragenerational equity	Rights of access to energy services are fundamental but not fulfilled in practice.
7	Intergenerational equity	Plans are lacking for ensuring future generations' right to enjoy a good life undisturbed by damage from energy systems.
8	Responsibility (e.g. to protect environment & minimise threats related to energy use/ prod.)	Energy developers' responsibility to protect the natural environment is not strongly enforced, reinforced by the false narrative that pastoralists' livelihoods are detrimental to the environment and that large-scale LCE projects put the land to better use.
9	Resistance (e.g. to energy-related injustices)	Resistance by pastoralist communities may be strategically portrayed as ignorant and anti-developmental. However, it can prove effective – as in the case of LTWP. Resistance may focus on modes of incorporation, rather than outright rejection of large-scale LCE developments.
	Resistance to non-local meanings/impositions of Western-inspired EJ framing	Locally formulated framings integral to EJ as a meaningful concept, grounded in decolonial and place-based approaches; a foundational principle that may unsettle others listed here; shape priorities and trade-offs; and may encompass rejection of 'EJ' framing per se. For the LTWP case, pastoralist land-relations and their misrecognition, plus flawed consultation processes, shape local experiences and meanings of energy injustice.
10	Intersectionality (incorporation of recognitional justice; linking realisation of EJ to other forms of justice; meaningful FPIC)	EJ not yet viewed broadly or linked to other forms of justice such as social-economic or environmental justice. Recognition of indigenous identities, rights to meaningful FPIC not realised at LTWP. Meaningful FPIC linked to temporalities, politics of

(continued on next page)

⁴ 'Pastoralists' relationships with indigeneity is complex, shifting and place-specific, with groups such as Saami recognised as Indigenous Peoples (IP), whilst Mongolian pastoralists are typically not, and with discrepancies between recognition at national and international scales (Upton, 2014a).

Table 1 (continued)

#	Energy-justice principles (after Sovacool et al., 2017: 687; additions in bold)	Energy (in)justice in Kenya's drylands (authors)
		representation and genuine partnerships; rejection of tokenistic approaches epitomised in CSR.

Our Mongolian team recruited key informants through approaching all herding households around the Salkhit and Bukhug sites. All consented to be interviewed. A total of 11 in-depth interviews, including seven with female respondents, were conducted. A further four in-depth key-informant interviews were conducted with herders near Taishir HPP, in addition to interviews with local government staff and a hydropower expert linked to Taishir HPP.

Search Fields	Topic, title, abstract, keywords.
Search Strings	1. Pastoral livelihoods and environments: “pastoral*” OR “agropastoral*” OR “transhuman*” OR “nomad*” OR “herd*” OR “dryland*” OR “rangeland*” OR “grazing” OR “pasture” AND 2. Types of renewables/ LCE and transitions: “renewable energy” OR “renewable*” OR “green energy” OR “solar” OR “wind” OR “hydro*” OR “hydro-power” OR “green hydrogen” OR “energy transition” OR “just transition” OR “net zero” AND 3. FPIC, energy justice, consent, resistance, participation: “resist*” OR “conflict” OR “consultation” OR “consent” OR “FPIC” OR “land rights” OR “resource rights” OR “climate justice” OR “energy justice” OR “environmental justice” OR “extractivism” OR “governance” OR “participation” OR “court case”. In Scopus, searches were confined to dates 2000–2023, to subject areas ‘environmental science’, ‘social sciences’, ‘energy’ and ‘multidisciplinary’. Initial inclusion of ‘Agricultural and Biological Sciences’ did not yield any additional pertinent results, so was removed in the final searches. Searches were confined to articles and to English language sources. Complementary additional searches of grey literature were also conducted, as specified in Section 3.
Inclusion criteria	Article must explicitly look at (Search 1): the first part of the search operator string in relation to the second and third; i.e., be a pastoralism-related study, looking specifically at renewable/ lower-carbon energies and energy transitions and at issues of governance, justice, resistance, consent, cooperation; (Supplementary search 2): look at the first part of the search operator string in relation to the second i.e., be a pastoralism-related study, looking specifically at renewable/ lower-carbon energies and energy transitions, to ensure capture of pertinent cases where issues of justice, consent etc were not so prominent in abstracts (see Figure 2).
Exclusion criteria	Studies not in or primarily concerned with pastoral areas/pastoralism and large scale LCE (e.g. focusing on domestic energy systems, oil and gas extraction, renewables only amongst wider list of land use changes). Studies not addressing impacts or responses to LCE amongst pastoralists (e.g. focusing on technical aspects of LCE development, physical characteristics of rangelands e.g. soil structure, vegetation changes, impacts on biodiversity/livestock only, focusing on sedentary farmers and communities or where pastoralist experiences cannot be distinguished from a wider group (‘peasants’, ‘rural communities’).

Fig. 1. Search strings for pastoralism and impacts of large-scale LCE.

studies of Mongolia and Kenya (Section 5), policy documents, project reports and media sources.

Complementary empirical material was collected in Kenya and Mongolia in 2022 in a small, exploratory study, also analysed in Section 5. In Mongolia, we focused on Salkhit Wind Farm and Bukhug Solar Power Plant, Tuv *aimag*⁵ and Taishir Hydropower Plant (HPP), Govi-Altai, thus incorporating three key types of LCE. All were developed through foreign investment, in partnership with local operating companies. These sites reflect Government energy strategies and priorities, as encapsulated in the Mongolian State Policy on Energy (2015–2030), wherein an increased share of renewables in domestic energy generation, underpinned by private sector and donor investment, is key (Chinbat and Cabre, 2024; Jamsran, 2018).

In Kenya, we focused on Lake Turkana Wind Power (LTWP), a pioneer green-energy project in northern Kenya, and the largest wind-power production site in Africa, funded through private sources including international investment (e.g. Anergi Turkana Investments Limited, Osprey Renewables Africa, CFP UK Holdings Limited and Sandpiper Ltd). The selection of this project by local team members reflects its ostensible role as a ‘game changer’ in an area deprived of investment for decades and the subsequent controversy that has surrounded it: pastoralist communities contested LTWP’s land acquisition in court and a verdict in their favour nullified the title. As such, it exemplifies key EJ-related issues in the rollout of large-scale LCE infrastructure in pastoralists’ land and subsequent everyday livelihood impacts. LTWP has been well-documented, in media and academic debates (e.g. Drew, 2022, 2020; Lind and Rogei, 2025). This small study provides complementary insights into the production and experiences of energy (in)justice through the 4E framework.

⁵ Administrative subdivision in Mongolia; province.

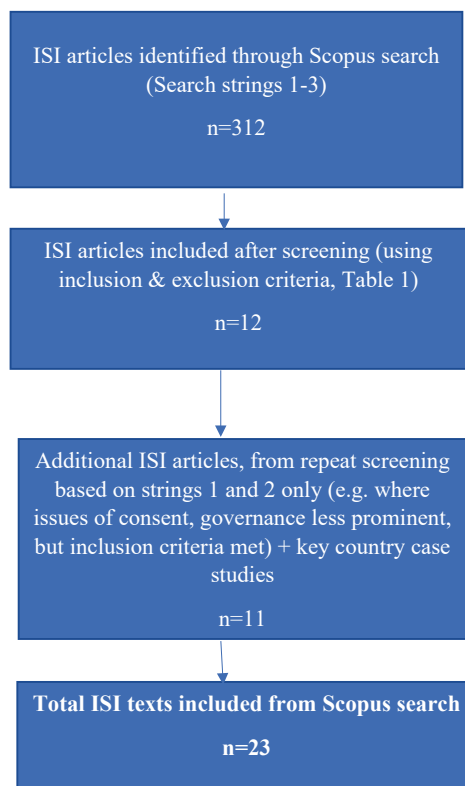


Fig. 2. Flow diagram of scopus search and review process.

Nine in-depth interviews were conducted in June 2022, with community members, grassroots organisations and community leaders recruited through the local teams' networks. In addition to being local residents from diverse pastoralist communities (e.g. Rendille, Samburu, Turkana), respondents were particularly involved in raising community concerns over EJ issues, with some involved in a court case against the investing companies.

For all sites, interviews were recorded, transcribed and subject to thematic analysis through the lens of EJ.

4. Political ecology of energy transitions in pastoral areas

4.1. Energy (in)justices: introduction

Pastoralists' encounters with green extractivism through large-scale LCE show critical justice-related commonalities across diverse geographies, cultures and contexts. Specifically, one or more of the intersecting '4E' processes are typically at play: for example, where LCE infrastructure restricts pastoralists' access to grazing lands [Enclosure], predominance of planning processes from which pastoralists are excluded or marginalised [Exclusion], and the worsening of pre-existing inequalities [Entrenchment], with these typically being linked and mutually reinforcing. We argue that these, and their attendant injustices, are shaped and enabled by the specificities of pastoralist cultures, livelihoods and landscapes, as explored below and drawing particularly on the desk-based analysis outlined in Section 3.

