



Original article

Displaced by the transition: The political ecology of climate change mitigation, displacements and Lithium extraction in Zimbabwe

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ABSTRACT

Decarbonization initiatives depend heavily on the sustainable supply of critical raw materials. Such a high dependency on critical minerals drives their urgent sourcing. However, this urgent extraction of critical minerals for the low-carbon energy transition induces severe social impacts including different types of displacements: i.e. physical, cultural and economic. Demand for critical minerals is expected to surge in the coming decades, and so are these displacement trends. Communities located on or nearer to critical minerals deposits are increasingly becoming exposed to these displacements, but there is limited problematization of such forced relocation trends that negatively impact communities, socio-economically and culturally. Detailed case studies of displacements induced by the haste to extract critical minerals are scant. The displacement problem is categorized under the “S” of the ESG risks, and it has not been adequately conceptualized- within the energy transitions field- to understand its full-scale. The “speed” to extract these minerals drives us to rethink mining induced displacement and resettlement (MIDR) by considering how this urgency may protract displacement impacts. Using the political ecology of climate change mitigation framework, this article analyses multidimensional displacements resulting from the accelerated extraction of critical minerals with special reference to the lithium case in Zimbabwe. In Zimbabwe, lithium extraction is inducing multidimensional displacements in some regions where it has been discovered. Evidence indicates that these displacements are implemented with no due diligence and in the absence of adequate processes of consultation and consent leaving communities impoverished. The paper provides recommendations for improving the resettlement practices and achieving *resettlement with development* that improves the lives of affected communities within the energy transition agenda.

1. Introduction

Since the Paris Agreement, which was adopted by 196 parties at the UN Climate Change Conference (COP 21) in 2015, the transition from the use of fossil fuels (such as coal, oil and gas) to clean energy sources (wind, solar, hydro and electric vehicle [EV] batteries) is increasingly gaining momentum. The overarching goal of the agreement was to limit the global average temperature increase to below 1.5 above preindustrial level. The agreement is a legally binding international treaty on climate change; and member countries are increasingly putting efforts to reach these set decarbonization targets. Other members states, such as Australia and the United Kingdom, are targeting net zero emissions by 2050. This urgent need to decarbonize induce a rush for the extraction of the critical minerals (CMs) required to produce energy transition technologies.

The exploration, extraction and sourcing of critical minerals is occurring on lands and waters where peasants and Indigenous

communities have varied forms of tenure, interests and the right to negotiate (Boafo et al. 2024; Matanzima and Loginova 2024; Zhou and Brown, 2024). Estimates indicate that more than half of the critical minerals resource base is located on or nearer to lands of Indigenous and peasant peoples (Owen et al. 2023). Thus, these groups of people bear the brunt of social and environmental impacts that are inherent in the accelerated extraction of critical minerals. Studies have shown that the extraction of critical minerals is associated with serious human rights abuses including, child labour, sexual assault against women, displacements, poor safety and health, labour injustices, violence and conflicts (Boafo et al. 2024; Matanzima 2024; Sovacool, 2021). These social impacts lay bare the unjust characteristics of the energy transition, in which upstream (or mining) communities are impacted and mostly downstream (or end-user) communities receive benefits (Heffron, 2020). Such a trend of injustices within the energy transition agenda represents a “decarbonization divide” or “green colonialism” (Dorn 2022; Sovacool et al. 2020). As such, it has been equated to past colonial

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forms of extractive injustices that underdeveloped global south countries and enriched western major powers (Hine et al., 2023).

The displacement of communities residing on or nearer to critical mineral deposits is one of the notable social impacts of the urgent critical mineral extraction. Prior studies consider displacement as one of the human rights risks associated with the energy transition (Boafo et al. 2024; Matanzima and Loginova 2024; Sovacool et al. 2020). Kramarz et al. (2021) offer a critical typology of displacement that can be used to understand the socio-economic and environmental effects of onshore wind, solar photovoltaics (PV), and lithium-ion batteries. Their assessment focuses mainly on the displacements occurring in the downstream of the value chains, i.e. the end users. In their study, they identified three broad types of displacement: a) displacement by dispossession; b) displacement by degradation; c) displacement through commodity-dependent development. These three broad types of displacement overlap with the main tenets of the political ecology of climate change mitigation framework. While drawing lessons from Kramarz et al. (2021), this study emphasizes displacements occurring upstream in the regions where critical minerals [in this case lithium] are extracted. There is evidence of communities being displaced due to lithium extraction within the jurisdictions with high concentration of the resource. However, most of the data exist in news media reports by such organisations as Human Rights Watch, Amnesty International and Business and Human Rights Resources Centre.