4.2. Producing and situating energy injustices

i) Pastoral lands and land rights: Physical characteristics such as predominance of high wind speeds and solar irradiance, particularly in drylands, position them as particularly attractive for large-scale LCE (Wario, 2022; Waters-Bayer and Wario, 2022). Land-use and land-rights issues compound vulnerability to green extractivism, wherein

prevalence of common property regimes and complex, flexible customary tenure facilitate 'land grabbing', with resultant constraints on mobility (Scoones, 2021; Shokrgozar and Sareen, 2025; Singh, 2022; Wachira et al., 2024). Numerous large-scale LCE projects, supported by both domestic and international investors, are being set up in pastoral areas without adequate prior and ongoing consultation with local land-users and without meaningful participation or FPIC (Szpak, 2019; Waters-Bayer and Wario, 2022). As Landauer and Komendantova (2018) argue, herders' participation in Environmental Impact Assessment (EIA) processes for windfarms in Finland remains 'tokenistic'. Cambou (2020) contends that in Sweden, internationally recognised rights to FPIC for Saami herders as IP and in the face of large-scale wind energy projects, are frequently sidelined at the national level, contra to demands of recognition and procedural justice. LaTosky (2021) concurs that FPIC has proved contentious in its implementation, due not only to resistance on the part of developers, but also profound differences in understandings of what constitutes meaningful consent, and to whom FPIC applies. In Africa, key conventions/ commitments include the African Commission's Africa Charter for Human and Peoples' Rights (ACHPR, 1986) and the UN Declaration on the Rights of Indigenous Peoples (UNDRIP, UN, 2007), both of which uphold the principle of FPIC. ACHPR did not confine this principle to IP in its 2012 resolution. Nonetheless, many governments fail to apply these principles in dealings with pastoralists, IPs and LCE, despite formal endorsement of these frameworks and conventions (Waters-Bayer and Wario, 2022).

Widespread discursive representation of pastureland by state actors and project developers as 'unproductive and undercapitalised in a market economy' further serve to facilitate dispossession and enclosure (Borras and Franco, 2018; Nysten-Haarala et al., 2021; Scoones, 2021; Stock, 2022: 5), and thus map onto distributive (in)justices. As Singh (2022) and Yenneti and Day (2016) highlight for wind power expansion in India, government-led designation of 'wastelands' in spaces used by local pastoralists enabled just such de facto dispossession, framed as integral to progress and 'modernity'; a phenomenon also highlighted by Stock and Birkenholtz (2021). Discursive representations both of pastoralists and pastoral lands thus facilitate both enclosure and exclusion (Achiba, 2019; Scoones, 2021). Distributive injustices have also been widely experienced through pastoralists' exclusion from LCE generated on their lands, often compounded by loss of access to natural sources of energy (e.g. firewood) on that same land. Pastoralists thus become victims of not only 'land grabbing' but also 'energy grabbing' (Stock, 2021; Stock and Birkenholtz, 2021).

ii) Mobilities, histories and marginalisation: Pastoralists often lack power in RE negotiations, reflecting wider historical and political marginalisation, particularly for mobile pastoralists, who typically constitute minority groups in more sedentary societies (Scoones, 2021; Yaffe and Segal-Klein, 2023; Waters-Bayer and Wario, 2022). Contemporary green extractivism feeds on this in several ways. Pastoralists' historical and ongoing marginalisation undermines their ability not only to retain/secure land access, but also to contest strategic 'wasteland' discourses. This may facilitate processes of not only enclosure, through 'green grabbing' and (accumulation by) dispossession (Achiba, 2019; Hughes and Rogei, 2020; Karam and Shokrgozar, 2023), but also exclusion, wherein procedural and recognitional injustices are served by misrecognition and misrepresentation, as highlighted for LTWP (Section 5, below). Seasonal mobilities also facilitate further marginalisation and enclosure through enabling lands to be viewed as 'empty' in particular periods, and through rendering pastoralists absent during official 'consultations' (Achiba, 2019; Hughes and Rogei, 2020). Whilst this may be read as distributive injustice, we argue that it is also reflective of ontological injustices, whereby pastoralists' relations with land and their spatially and temporally complex systems of land use are poorly served by Western-inspired EJ frameworks. Fjellheim (2023a), argues that for Norway's Fosen Vind wind project, struggles between protagonists over land rights are simultaneously struggles over diverse knowledges, truths and worldviews, and hence produce divergent understandings of the

project's impacts on local Saami livelihoods and cultures; an issue also central in the Oyfjellet windfarm case (Fjellheim, 2023b).

Overall, processes not only of enclosure but also exclusion in green extractivism are facilitated by particularities of pastoralist livelihoods, histories and engagements with land. These factors are further compounded by lack of formal recognition of pastoralist organisations by many governments. Exceptions may occur where a country's ratification of International Labour Organization (ILO) Convention 169 and/or UNDRIP have enabled pastoralist organisations to successfully appeal to the UN Special Rapporteur on Indigenous Issues, as in the case of the planned Kalvvatnan Wind Farm, Norway, cancelled in 2016 before construction began (Nysten-Haarala et al., 2021). This can be linked to important advances such as in the subsequent Fosen Vind case, where Norway's Supreme Court ultimately ruled in favour of the Saami in 2021 (Fjellheim 2023a; Karam and Shokrgozar, 2023). As of 2024, following protests over lack of implementation of the ruling, settlement agreements have been reached enabling the wind farm's continued operation for 25 years, with compensation and future vetos for Saami. Despite these advances, the often-fragmented nature of LCE planning processes continues to contribute to marginalisation of pastoralists' rights, whilst simultaneously placing great demands on them: as Osterlin and Raitio (2020: 104) argue, "the actor with least resources has to have the broadest expertise, in order to be able to maintain an overview and to effectively seek influence". Flawed consultation processes are often evident and may subsequently become a focus for emergence of resistance, as discussed in the case of LTWP below (Achiba, 2019).

It is also notable that land acquisition for LCE compounds ongoing changes in pastoral areas. Pastoral land enclosure and resultant fragmentation are widely reported e.g. across Africa and linked to decreases in resilience and increases in intracommunity inequalities (Lind et al., 2020; Scoones, 2021). The rising demand for land for LCE serves to further these processes of entrenchment, whilst also emphasising the importance of place-based histories and specificities in shaping production of energy injustices. This is explored further for our case studies below, including through the agency of pastoralist actors in the context of 'economies of anticipation', wherein new opportunities for accumulation can be exploited by some, but not by others (Drew, 2022).

4.3. Dimensions of energy injustice

Energy injustices produced through the processes outlined above can be considered in relation to Western-inspired EJ formulations. Distributive injustices are most readily apparent, albeit intersecting with procedural and recognitional injustices, through powerful discursive misrepresentations of pastoralists' lands and livelihoods and through flawed, tokenistic consultation procedures that limit pastoralists' attendance and voice. In addition, large-scale LCE developments in pastoralist communities are typically in breach of a number of the EJ principles proposed by Sovacool et al. (2017) (Table 1, Section 5.2). Principle 1) availability: communities rarely gain access to energy generated on their land; this also mitigates against realisation of Principle 2) affordability. Principle 3) due process – linked to meaningful FPIC and procedural justice – is rarely fulfilled. Following from this, Principle 4) transparency and accountability, is typically lacking. As pastoralist communities themselves rarely have access to these energy sources, then Principles 5 (sustainability) and 6 (intergenerational equity) are not fulfilled and prospects for Principle 7 (intergenerational equity) may be undermined. A number of cases show resistance to overt energy injustices (Principle 9). Sovacool et al. (2017) highlight Principle 9 in particular as a way in which their framework addresses the Western-centric dimensions of much EJ literature. It was evident in the sources we examined that pastoralists were often unaware of their own rights and/or ways in which they could legally oppose energy projects or negotiate benefits. However, in well-documented cases in Kenya (LTWP) and Norway (Kalvvatnan and Fosen), pastoralists – with appropriate legal support – did manage to take governments and developers to court

and win concessions (Waters-Bayer and Wario, 2022). However, forms of resistance are complex and place-specific, contra simplistic 'oppositional narratives'; reflecting local 'economies of anticipation' and contested modes of incorporation (Drew, 2022; Lind et al., 2020). We also argue that the principle of 'resistance' (Principle 9) needs not only to incorporate opposition to energy injustices, but also to more explicitly address the formulation of what constitutes EJ and local resistance to non-Western meanings and impositions; as argued by Tornel (2023a: 47), in Sovacool et al.'s (2017) framework, in common with much 'mainstream' EJ scholarship, "environment' and 'justice' remain largely defined through Western ways of thinking".

For Principle 10, intersectionality, energy-related injustices frequently map onto and exacerbate pre-existing marginalisation of pastoralist communities, while deepening intracommunity inequalities (e.g. around gender, as argued by Stock and Birkenholtz, 2020). This principle also links to indigenous identities and the (flawed) implementation and diverse meanings of consent under FPIC.

These issues and interconnections are explored further for the Kenyan and Mongolian case studies below.

5. Kenya and Mongolia Case Studies

5.1. 'Green energy' transitions: Kenyan contexts

Kenya is arguably amongst the most progressive countries in Africa in respect of energy transitions, with some 90% of its electricity generated from LCE sources (IEA, 2024). Impacts of frequent droughts on hydropower provision have seen increased investment in geothermal, solar and wind energy (Hughes and Rogei, 2020; IEA, 2024; Renkens, 2019). This has placed Kenya's drylands – a formerly neglected frontier – at the centre of social-economic aspirations as outlined in Kenya's Vision 2030, and contributes to realisation of its Nationally Determined Contributions (NDCs), wherein 44% of planned greenhouse gas (GHG) emissions cuts are linked to reforms in energy supply and to Kenya's potential to attract 'green industry' (IEA, 2024; Republic of Kenya, 2012a,b).

Historically, investments in Eastern Africa's drylands have often been undertaken with limited reference to pastoralists' rights and livelihoods (Fratkin, 2014; Gebeyehu and Abbink, 2022; Lesorogol and Lesorogol, 2024; Scoones, 2021). Only in recent years did the Kenyan Government initiate policy developments to begin to address this historical marginalisation (Achiba, 2019; Elmi and Birch, 2013). The revised Constitution (2010) recommended legal reforms through various land-related laws, whilst the subsequent Community Land Act (CLA, Republic of Kenya, 2016) provided a legal framework for recognition, protection and registration of customary tenure rights (Republic of Kenya, 2016). However, despite apparent legislative progress, irregular land acquisition persists in pastoral drylands, including in relation to large-scale LCE (e.g. Achiba, 2019; Cormack and Kurewa, 2018; Hughes and Rogei, 2020; Otieno, 2025). The Government of Kenya's failure to sign up to UNDRIP (UN, 2007) is a factor in many companies' alleged disregard for FPIC principles therein (Cormack and Kurewa, 2018).

5.2. Energy justice: LTWP Kenya

Some 9% of Kenya's 57 million population continue to rely on pastoralist livelihoods, particularly in arid and semi-arid lands (ASALs), which occupy 80% of the country's land area. Patterns of pastoralists' mobility are highly variable, with seasonal movements increasingly challenged by changing climates and resource availability, in addition to longstanding issues with state policies, marginalisation, conflict and land alienation.

The "powerful legitimising discourse of green transition" and its implementation through projects such as LTWP contribute to green extractivism and alienation of pastoral lands (Dunlap et al., 2025: 545;

Lind and Rogei, 2025), whilst exhorting pastoralists not to hinder 'progress' (Danwatch, 2016; Wario, 2022). Examples of enclosure are readily apparent in LCE projects, often without compensation for displaced parties (Hughes and Rogei, 2020; Mariita, 2002). The legislative framework facilitating these trends includes the Land Value Act (Republic of Kenya, 2019), which bases valuation on conventional real-estate and asset-valuation approaches, with adverse implications for prospects of meaningful compensation (Cormack and Kurewa, 2018; Makathimo, 2019; Osano, 2021; Waters-Bayer and Wario, 2022).

For LTWP, processes of enclosure are apparent through the initial land acquisition, whereby 150,000 acres (61,000 ha) of land were leased by Marsabit County Council to LTWP in 2006/7, effectively converting public, Trust land into private land, in a process subsequently deemed unlawful (Yaffe and Segal-Klein, 2023). Effects were downplayed by developers (e.g. LTWP, 2011). According to the Environmental and Social Impact Assessment (ESIA) report (World Bank, 2009): "the project area will not be fenced (with the exception of the power substation), and the pastoralists can access the project area for grazing purposes and settlement". Leased areas were also represented by LTWP lawyers as uninhabited, thus strategically deploying tropes of investible 'terra nullius' and facilitating enclosure (Achiba, 2019; Cormack and Kurewa, 2018; Waters-Bayer and Wario, 2022).

The initial land alienation nonetheless impacted local pastoralist communities; as a Rendille elder elaborated in our interviews:

"even if the communities are allowed to graze the animals in the project area, they are not happy to settle or move freely within the project area because the land does not belong to them anymore.... As it seems, this is only a language used by the project to cover up of the takeover of the land."

A youth from Loyangalani concurred that:

"the project has now employed security officers, so the people do not have the freedom to move and graze anyhow or freely or even settle where they want. Remember that vehicles are also running here and there, and there's a lot of movement of vehicles, so you know where this has also affected grazing patterns."

Other informants emphasised impacts on livestock:

"where the turbines are erected, there is no vegetation that grows there because the wind blows everything away. They also scared animals away because they could not stand the noise that comes from the turbines".

Noise and air pollution, in conjunction with deterioration in vegetation quality, were thus highlighted as rendering important grazing areas and access routes unusable. Enclosure in this case operates not only through formal changes in property rights, but by more subtle means through changes in livestock behaviour, human perceptions, land degradation and changing microclimates, underpinned by misrecognition of pastoralist norms.

Established patterns of land use and access were therefore disrupted through capture of resources and authority by LTWP developers, even where pastoralists were not physically excluded, producing new, distributive injustices. These processes of exclusion are underpinned by marginalisation of local relationships with land and place, despite overt recognition of seasonal mobility in LTWP documents. In addition, Rendille pastoralists have long protested the loss of sacred sites, an unresolved point of contention, whilst the relocation of Sarima village has, according to key informants, contributed to rupturing of traditional relations with land and enhanced sedentarisation of relocated communities, occasioning conflict. Enclosure was typically experienced and realised in conjunction with processes of encroachment, for example through adverse impacts on natural environments, as highlighted above.

Enclosure is also closely linked to exclusion, through allegedly unfair planning, lack of representation in decisions and policymaking and lack of respect for due process. As a local pastoralist youth argued:

"We were only involved when the project started, that's when the turbines were all moved to the site, the construction work began, and the resettlement of the people in Sarima began."

Achiba (2019) and Renkens (2024) concur that LTWP's community consultations were flawed. This fed into lack of compensation for affected parties, while implementation of FPIC was notably lacking. The LTWP Stakeholder Engagement Plan of 2014 sought to justify this omission by arguing that local Turkana, Rendille and Samburu pastoralists were not indigenous and therefore that "the principle of FPIC is not currently considered to be applicable ..."; a conclusion at odds with internationally accepted definitions of indigeneity and with self-identification by these groups (Renkens, 2024; Cormack, 2019). Interviewees commonly highlighted an absence of meaningful consultation:

"As far as I'm aware, there was no adequate consultation that took place as most of the meetings were conducted from a top-bottom approach and the communities did not have full information..... Therefore it is clear that the communities did not give their FPIC especially with regards to the land acquisition." (Rendille elder, June 2022).

For local interviewees, meaningful consent entailed not only attention to temporalities (e.g. ongoing engagement throughout the project process) (Renkens, 2024), but also to issues of representation. As argued by one informant:

"the project had...only handpicked a few partisan individuals as "community representatives" and this was totally against the spirit of the Kenyan laws and international good practices.... the community should be left to democratically choose the people they want to represent them in the process of negotiating with the project...."

It was notable that the often 'tokenistic' nature of consent and FPIC was rejected by respondents, who emphasised the importance of a radical rebalancing of power, grounded in recognition of their rights, and contra to externally defined corporate social responsibility (CSR) offerings:

"we are not squatters on our land, we don't want CSR but we also want to own shares in the company and do serious business with them.... We are the landowners. The wind is ours. What do they bring? ...we are not against the project, we believe the land is ours and we believe we are equal..." (Rendille elder, June 2022).

Thus, responses were characterised by concern with modes of incorporation and recognition of rights therein, rather than outright rejection (Lind and Rogei, 2025).

In further considering processes of exclusion, pre-existing ethnic conflicts over natural resources were allegedly exploited by project developers to de-emphasise some claims over others and to shape consultation practices (Achiba, 2019). LTWP presence and actions also reportedly led to increased intensity of intercommunal division and conflict (Lind and Rogei, 2025; Renkens, 2019).

Local communities also argued that the project had created new and exacerbated existing inequalities, especially with regards to provision of jobs and CSR investment projects. As observed by an elder in Loiyan-galani in 2022:

"the project seems to favour only one community. If you ask the people who are now employed by the wind power, you will find out that most of them are coming from Samburu community."

Thus, aspects of exclusion also feed further entrenchment, through widening inequalities between pastoralist groups and exacerbating tensions and conflicts.

Co-option of engagement processes between LTWP and local communities emerged as another aspect of exclusion and linked to intra-community divisions. For example, according to one elder:

"Community Liaison Officers [CLOs] are paid by the company to represent their interests and they have as a result impacted on the ability

of their respective communities to express their grievances against the project”.

This echoes [Drew \(2020\)](#), who documents how local protests against CLOs were driven by pastoralists’ perceived exclusion from meaningful consultation and from project benefits. In the case of LTWP, local communities have no direct access to the power produced from their lands, employment opportunities are few and these are subject to capture by local elites.

Thus, already existing uneven patterns of development are exacerbated, with benefits such as energy provision remaining unaffordable or inaccessible to already marginalised pastoralist communities. Uncertain tenure rights remain a major influence on how communities are engaged and their land acquired for investment projects. It is vital here, however, to recognise the importance of diverse terms of engagement and incorporation, and the ways these may evolve over time, for example, in relation to ‘economies of anticipation’ and contra to ideas that local rights can be settled as a ‘one off’ at project start up ([Drew, 2022: 160; Renkens, 2024](#)). As observed by [Lind et al. \(2020\)](#), local outcomes of investments are not shaped by states or global capital alone, but moulded by local actors, their agency and their strategic, including anticipatory, action. For LTWP, [Drew \(2022\)](#) highlights how key actors drew on previous experiences of rural investment projects to attempt to secure rights to land and other resources, in anticipation of future investment. Processes of entrenchment may thus, whilst exacerbating overall inequalities within a community, reflect the emergence of new elites, who are better able to negotiate changing contexts and opportunities. In other words, entrenchment may be deepened and reshaped by ‘economies of anticipation’ and the modes of incorporation sought and secured by different pastoralists.

Overall, the majority of the ten justice principles are not fulfilled ([Sovacool et al., 2017](#)): [Table 1](#).