However, what is missing is adequate theorization of the displacement problem as it occurs within the decarbonization agenda. Displacement is a problem that needs to be addressed as it disempowers and impoverish human communities in the short- and long- term (Matanzima 2022). Within the mining field, extractive activities can induce multidimensional displacements, culminating in cumulative impacts that are experienced by multiple generations. As well, such displacements can have long-lasting consequences on people's cultures and identities (Arronson and Price 2024; Matanzima 2023) creating communities with altered identities. Critical minerals extraction is a new turn that produces complex resettlement issues. The critical minerals turn offers a new critical reading for understanding and broadening the resettlement social science field; and this article demonstrates how. As well, there are very limited case study analyses of the displacements induced by the urgent extraction of critical minerals. Many studies offer a general overview of the displacement issues (and impending resettlements) across the regions where these minerals are distributed (Boafo et al 2024; Owen et al. 2023; Owen et al. 2022). Case studies are crucial in that they provide evidence-based data with policy implications. They also provide site specific granularities required by resettlement policy makers to understand the complexity and full scale of the problem within specific nations and at a global scale.

This article considers the displacement and resettlement induced by the extraction of critical minerals. Specifically, it focuses on the Zimbabwe's case, to elucidate the different forms of displacement- i.e. cultural, economic, and physical- induced by the extraction of lithium. The paper details the impacts of these forms of displacements as they produce varied negative effects for impacted communities. There are several regions in Zimbabwe with lithium deposits (see Table 3). In these sites, either mining is underway upon areas where communities have already been displaced or where displacements are impending.

The paper commences by a critical review of the displacement literature in Section 2. The aim of the review is to identify gaps and contextualize the study. This is followed by Section 3 which focuses on the speed to extract minerals and conventional MIDR Section 4 provides steps taken to obtain data for the Zimbabwe cases presented. Section 5 then discusses the displacements occurring in Zimbabwe's lithium mines predicating on the political ecology of climate change mitigation framework. In conclusion, the paper connects the findings with the much broader resettlement and displacement debates. This last section also emphasizes the significance of this article and provides recommendations for responsible sourcing of lithium that minimizes

displacements. Further, when and where resettlement is unavoidable, the paper suggests methods for carrying out *resettlement in ways that leave communities better off, socio-economically, than they were before.*

2. Forced displacement and resettlement

Displacement entails the forced removals of communities from their lands and waters upon which they hold different forms of tenure. Displacement can be a) physical: being relocated from one space to another; b) economic: being restricted access to water and land for livelihood and income generation purposes; c) cultural: denied access to cultural assets or removed from centres of cultural heritage. Through its Environmental and Social Framework (ESF) (ESF, 2016), the World Bank which is the largest lender of development projects that result in resettlement recognises that different forms of land acquisition, restrictions to land use and resettlement can have adverse impacts on communities. Thus, physical, economic and cultural displacements, if unmitigated, can induce impoverishment risks. As stated in the ESF (2016: 53):

production systems may be dismantled; people face impoverishment if their productive resources or other income sources are lost; people may be relocated to environments where their productive skills are less applicable and the competition for resources greater; community institutions and social networks may be weakened; kin groups may be dispersed; and cultural identity, traditional authority, and the potential for mutual help may be diminished or lost.

These severe impacts of displacement can be experienced by multiple generations within the affected communities. In a few cases- like the Kariba Dam, Three Gorge Dams and Bui Dam- that have been subjects of longitudinal research, resettlement impacts have been experienced up to the second and third generations (Aronson and Price 2024; Matanzima 2022, 2024a; Wilmsen and Adjartey, 2020; Wilmsen 2016).

Throughout history, communities have been displaced for different factors including infrastructure development, establishment of free trade and special economic zones, creation of protected areas, extractive industries, agribusiness, disasters and climate change, and wars and armed conflict (Partridge and Halmo 2020; Matanzima 2022). However, detailed social science studies regarding socio-cultural impacts of displacements only emerged in the mid-20th century with the groundbreaking research carried out by Elizabeth Colson and Thayer Scudder on the social impacts of the Kariba resettlement induced by the construction of the Kariba Dam in the 1950s (Colson, 1960, 1971; Scudder, 1962, 2005, 2019). These earlier studies were followed by other detailed case studies of resettlement based on social science research, for example, the resettlement impacts of the construction of such dams as Akosombo Dam in Ghana constructed in the 1960s (Chamber 1970; Bronkesh and Scudder 1968) and the Chico River Dams in Philippines (Drucker 1985).