Due process, transparency and accountability emerge as particularly important EJ principles, whose lack of observance drives an array of other injustices. While Kenya has robust laws anchored in the Constitution, implementers of LCE projects often do not follow due process in acquisition of land. Kenya’s Public Participation Act ([Republic of Kenya, 2019](#)) provides for indiscriminatory participation in every decision that affects lives of the citizens. However, some LCE developers have avoided full compliance, instead relying on a basic semblance of participation and on compromise by state regulators. Furthermore, some developers have relied on the flawed argument that FPIC does not apply because Kenya is not a signatory to the UNDRIP ([Renkens, 2019](#)), while approaches to FPIC elsewhere fail to reflect local understandings of what constitutes meaningful consent.

In cases such as LTWP, where the land-acquisition process was declared illegal, it is evident that, in accordance with Principle 9, community organising and active resistance may advance common demands of pastoralist communities, where these exist, and with due regard to intracommunity differences.

When considered in relation to classic tripartite EJ justice concerns, all three emerge as critical and as undermined here. Following [Tornel \(2023a\)](#), it is also evident that locally meaningful justice is linked to place-based relations of local communities with their land and thus to diverse values and ontologies that elude capture in this tripartite framework and were not fully reflected in the original ten EJ principles. Whilst monetary benefits mattered to communities, according to our respondents, some resisted what [Tornel \(2023b\)](#) terms ‘inclusionary control’, through articulation of rights and responsibilities as traditional land and resource custodians and in accordance with specific relational understandings of land, contesting the limitation of justice to superficial, ‘transactional’ forms. Thus, Principle 9 is expanded here to explicitly emphasise the formulation of ‘EJ’ and resistance to imposed norms and definitions.

5.3. ‘Green-energy’ transitions: Mongolian Context

Mongolia aims to fully meet national energy demands and become an energy exporter by 2040 ([State Great Khural of Mongolia, 2020](#)). In 2023, 9% of Mongolia’s electricity was derived from LCE, with the remainder primarily from coal-fired plants ([Chinbat and Cabre, 2024; Energy Regulatory Commission of Mongolia \(ERCM\), 2021](#)). Mongolia’s development policies, including its National Green Development Policy (2014), Nationally Determined Contribution (2019) and Vision 2050 (2021), set a target to reduce emissions by 22.7% by increasing the share of LCE by up to 30% of national production by 2030. Whilst the Mongolian government’s “100,000 Solar Ger Program”, has enhanced individual household-scale energy provision, large-scale LCE is the focus of recent national-scale initiatives. National energy regulations such as Laws on Energy (in 2001), Renewable Energy (in 2007 and 2019) and National Program on Energy (2015–30) provide the framework to achieve these goals. As of 2024, Mongolia’s LCE is derived from seven hydropower plants (HPPs), three wind farms (WFs) and nine solar-power plants (SPPs). HPPs are located primarily in the western provinces, while SPPs and WFs dominate in the Gobi and in some central regions ([Khyargas, 2023](#)). Overall, the LCE potential of Mongolia has marked it out as a key future producer, ripe for RE-focused green extractivism, and attracting both domestic and international interest and investment (*ibid*). Recently announced partnerships with EBRD look set to rapidly scale up wind and solar LCE sites by 2028 ([Reuters, 2025](#)).

Mongolia faces numerous obstacles in achieving large-scale LCE-related goals, including funding, internal politics, local protests and Russian geopolitical interests ([Odkhuu, 2022](#)). Within Mongolia, the continuing importance of pastoralist livelihoods, both culturally and economically, ostensibly places pastoralists in a less marginalised position than in the Kenyan case ([Oniki et al., 2025](#)). Nonetheless, experiences of land alienation through mining, conservation and sedentary agricultural production have shaped pastoralists’ livelihood struggles since decollectivisation ([Upton, 2014b, 2016](#)). The rapid, ongoing expansion of large-scale LCE can be seen as the latest chapter in these struggles, wherein the conjunction of complex, collective land rights, seasonal mobilities and physical characteristics of local environments simultaneously marginalise pastoralists’ voices and facilitate green extractivism. In October 2021, herders protested in the capital, Ulaanbaatar, against the planned Erdeneburen HPP ([Sonin.mn, 2021](#)) and flooding of pasturelands, seasonal camps and hay areas. Public feedback was divided, with media commentators arguing for national interest to take priority over “a few herders’ rights”, thus echoing the concept of ‘acceptable sacrifices’ ([Stock, 2022: 12](#)), some supporting herders’ efforts to protect customary rights, and a minority accusing the HPP project of insufficiently consulting with local herders ([Byambatsogt, 2021](#)). LCE transitions in contemporary Mongolia are thus being shaped by both geopolitical and domestic concerns and developmentalist discourses, with EJ impacts recently coming into focus.

5.4. Energy justice: Mongolia

In recent decades, rangeland allocation for infrastructure and government-determined ‘special uses’, mining and agriculture, in conjunction with land degradation and climate change, have constrained pasture availability. In this context, disputes between herders and LCE developers may be predicted, not least as herders still rely largely on de facto customary land rights to pasture, which is officially state property, and may have little defence against land alienation for LCE. However, the few published accounts to date suggest limited evidence of grassroots resistance. According to [Waters-Bayer and Wario \(2022\)](#), all LCE projects in Mongolia are officially classified as having no impact on IPs, given that herders do not typically self-identify in this way and that associated safeguards are therefore officially deemed inapplicable. Available reports on specific LCE projects are primarily written by or for project developers and conclude that there are no

negative impacts on herders, although their voices and perspectives – including perceptions of justice – are typically lacking (ibid). Our small-scale pilot study is one step towards addressing this omission.

Despite formal changes in land tenure, few herders at study sites reported significant loss of pasture access:

“We are not adversely affected. The pasture, water and salt are all in good condition. We got used to living with this solar station. ... The station does not affect grazing and migration. It occupies a small area.” (Male herder, Khushig Khundii solar station).

For those located near HPP developments, processes of enclosure had potentially greater effects, but again generated little resistance, contra reports of adverse impacts from Tashir HPP elsewhere (e.g. [Dugersuren, 2022](#)):

“I lived right next to the place where the lake was going to be built.... At that time, they informed me that my three seasonal grazing areas were within the construction site, so we were warned about issues arising from that. At first, I did not feel good because I thought that we had a problem with our pastures and the winter camp. However, the issues were not as severe as I thought. the most difficult thing was that we lost some summer pastures. Nevertheless, now we adjusted and do not have any problems with it.” (Female herder, Tashir HPP).

Overall, while there are clearly cases of transfer of assets into private hands, respondents’ perspectives suggest a lack of significant perceived impact on pastoralists’ livelihoods and grazing areas thus far through processes of exclusion and for the few, modest-scale projects included. As one herder stated in relation to HPP:

I don’t know much about the legal regulations, but in the matter of pastures for my livestock, I can freely go to my own land, so I think it’s enough to protect our rights.’

Seasonal mobilities and relations with land, contra the experiences of Kenyan herders around LTWP, appear relatively untroubled by LCE infrastructures and enclosures to date, facilitated by more flexible norms of access to summer pastures, within which LCE infrastructures were typically located. LCE developments were also evaluated by respondents in relation to their more pressing concerns over impacts of planned transport infrastructure and urban development. However, there are clear issues of scale here: more extensive planned LCE projects, such as the 28,000 ha Chinese-backed Erdeneburen HPP project in western Mongolia, due to become operational in 2026, will impact some 270 herding households and flood 28,000 ha of land, prompting sustained, organised resistance and protest, and headlines accusing Mongolia of choosing “profit over humans and nature” ([Dugersuren, 2022](#); [Bayarlkhagva, 2024](#); [Khaikin, 2024](#):1). Affected herders already challenged Erdeneburen HPP in 2021, marked by mobilisation around potential impacts on livelihoods, land rights and biodiversity ([Dugersuren, 2022](#); [EJ Atlas, 2022](#)). According to [Dugersuren \(2022\)](#), a Mongolian human rights activist, the ESIA report for the site is flawed and local communities were not properly consulted.⁶ They may thus be deemed subject to both enclosure and exclusion. Others highlight the discursive representation of protestors as anti-developmental and ‘sabotaging national economic interests’, linked to criminalisation of activists and concerns over ‘path dependency’ of government approaches to large-scale LCE and justice issues in the future ([Bayarlkhagva, 2024](#); [Khaikin, 2024](#)).⁷

For the existing sites included in our study, interviewees reported

limited consultation with local communities at the beginning of LCE projects, though not all participated in these events.

“Yes, I did go there ... They gave us information and warned us to protect our livestock from large trucks while they were building the wind farm. I guess, thanks to such information, people got a better understanding. So, there was no opposition.” (Male herder, Salkhit WF)

This appeared to constitute information-sharing on the part of companies, rather than more active participation and consultation. Regarding FPIC, Environment Impact Assessment (EIA) reports indicate that local herders’ consent was obtained but, during interviews, herders were not always clear about what they signed. Nonetheless, our small sample provided little evidence of perceptions of exclusion by these communities, nor associated processes of entrenchment. Indeed, some herders living close to Tashir HPP reported benefits through increased access to water and a moister microclimate created in surroundings of the HPP’s reservoir.

“Now we have something that we enjoy: Gegeen Lake. We are living on the shore of a lake and have a stream (coming) down. You can say, it impacted me positively.” (Female herder, Tashir HPP)

We reviewed Mongolia’s LCE development applying the amended EJ framework (after [Sovacool et al., 2017](#)): ([Table 2](#))

Thus, in Mongolia as in Kenya, due process, transparency and accountability appear key, with conflicting accounts of the nature of participation and extent of ‘consultation’. For the case-study sites, interviews suggested limited adverse impacts of enclosure, despite some evidence of exclusion. It is notable that, in all three Mongolian cases, initial community reactions were mostly negative, but – for our informants at least – perspectives changed following provision of information and when actual impacts on grazing were seen to be minimal. Herders’ own growing access to household-scale solar energy also shaped reactions, as did energy access from large-scale LCE for extended families in nearby settlements. Thus, availability, affordability and intragenerational equity to some extent appear to have offset flaws in relation to Principles 3 and 4 to date and for our cases and informants. Resistance, Principle 9, is however, emerging most notably in relation to Erdeneburen HPP and to these same perceived flaws and injustices. Discursive representations also have a role to play here, with media and public discourses allegedly seeking to undermine protests, through accusing protesters of opposing national interests. This discursive strategy impacts on prospects for contesting decisions that adversely affect pastoralist justice and wellbeing.

6. Discussion

Consideration of EJ in pastoralist landscapes through a critical PE lens highlights processes of enclosure, exclusion and entrenchment as integral to shaping justice outcomes. In analysis of a range of global cases, the 4Es framework ([Sovacool, 2021](#)) helps uncover how energy injustices are produced in relation to the specific characteristics of pastoralist livelihoods, landuse and environments. In particular, insecure land tenure, discursive representations of ‘terra nullius’ and wastelands, often also facilitated by extensive, mobile land use, enable enclosure and produce distributive injustices. Cases across diverse LCE types and geographies showed commonalities in this respect. Exclusion, linked with procedural injustices, is similarly facilitated by common pastoralist livelihood characteristics of mobility and marginalisation. Even in cases where protagonists have recognised IP status, FPIC is frequently contested and often sidelined at a national level ([Cambou, 2020](#)), enabling continued exclusions and injustices. Underpinning these processes are ontological injustices, whereby pastoralists’ relations with land and their spatially and temporally complex systems of land use are poorly served by Western-inspired liberal EJ frameworks. Struggles over land rights are therefore also struggles over diverse knowledges, competing truths and worldviews ([Fjellheim, 2023a,b](#)).

⁶ In response, the Government made a commitment to compensate every affected household over 15 million tugriks (Government Resolution No. 146 of 6 April 2022).

⁷ Sukhgerel Dugersuren was named by organisations such as Frontline Defenders as subject to government investigation and facing arrest, as of August 2022, while the Erdeneburen HPP case has garnered critical attention from organisations such as Rivers Without Boundaries (transrivers.org).

Table 2
Energy justice principles and energy (in)justice in Mongolia.

#	Energy-justice principles (Sovacool et al., 2017: 687, additions in bold)	Energy (in)justice in Mongolia's pasturelands (authors)
1	Availability	Energy produced by large-scale LCE projects supplies population in nearby districts and towns, although some affected herders cannot directly access the energy. Access via 100,000 Solar Gers Program focusing on micro solar more widespread.
2	Affordability	Energy is affordable for much of the population, who have access because of state-regulated tariff policy.
3	Due process	Conflicting, limited evidence on this. Energy developers' own and official reports suggest that due process is followed for large-scale LCE. Recent resistance, especially to planned developments, highlights challenges. Lack of independent data problematic.
4	Transparency and accountability	Our study suggests local communities impacted by the case-study LCE projects do receive information, yet 'consultations' are limited in scope, e. g. in relation to involvement in decision-making and inclusion of all community members.
5	Sustainability	Energy authorities reported increased energy efficiency in production, but state-regulated tariffs do not allow cost recovery of the sector, increasing state debt for energy investment. Availability of energy to local settlements indicates some consideration of community development. Impacts on local environments of planned LCE developments are a focus for emergent resistance.
6	Intragenerational equity	Equal rights to access energy services for herders are being addressed primarily through micro, household-level rather than large-scale LCE, e.g. the 100,000 Solar Gers Program specifically targeted mobile herders and reports provision of household-level solar electricity to over 70% of herders (World Bank, 2013). Herders may not have direct access to energy generated by large-scale LCE, but extended kinship networks in local towns may benefit.
7	Intergenerational equity	National LCE regulations and action plans up to 2050, and as part of the SDGs, highlight future generations' right to enjoy good life and access to energy services. However, protests around planned large-scale LCE developments indicate challenges over intergenerational equity for herders.
8	Responsibility	According to EIA reports, energy developers' responsibility to protect the natural environment and human rights seems to be duly enforced. However, the quality of EIAs has been questioned, and emergent resistance to particular projects indicates concerns over full and fair discharge of responsibilities.
9	Resistance	Official accounts suggest herders are consulted and compensated for losses in relation to large-scale LCE projects. However, limited documentation highlights emergence of resistance

Table 2 (continued)

#	Energy-justice principles (Sovacool et al., 2017: 687, additions in bold)	Energy (in)justice in Mongolia's pasturelands (authors)
	Resistance to non-local meanings/impositions of Western-inspired EJ framing	and challenges these claims. Planned large-scale LCE, e.g. Erdeneburen HPP, highlight potential for increased impacts and scaling up of injustices and resistance in future. For case-study sites, place-based norms of seasonal land use and land relations shape herders' livelihoods. Where large-scale LCE sites are located in summer pastures, flexibility in land use has mitigated against significant tensions or perceptions of injustice to date amongst respondents. As with the Kenya case, however, this principle remains foundational. EJ not yet viewed broadly or linked to other forms of justice such as social-economic or environmental. Meaningful FPIC critical in future as LCE and EJ related challenges scale up.
10	Intersectionality (incl. <i>meaningful FPIC</i>)	

The Kenyan case study (Section 5) further demonstrates that while elements of 'mainstream' tripartite EJ formulations retain some analytical traction, deeper attention to place-based lived experiences of large-scale LCE, and to non-western justice norms is vital. The LTWP case highlights how entrenchment was not just about deepening pre-established lines of exclusion, but about creation of new fractures and shifting power relations, linked to economies of anticipation. Enclosure and resultant distributive injustices were shaped not only by physical land alienation, but also by non-human (livestock) responses to new infrastructures and by human perceptions and emotions. Drawing on both the desk-based global and empirically-informed case studies we thus argue that injustices are underpinned by marginalisation of local relationships with land and place, reinforcing the need to move beyond Western-defined EJ frameworks and the 'condescending hospitality of FPIC' (Tornel, 2023b), and towards more relational, place-based understandings of justice, grounded in diverse ontologies.

FPIC emerges as typically tokenistic in its execution, despite its potential for more transformative applications. Sovacool et al. (2023:3) frame FPIC as foundational to indigenous energy justice. In practice, while cases exist in which pastoralists have been able to contest LCE-related processes of enclosure and exclusion, these remain the exception, with FPIC often ignored, or conflated with limited participation and information-sharing. As such, it may function as a 'bureaucratic trap' (Dunlap, 2018), or 'façade of dialogue' (Tornel, 2023b). Lack of locally meaningful consent remains inimical to realisation of diverse – including locally determined, place-based – manifestations of EJ. The Kenyan case also highlights the importance of examining shifting governance arrangements and temporal dynamics, including 'economies of anticipation' and claims that arise during project implementation, not only at the planning stage (Renkens, 2024). These dynamics often better capture pastoralist engagements with LCE than simplistic oppositional narratives (Lind and Rogei, 2025).

Application of Sovacool et al.'s (2017) original 10-point EJ framework further illustrates how injustices are produced for pastoralists, particularly around due process (Principle 3), linked to a lack of transparency and accountability (Principle 4). Pastoralists' typically limited access to new LCE sources combined with the effects of enclosures and encroachment, also undermine sustainability, and intra- and intergenerational equity. That said, understanding of place-based specificities remains vital: our analysis of Kenyan and Mongolian cases highlights different trade-offs between EJ principles, grounded in diverse policy regimes, pastoralists' histories of marginalisation and recent experiences of energy or large-scale 'development' interventions amongst a

range of other factors. For both Kenyan and Mongolian cases, transparency and accountability appear key, with conflicting accounts of the nature of participation and ‘consultation’, particularly in the latter case. For Mongolian respondents, growing access to household-scale solar energy, in conjunction with access for extended families in nearby settlements to energy generated through large-scale LCE infrastructure, moderated perceptions of injustice. Thus, availability, affordability and intragenerational equity to some extent appeared to have offset flaws in relation to due process and procedural justice for our Mongolian cases and informants.

Local resistance to perceived energy injustices (Principle 9) emphasises the agency of pastoralists, while complicating simplistic binary narratives of acceptance and opposition (Lind et al., 2020). However, we are duly cognisant of Tornel’s (2023a) critique, who asserts that this 10-point framework continues to be grounded largely in Western-inspired thinking. Dunlap and Tornel (2023) further warn that attempts to pluralise EJ may risk incorporating critical perspectives and positionalities into dominant capitalist, statist and extractivist energy development paradigms. Our findings suggest that for EJ to remain a useful analytical lens when considering pastoralist encounters with LCE, it must foreground diverse place-based, relational and ontological dimensions. In this respect, ‘resistance’ should extend beyond opposition to specific injustices to encompass challenges to imposed, universalised notions of justice, grounded instead in diverse values, knowledges and lifeworlds. As highlighted by Menton et al. (2020), mainstream environmental justice, on which much earlier EJ scholarship draws, has expanded to encompass critical, ecological and decolonial variants, the latter in particular challenging the ‘epistemic violence’ occasioned by imposition of Western justice norms. Our analysis underscores that ‘different imaginaries of justice’ (ibid: 1625), are equally central to realisation of any meaningful EJ for pastoralists. The ‘4Es’ framework has enabled us to highlight ways in which processes of enclosure, exclusion, encroachment and entrenchment produce injustices beyond the distributive, procedural and recognitional. As noted by Dunlap et al (2024a), these classic ‘tripartite’ concerns did retain some traction with local informants. However, they were wholly insufficient to fully capture pastoralists’ lived, place-based experiences and aspirations.