Based on the knowledge generated from these classical cases studies, the World Bank which was the domineering funder of dam projects created the resettlement policies that were aimed at guiding projects that involved resettlement in order to mitigate or avoid the social impacts that they induced (Partridge and Halmo 2020). The first policy, known as the Operational Manual Statement (OMS 2.33) guidelines, were established in 1980. These were continuously updated, reviewed and renamed to Operational Policy Note (OPN) 10.08 in October 1986; to the Operational Directive (OD 4.30) issued in June 1990 and later the Operational Policy/ Bank Procedures OP/BP 4.12) issued in the late 1990s. In the 2010s, the bank issued the IFC (2012) and the ESF (2016) which are currently the latest. All these policies were aimed at improving the ways in which resettlements were planned and implemented. Furthermore, these policies were continuously updated to reflect the realities on the ground. Despite all this advancement in resettlement policy and theory, problems persist as reported in many contemporary resettlement cases induced by infrastructure

developments and mining (Huckleberry 2024; Rogers and Wilmsen 2020; Wilmsen et al. 2019; Matanzima 2024b). The main reason is that policies barely translate into practice. Often, borrowers commit to abide by policy only to obtain funding from multilateral financial institutions (MFIs). As well, policies, safeguards and standards do not address some key issues experienced by affected communities, such as intangible cultural impacts, which cannot be compensated and are irreplaceable (Aronson and Price 2024; Downing and Garcia-Downing, 2009; Matanzima 2023; Matanzima and Loginova 2024).

The extractive sector, just like many other development sectors, induces displacement that results in impoverishment of communities. Mining activities had long displaced people in history, but it was only in 2002, that Theodore Downing wrote in detail about the impoverishment and poverty risks of resettlements induced by mining (Downing, 2022). Since then, mining induced displacement and resettlement (MIDR) literature has expanded and it has grown to be a field in its own right. MIDR is a phenomenon with adverse multidimensional effects ranging from economic, social, cultural, and political as detailed in Table 1. Empirically- rich case studies mainly from the Global South document negative experiences of Indigenous (and other land connected) peoples within the MIDR projects.

Also, Table 1 is a synopsis of what scholars have focused on within the MIDR field in the past decade or so. While table 1 provides a general overview of MIDR impacts, it is worth noting that the scale and severity of these impacts differ according to jurisdictions from which these studies were carried out. Most of this work has focused on displacements induced by non-critical minerals, for example, the gold and diamond rush in different regions of Zimbabwe (Brereton et al. 2024; Gukurume and Nhondo 2022; Manduna, 2023) occupied by different ethnicities and with varying social, economic and geographical characteristics shaping the varied outcomes reported. Critical mineral extraction has

Table 1
Summary table for literature focusing on the impacts MIDR (Source: The Author).

Impact Category	Main Focus	Sources
Socio-cultural	Disconnecting cultures from landscapes	Abya (2013), Aphun and Sharma (2017), Frantal (2016), Padel (2016), Okyeke et al. (2022), Mondri and Mistri (2022)
	Disruption of social networks	Camisani (2018), Chawatama and Oyelana (2019), Dastgir et al. (2018), Korah et al. (2019), Friedmen (2022) Angus (2017), Huckleberry (2022)
	Disrupted human-environment relations Mental health, trauma, stress and shocks	Birley (1995), Gloessing (2010), Gukurume and Tombindo (2021); Kruger et al. (2022)
Economic	Livelihood disruption	Camisani (2018), Chawatama and Oyelana (2019), Dastgir et al (2018), Mandishekwa and Mutenheri (2020); Manduna (2023); Mallik (2019), Mondal and Mistri (2021), Mtero (2017), Mukherjee (2017), Korah et al. (2019); Sharma and Singh (2019), Vesalon and Cretan (2013)
	Limited access to land/assets	Aguilari- Stoen (2016), Gukurume and Nhondo (2022), Gukurume and Tombindo (2021), Edelman et al. (2016), Manduna (2023); Mandishekwa and Mutenheri (2020); Sahoo (2022), Tang and Ho (2019)
	Disruption of Household income and consumption	Adam et al (2015), Dastgir et al. (2018); Mandishekwa and Mutenheri (2020); Manduna (2023)
Political	Encourage action of armed groups	Friedmen (2022), Geenen and Claessens (2013), Gukurume and Nhondo (2022)
	Disrupt leadership structures	Friedmen (2022)

similar impacts, but as stated below, we are interested in knowing how the “urgency” in their extraction could worsen these impacts; and how they can be understood and situated in the geopolitics of the planetary energy transitions. Beyond impacts, studies have also shown the resilience of these displaced communities including their engagement with governments and mining companies concerning the restoration and compensation of lost assets; as well as initiating new livelihood and survival strategies (Liu and Agusdinata, 2021; Gukurume and Tombindo, 2023). Also, different forms of (non)-violent protests are noted in the literature not just against MIDR but the mining activity itself and its known cumulative impacts (Muller 2019; Tjandara 2023). In Zimbabwe’s lithium case, resettled communities continue to engage civil society groups, such as the Zimbabwe Environmental Lawyers Association (ZELA), for legal assistance in demanding compensation for lost assets, including farming land, livestock, and water sources. However, these demands have not yet been met.