7. Conclusion

Stock (2022: 3–4) recently described large-scale LCE projects as the ‘sine qua non of techno-managerial solutions to the climate crisis’, wherein imperatives for climate-change mitigation enable unjust and exploitative interventions. As institutionalised responses to the ‘climate emergency’, they exemplify aspects of green extractivism. This paper has demonstrated that the particularities of pastoralist livelihoods and landscapes render them especially vulnerable to green extractivism and ‘green grabbing’ for large-scale LCE, and thus to energy-related injustices, shaped by enclosure, exclusion, encroachment and entrenchment. Across cases, common patterns are evident, but so too is the importance of recognising pastoralists’ own meanings and experiences of justice. These findings reinforce the need to move beyond narrow, universalised EJ frameworks toward approaches that engage with place-based meanings, diverse ontologies and historically embedded power relations. In doing so, the paper contributes to ongoing debates on the relationship between environmental and energy justice, highlighting the need to more fully integrate critical and decolonial perspectives in analyses of LCE. Sovacool et al’s (2025) ‘complex EJ framework’ is an important step here, in its evaluation of the intersectionality, dynamism and fluidity of injustices, grounded in reintegration of critical aspects of environmental and EJ. Such multi-dimensional understandings, the authors argue, are integral to attempts to prevent future injustices and may help to identify critical leverage points supporting moves towards decolonial, equitable energy futures.

The current momentum around the IYRP offers just such a critical opportunity for new thinking, leadership and priorities around LCE and

EJ to develop and solidify; in other words for moves towards pastoralist-led decision-making, grounded in diverse ontologies, contesting incorporation into existing institutions and grounded in decolonial EJ. Further collaborative and pastoralist-led work is needed to develop detailed, place-based and longitudinal understandings of these ongoing encounters between LCE and heterogeneous pastoralist societies and to explore pathways towards more locally defined, energy-just futures.

Funding sources

This work was supported by Leicester Institute of Advanced Studies (LIAS) Seedcorn Grant, Project No. P13ED37.

CRediT authorship contribution statement

Caroline Upton: Writing – review & editing, Writing – original draft, Visualization, Resources, Project administration, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Abdikadir Kurewa:** Writing – review & editing, Writing – original draft, Methodology, Investigation. **Tungalag Ulambayar:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Formal analysis, Conceptualization. **Hussein Tadicha Wario:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Ann Waters-Bayer:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization.

Acknowledgements

We would like to thank the Leicester Institute for Advanced Studies (LIAS), University of Leicester, UK for funding in support of this work and Batmunkh Turmunkh for their role in Mongolian fieldwork and data collection. We would particularly like to thank all our research participants at study sites in Kenya and Mongolia for contributing their time and expertise.

Data availability

Data is not shared to protect informant confidentiality and in line with ethical requirements and procedures.

References

- Achiba, G., 2019. Navigating contested winds: development visions and anti-politics of wind energy in Northern Kenya. *Land* 8 (1). <https://doi.org/10.3390/land8010007>.
- Alvarez, L., Coolsaet, B., 2018. Decolonizing environmental justice studies: a Latin American perspective. *Capital. Nat. Social.* 31 (2), 50–69. <https://doi.org/10.1080/10455752.2018.1558272>.
- Bayarlkhagva, M., 2024. Erdeneburen Dam in Mongolia belies China’s promise of a ‘sustainable, green BRI’. *Rivers Without Boundaries*, Feb 15th, 2024. <https://www.transrivers.org/2024/3911/>.
- Boateng, D., Bloomer, J., Morrissey, J., 2023. Where the power lies: developing a political ecology framework for just energy transition. *Geogr. Compass.* <https://doi.org/10.1111/gec3.12689>.
- Bontempi, A., Reyes Maturanao, I., Sanchez Archeo, J., Diaz, R., 2025. Defending the territory by the rules: the role of environmental law in Yucatan’s renewable energy conflict. *Geoforum* 161. <https://doi.org/10.1016/j.geoforum.2025.104243>.
- Borras, S., Franco, J., 2018. The challenge of locating land-based climate change mitigation and adaptation policies within a social justice perspective: towards an idea of agrarian climate justice. *Third World Q.* 39 (7), 1308–1325. <https://doi.org/10.1080/01436597.2018.1460592>.
- Bruna, N., 2022. A climate-smart world and the rise of green extractivism. *J. Peasant Stud.* 49 (4), 839–864. <https://doi.org/10.1080/03066150.2022.2070482>.
- Byambatsogt, S., 2021. The Erdeneburen HPP does not conflict with Russian interests rather it’s an issue of Mongolia’s energy independence. *Ulaanbaatar News*.
- Cambou, D., 2020. Uncovering injustices in the Green transition: Sámi rights in the development of wind energy in Sweden. *Arctic Rev. Law Politics* 11, 310–333. <https://doi.org/10.23865/arctic.v11.2293>.
- Chinbat, B., Cabre, M., 2024. Solar and wind power in Mongolia: 2024 policy overview. Stockholm Environment Institute (SEI) Policy Brief, October 2024. solar-and-wind-power-in-mongolia-2024-policy-overview-sei2024-046.pdf.

- Cormack, Z., 2019. How Kenya's mega windpower project is hurting communities. Conversation. <https://theconversation.com/how-kenyas-mega-wind-power-project-is-hurting-communities-122061>.
- Cormack, Z., Kurewa, A., 2018. The changing value of land in Northern Kenya: the case of Lake Turkana Wind Power. *Critical African Studies* 10 (1), 89–107. <https://doi.org/10.1080/21681392.2018.1470017>.
- Danwatch, 2016. A people in the way of progress: prostitution, alcoholism and a lawsuit on illegal land acquisition in the Lake Turkana Wind Power Project. Danwatch, Copenhagen <http://old.danwatch.dk/en/undersogelse/a-people-in-the-way-of-progress/>.
- De Lemos, G., Eslabao, A., Dos Santos, J., Rodrigues, A., Da Costa, L., De Medeiros Costa, H., Faga, M., Dos Santos, E., 2024. Nature-based solutions experiences: a systematic literature review for public policies. *Nature-Based Solut.* 5, 100121. <https://doi.org/10.1016/j.nbsj.2024.100121>.
- Drew, J., 2022. Protest, middlemen and everyday meanings of place: reconceptualising the scramble for East Africa's drylands. *J. Eastern Afr. Studies* 16 (1), 160–179. <https://doi.org/10.1080/17531055.2022.2070303>.
- Drew, J., 2020. Meanings of place and struggle for inclusion in the Lake Turkana Wind Power Project. In: Lind, J., Okenwa, D., Scoones, I. (Eds.), *Land Investment and Politics: Reconfiguring Eastern Africa's Pastoral Drylands*. James Currey, New York, pp. 66–77, 10.2307/j.ctvhrjct.
- Dugersuren, S., 2022. Opinion: Still time to rethink Mongolia's biggest dam to date. *Dialogue Earth* <https://dialogue.earth/en/energy/opinion-still-time-to-rethink-mongolias-erdeneburen-hydropower-plant/>.
- Dunlap, A., Sovacool, B., Novacovic, B., 2025. 'A Dead Sea of solar panels': solar enclosure, extractivism and the progressive degradation of the California desert. *J. Peasant Stud.* 52 (3), 539–573. <https://doi.org/10.1080/03066150.2024.2388051>.
- Dunlap, A., Sovacool, B., Novacovic, B., 2024a. 'Our town is dying': Exploring utility-scale and rooftop solar energy injustices in Southeastern California. *Geoforum* 156, 104120. <https://doi.org/10.1016/j.geoforum.2024.104120>.
- Dunlap, A., Verweijen, J., Tornel, C., 2024b. The political ecologies of "green" extractivism(s): an introduction. *J. Polit. Ecol.* 31 (1), 436–463. <https://doi.org/10.2458/jpe.6131>.
- Dunlap, A., Tornel, C., 2023. Pluralising energy justice? Towards cultivating an unruly, autonomous and insurrectionary research agenda. *Energy Res. Soc. Sci.* 103217. <https://doi.org/10.1016/j.erss.2023.103217>.
- Dunlap, A., Marin, D., 2022. Comparing coal and 'transition materials'? Overlooking complexity, flattening reality and ignoring capitalism. *Energy Res. Soc. Sci.* 89, 102531. <https://doi.org/10.1016/j.erss.2022.102531>.
- Dunlap, A., 2018. "A bureaucratic trap": free, prior and informed consent (FPIC) and wind energy development in Juchitán, Mexico. *Capital. Nat. Social.* 29 (4), 88–108. <https://doi.org/10.1080/10455752.2017.1334219>.
- Elmi, M., Birch, I., 2013. Creating policy space for pastoralism in Kenya. *Future Agricultures Working Paper 068*. Institute of Development Studies, Brighton https://opendocs.ids.ac.uk/articles/report/Creating_Policy_Space_for_Pastoralism_in_Kenya/26444143?file=48186841.
- Energy Regulatory Commission of Mongolia (ERCM), 2021. Statistics on energy performance. ERCM, Ulaanbaatar, Mongolia <https://erc.gov.mn/en/news/877>.
- Environmental Justice Atlas. 2022. Erdeneburen Hydropower Plant Project, Mongolia. <https://ejatlas.org/conflict/erdeneburen-hydropower-plant-project-mongolia>.
- Fjellheim, E., 2023a. Wind energy on trial in Saepmie: Epistemic controversies and strategic ignorance in Norway's green energy transition. *Arctic Rev. Law Pol.* 14, 140–168. <https://doi.org/10.23865/arctic.v14.5586>.
- Fjellheim, E., 2023b. "You can kill us with dialogue": critical perspectives on wind energy development in a Nordic-Saami green colonial context. *Hum. Rights Rev.* 24, 25–51. <https://doi.org/10.1007/s12142-023-00678-4>.
- Fratkin, E., 2014. Ethiopia pastoralist policies: development, displacement and resettlement. *Nomadic Peopl.* 18 (1), 94–114. <https://doi.org/10.3197/np.2014.180107>.
- Fressoz, J.-B., 2017. There is no energy transition. *Breakthrough J.* 7, 22–31.
- Garcia, M., Mayer, A., Johansen, I., Lopez, M., Moran, E., 2024. Spatial injustice to energy access in the shadow of hydropower in Brazil. *World Dev.* 178, 106570. <https://doi.org/10.1016/j.worlddev.2024.106570>.
- Gebeyehu, A., Abbink, J., 2022. Land, sugar and pastoralism in Ethiopia: comparing the impact of the Omo-Kuraz sugar projects on local livelihoods and food (in)security in the lower Omo Valley. *Pastoral. Res. Policy Pract.* 12, 32. <https://doi.org/10.1186/s13570-022-00242-8>.
- Heffron, R., Sokolowski, M., 2024. Resolving energy policy failure: introducing energy justice as the solution to achieve a just transition. *Energy Policy* 187, 114042. <https://doi.org/10.1016/j.enpol.2024.114042>.
- Hughes, L., Rogei, D., 2020. Feeling the heat: responses to geothermal development in Kenya's Rift Valley. *J. Eastern Afr. Stud.* 14 (2), 165–184. <https://doi.org/10.1080/17531055.2020.1716292>.
- International Energy Agency (IEA). 2024. Kenya 2024 energy policy review. <https://iea.blob.core.windows.net/assets/98bc7ce1-b22d-48c9-9ca2-b668ffbf4cb/Kenya2024.pdf>.
- Jamsran, J., 2018. Energy sector of Mongolia; country report. Government of Mongolia Ministry of Energy (Presentation). <https://eneken.ieej.or.jp/data/8044.pdf>.
- Jenkins, K., McCauley, D., Heffron, R., Stephan, H., Rehner, R., 2016. Energy justice: a conceptual review. *Energy Res. Soc. Sci.* 11, 174–182. <https://doi.org/10.1016/j.erss.2015.10.004>.
- Karam, A., Shokrgozar, S., 2023. "We have been invaded": Wind energy sacrifice zones in Åfjord Municipality and their implications for Norway. *Norsk Geografisk Tidsskrift – Norw. J. Geogr.* 77 (3), 183–196. <https://doi.org/10.1080/00291951.2023.2225068>.
- Khaikin, L. 2024. In the renewable race, Mongolia chooses profit over humans and nature. *Fair Planet*, 2 March 2024. <https://www.fairplanet.org/story/in-the-renewable-race-mongolia-chooses-profit-over-humans-and-nature/>.
- Khyargas, T., 2023. Reference study on renewable energy in Mongolia since 1990. Karakoram Center for Sustainable Development, Gilgit-Baltistan, Pakistan.
- Knuth, S., Bershin, I., Levenda, A., McCarthy, J., 2022. New political ecologies of renewable energy. *EPE Nat. Space* 5 (3), 997–1013. <https://doi.org/10.1177/2514846221108164>.
- LaTosky, S., 2021. Customary land use and local consent practices in Mun (Mursi): a new call for meaningful FPIC standards in Southern Ethiopia. In: Gabbert, C., Gebresenbet, F., Galaty, J., Schlee, G. (Eds.), *Lands of the Future: Anthropological Perspectives on Pastoralism, Land Deals and Tropes of Modernity in Eastern Africa*. Berghahn Books, New York, pp. 268–291.
- Lake Turkana Wind Power Project (LTWP). 2011. Updated Environmental and Social Impact Assessment summary. Nairobi. <https://www.eib.org/attachments/registers/53222536.pdf>.
- Landauer, M., Komendantova, N., 2018. Participatory environmental governance of infrastructure projects affecting reindeer husbandry in the Arctic. *J. Environ. Manage.* 223, 385–395, 10.1016/j.jenvman.2018.06.049.
- Lang, M., Manahan, M., Bringel, B. (Eds.), 2024. *The Geopolitics of Green Colonialism: Global Justice and Ecosocial Transitions*. Pluto Press, London.
- Lesorogol, C., Lesorogol, P., 2024. Community-based wildlife conservation on pastoral lands in Kenya: a new logic of production with implications for the future of pastoralism. *Hum. Ecol.* 52, 15–29. <https://doi.org/10.1007/s10745-024-00482-9>.
- Lind, J., Rogei, D., 2025. Contestation, conflict and claims-making around the Lake Turkana Wind Power windfarm, northern Kenya. *World Dev.* 188, 106913. <https://doi.org/10.1016/j.worlddev.2024.106913>.
- Lind, J., Okenwa, D., Scoones, I., 2020. Introduction: the politics of land, resources and investment in Eastern Africa's pastoral drylands. In: Lind, J., Okenwa, D., Scoones, I. (Eds.), *Land Investment and Politics: Reconfiguring Eastern Africa's Pastoral Drylands*. James Currey, New York, pp. 1–32.
- Makathimo, M. 2019. Report on valuation of community rangelands in Kenya. Drylands Learning and Capacity Building Initiative (DLCI), Nairobi, Kenya. <https://dli-hoa.org/wp-content/uploads/2023/05/20200804042811688.pdf>.
- Mariita, N., 2002. The impact of large-scale renewable energy development on the poor: environmental and socio-economic impact of a geothermal power plant on a poor rural community in Kenya. *Energy Policy* 30 (11–12), 1119–1128. [https://doi.org/10.1016/S0301-4215\(02\)00063-0](https://doi.org/10.1016/S0301-4215(02)00063-0).
- McCauley, D., Ramasar, V., Heffron, R., Sovacool, B., Mebratu, D., Mundaca, L., 2019. Energy justice in the transition to low carbon energy systems: exploring key themes in interdisciplinary research. *Appl. Energy* 233–234, 916–921. <https://doi.org/10.1016/j.apenergy.2018.10.005>.
- Menton, M., Larrea, C., Latorre, S., Martinez-Alier, J., Peck, M., Temper, L., Walter, M., 2020. Environmental justice and the SDGs: from synergies to gaps and contradictions. *Sustainability Science* 15, 1621–1636. <https://doi.org/10.1007/s11625-020-00789-8>.
- Mulvaney, D., 2024. Embodied energy injustice and the political ecology of solar power. *Energy Res. Soc. Sci.* 115, 103607. <https://doi.org/10.1016/j.erss.2024.103607>.
- Nysten-Haarala, S., Joona, T., Hovila, I., 2021. Wind energy projects and reindeer herders' rights in Finnish Lapland: a legal framework. *Elementa* 9 (1). <https://doi.org/10.1525/elementa.2020.00037>.
- Odkhuu, D., 2022. The loan for Erdeneburen River HPP is the most significant, with the multiplying benefit to Mongolia. *Ulaanbaatar News*.
- Oniki, S., Dagys, K., Sakamoto, G., 2025. Communal resource management, morality, and economic development: a case of pastureland management in Mongolia. *Agric. Hum. Values* 42, 1739–1756. <https://doi.org/10.1007/s10460-025-10722-3>.
- Osano, A., 2021. Indigenous peoples and renewable energy projects in Kenya. *Ogiek Peoples' Development Program, Nakuru, Kenya* <https://repository.nrf.go.ke/handle/123456789/352>.
- Osterlin, C., Raitio, K., 2020. Fragmented landscapes and planscapes – the double pressure of increasing natural resource exploitation on indigenous Sámi lands in northern Sweden. *Resources* 9 (9), 104. <https://doi.org/10.3390/resources909104>.
- Otieno, G., 2025. Transforming goat pastoralism in Kenya: off-taker innovations in Kajiado and their implications for sustainable agriculture in Africa. *AIB Insights*. <https://doi.org/10.46697/001c.138728>.
- Page, M., McKenzie, J., Bossuyt, P., Boutron, I., Hoffmann, T., Mulrow, C., Shamseer, L., Tetzlaff, J., Akl, E., Brennan, S., Chou, R., Glanville, J., Grimshaw, J., Hróbjartsson, A., Lalu, M., Li, T., Loder, E., Mayo-Wilson, E., McDonald, S., McGuinness, L., Stewart, L., Thomas, J., Tricco, A., Welch, V., Whiting, P., Moher, D., 2021. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021 (372), n71. <https://doi.org/10.1136/bmj.n71>.
- Ramirez, J., Bohm, S., 2021. Transactional colonialism in wind energy investments: energy injustices against vulnerable people in the Isthmus of Tehuantepec. *Energy Res. Soc. Sci.* 78, 102135. <https://doi.org/10.1016/j.erss.2021.102135>.
- Renkens, I., 2024. Mind the gap: conflicts in the implementation of Kenya's Lake Turkana Wind Power project. *Forum Dev. Stud.* 51 (3), 517–542. <https://doi.org/10.1080/08039410.2024.2351879>.
- Renkens, I., 2019. The impact of renewable energy projects on indigenous communities in Kenya. *International Work Group for Indigenous Affairs, Copenhagen* <https://www.iwigia.org/en/resources/publications/3535-the-impact-of-renewable-energy-project-on-indigenous-communities-in-kenya.html/>.
- Republic of Kenya. 2019. Land Value (Amendment) Act. <http://kenyalaw.org/kl/fileadmin/pdfdownloads/AmendmentActs/2019/LandValueAmendmentAct2019.pdf>.
- Republic of Kenya. 2016. Community Land Act. <https://new.kenyalaw.org/akn/ke/act/2016/27/eng@2022-12-31>.

- Republic of Kenya, 2012a. Releasing our full potential. Sessional Paper No. 8 of 2012 on National Policy for the Sustainable Development of Northern Kenya and Other Arid Lands <https://repository.kippira.or.ke/server/api/core/bitstreams/896337f6-bd1c-490d-bc18-e80116c383f5/content>.
- Republic of Kenya, 2012b. Kenya Vision 2030. Sessional paper No. 10 of 2012. <https://vision2030.go.ke/wp-content/uploads/2018/05/Sessional-paper-No.-10-of-2012-On-Kenya-Vision-2030.pdf>.
- Reuters, 2025. Mongolia, EBRD partner to advance renewable energy. <https://reuters.com/business/energy/mongolia-ebrd-partner-advance-renewable-energy-2025-01-21/>.
- Scoones, I., 2021. Pastoralists and peasants: perspectives on agrarian change. *J. Peasant Stud.* 48 (1), 1–47. <https://doi.org/10.1080/03066150.2020.1802249>.
- Shokrgozar, S., Sareen, S., 2025. Mitti se sona [gold from dirt]?: solar India and colonial modernity in agropastoral Rajasthan. *World Dev.* 192, 107028. <https://doi.org/10.1016/j.worlddev.2025.107028>.
- Shokrgozar, S., Remme, D., Stock, R., 2024. 'We have to convince them whatever it takes': the climate necropolitics of energy transitions in India and Zambia. *Geoforum* 153, 103905. <https://doi.org/10.1016/j.geoforum.2024.103945>.
- Singh, D., 2022. 'This is all waste': emptying, cleaning and clearing land for renewable energy dispossession in borderland India. *Contemporary South Asia* 30 (3), 402–419. <https://doi.org/10.1080/09584935.2022.2099812>.
- Sonin.mn, 2021. Herders from Uvs aimag protested the construction of Erdeneburen Hydropower Station. Available in Mongolian at <https://www.sonin.mn/news/enews/125392>.
- Sovacool, B., Dunlap, A., Novakovic, B., 2025. When decarbonisation reinforces colonisation: complex energy injustice and solar energy development in the California desert. *Ann. Assoc. Am. Geogr.* 115 (3), 640–670. <https://doi.org/10.1080/24694452.2024.2433040>.
- Sovacool, B., Bell, S., Daggett, C., Labuski, C., Lennon, M., Naylor, L., Klinger, J., Leonard, K., Firestone, J., 2023. Pluralizing energy justice: incorporating feminist, anti-racist, Indigenous, and postcolonial perspectives. *Energy Res. Soc. Sci.* 97, 102996. <https://doi.org/10.1016/j.erss.2023.102996>.
- Sovacool, B., 2021. Who are the victims of low-carbon transitions? Towards a political ecology of climate change mitigation. *Energy Res. Soc. Sci.* 73, 101916. <https://doi.org/10.1016/j.erss.2021.101916>.
- Sovacool, B., Burke, M., Baker, L., Kotikalapudi, C., Wlokas, H., 2017. New frontiers and conceptual frameworks for energy justice. *Energy Policy* 105, 677–691. <https://doi.org/10.1016/j.enpol.2017.03.005>.
- State Great Khural of Mongolia, 2020. Vision-2050 – Long-term Development Policy of Mongolia. Ulaanbaatar, Mongolia.
- Stock, R., Birkenholtz, T., 2024. Tracking the sun: exposing India's solar dispossessions. *Globalizations* 1–20. <https://doi.org/10.1080/14747731.2024.2327882>.
- Stock, R., Sovacool, B., 2024. Blinded by sunspots: revealing the multidimensional and intersectional inequities of solar energy in India. *Global Environ. Change* 84, 102796. <https://doi.org/10.1016/j.gloenvcha.2023.102796>.
- Stock, R., 2022. Power for the plantationocene: solar parks as the colonial form of an energy plantation. *J. Peasant Stud.* 50 (1), 162–184. <https://doi.org/10.1080/03066150.2022.2120812>.
- Stock, R., 2021. Illuminant intersections: injustice and inequality through electricity and water infrastructures at the Gujarat Solar Park in India. *Energy Res. Soc. Sci.* 82, 102309. <https://doi.org/10.1016/j.erss.2021.102309>.
- Stock, R., Birkenholtz, T., 2021. The sun and the scythe: energy dispossessions and the agrarian question of labor in solar parks. *J. Peasant Stud.* 48 (5), 984–1007. <https://doi.org/10.1080/03066150.2019.1683002>.
- Stock, R., Birkenholtz, T., 2020. Photons vs. firewood: female(dis)empowerment by solar power in India. *Gender Place Culture* 27 (11), 1628–1651. <https://doi.org/10.1080/0966369X.2020.1811208>.
- Szpak, A., 2019. Relocation of Kiruna and construction of the Markbygden wind farm and the Saami rights. *Polar Science* 22, 100479. <https://doi.org/10.1016/j.polar.2019.09.001>.
- Tornel, C., 2023a. Decolonising energy justice from the ground up: political ecology, ontology and energy landscapes. *Prog. Human Geogr.* 47 (1), 43–65. <https://doi.org/10.1177/03091325221132561>.
- Tornel, C., 2023b. Energy justice in the context of green extractivism: perpetuating ontological and epistemological violence in the Yucatan Peninsula. *J. Polit. Ecol.* 30 (1), 846–873. <https://doi.org/10.2458/jpe.5485>.
- Upton, C., 2016. Contesting development: pastoralism, mining and environmental politics in Mongolia. In: Horowitz, L., Watts, M. (Eds.), *Grassroots Environmental Governance: Community Engagements with Industry*, Chapter 8. Routledge, London. <https://doi.org/10.4324/9781315649122>.
- Upton, C., 2014a. The new politics of pastoralism: Identity, justice and global activism. *Geoforum* 45, 207–216. <https://doi.org/10.1016/j.geoforum.2013.11.011>.
- Upton, C., 2014b. Communities, culture and commodification: Mongolia's new resource politics. *Inner Asia* 16 (2), 252–274. <https://doi.org/10.1163/22105018-12340018>.
- Van Uffelen, N., Taebi, B., Pesch, U., 2024. Revisiting the energy justice framework: doing justice to normative uncertainties. *Renew. Sustain. Energy Rev.* 189, 113974. <https://doi.org/10.1016/j.rser.2023.113974>.
- Wachira, J., Atela, J., Stacey, P., Outa, G., 2024. NGO-led community-based conservation: a new frontier of territorialization with implications for pastoralists' land tenure and climate change adaptation. *Land* 13 (6), 740. <https://doi.org/10.3390/land13060740>.
- Wario, H., 2022. Making green energy safe for pastoralists. Project Syndicate. <https://www.project-syndicate.org/commentary/green-energy-land-grabs-hurt-pastoralists-by-hussein-tadicha-wario-2022-05>.
- Waters-Bayer, A., Wario, H., 2022. Pastoralism and large-scale renewable energy and green hydrogen projects – potentials and threats. *Brot für die Welt und Heinrich Böll Foundation, Berlin* <https://www.boell.de/sites/default/files/2022-05/Pastoralism-and-large-scale-REnewable-energy-and-green-hydrogen-projects.pdf>.
- World Bank, 2009. Lake Turkana Wind Power: Environmental and Social Impact Assessment Study Report. World Bank, Washington DC <https://documents1.worldbank.org/curated/pt/149151468272057129/pdf/E29100v10EA0P10updated0Windfarm0ESIA.pdf/>.
- World Bank, 2013. *Mongolia: Portable Solar Power for Nomadic Herders*. World Bank, Washington DC. <https://worldbank.org/en/results/2013/04/08/portable-solar-power-for-nomadic-herders>.
- Yaffe, N., Segal-Klein, H., 2023. Renewable energy and the centralisation of power: the case study of Lake Turkana Wind Power, Kenya. *Polit. Geogr.* 102, 102819. <https://doi.org/10.1016/j.polgeo.2022.102819>.
- Yenneti, K., Day, R., 2016. Distributional justice in solar energy implementation in India: the case of Charanka solar park. *J. Rural Studies* 46, 35–46. <https://doi.org/10.1016/j.jrurstud.2016.05.009>.
- Zurba, M., Madge, C., Bullock, R., Gibson, A., Barraclough, L., Papadopoulos, A., Hahmeed, A., Nash, P., 2026. Highlighting the positive outcomes for communities and researchers along the spectrum of community-engaged research. *Geoforum* 173, 104641. <https://doi.org/10.1016/j.geoforum.2026.104641>.
- United Nations, 2007. United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Resolution A/RES/61/295. https://www.un.org/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf (accessed 2 January 2026).