Some of these earlier studies categorized MIDR processes within the broader development induced displacement and resettlement (DIDR) framing (see for example, Behera and Padhi 2022; Yang et al., 2017; Terminiski, 2013; Vesalon and Cretan 2012), whereas other scholars have distinguished MIDR from DIDR arguing that displacements induced by mining can occur throughout the mining cycle (Kemp and Owen 2019; Owen and Kemp 2015, 2017). Owen and Kemp further argue that ‘the dominance of DIDR as a singular frame of reference limits the extent to which the particularities of MIDR can be understood and accounted for; consequently, this limitation has pronounced and detrimental effects on contemporary resettlement practice in the global mining industry’ (Owen and Kemp, 2017: 103). Five distinguishing factors of MIDR have been identified that includes: a) incremental expansion and uncertainty, b) cohabitation and proximity to production, c) interdependency, d) leveraging and cost increase, and e) governance by default (Owen and Kemp, 2017). It is essential to conduct more research on displacements induced by the energy transitions activities- including extraction of critical minerals and establishment of renewable energy infrastructure- to understand if whether trends follow similar distinguishing patterns or not. Largely because critical minerals extraction- induced displacements are a new turn in the MIDR field with their own particularities encapsulated in the “urgent” need to meet the net zero targets (Sturman et al., 2022; Owen et al. 2022). In the next section, the important particularities of the displacements induced by the “accelerated” extraction critical mineral are noted. These particularities may intensify or extend the already identified MIDR distinguishing factors. However, more case study- based research is required, both in the global north and south, to confirm this.

3. Critical minerals extraction

There is general consensus among scholars focusing on social and environmental impacts of critical minerals, in particular lithium, that in areas with high concentration of its deposits, displacements are inevitable (Babidge, 2021; Boafu et al. 2024; Matanzima and Loginova 2024; Owen, Kemp et al. 2023). These studies detail land grabbing processes that induce displacement and restricted access to land in different jurisdictions. Such trends of displacements have always been transpiring as a result of mining, but the “rush” to extract minerals to meet the net zero targets compound these displacements and their effects. Reports by the Human Rights Watch and Amnesty International in areas where Indigenous communities and peasants have been displaced by lithium extraction is indicative of serious impoverishment trends experience by resettled communities. Communities are left worse-off than they were before in the name of the low-carbon energy transition. This is largely because communities are not adequately compensated, if at all compensated. Although governments dictate the implementation of a compensation system for those displaced by mining activities, practical application faces considerable challenges (Boafu et al. 2024). The “speed” to extract minerals translates into poor resettlement schemes as

processes are fast tracked to acquire critical minerals required for the low-carbon transition.

Distinguishing displacement induced by critical minerals extraction from those resulting from the extraction of other non-minerals does not mean processes of relocation are atypical, but the “urgency” in acquiring the former may translate to the acceleration of critical and important social processes, such as consultation, consent and compensation, culminating into disastrous resettlement outcomes. Even for market dynamics, Owen et al (2022) point out that critical mineral extraction overrides the established markets norms. Market dynamics also determine the ways in which the extraction of minerals in the downstream regions plays out, in terms of social and environmental impacts (Owen et al. 2022; Sturman et al., 2022).

Forced displacements induced by the accelerated extraction of critical minerals are often talked about as unique in that: firstly, these minerals are on high demand and urgently needed to produce renewable energy technologies required for the planetary energy transition. Secondly, research predicts that the need to meet this demand may result in communities displaced from their lands without following due processes of consultation and consent, or through manipulation and coercion (Owen et al. 2022; Matanzima 2024). Thirdly, these displacements are a symptom of the scramble for critical raw materials among the US, UK, EU and China; and therefore, can be situated and understood through the geopolitics of critical minerals, more broadly. Fourth, displacements caused by critical mineral extraction are embroiled in critical issues of human rights abuses, violence and conflicts minerals characterizing regions in which these minerals are distributed. And the speed can compound or cascade the outcomes from these different forms of violence. Fifth, these displacements contribute to already existing inequalities at subnational, national and international level by impoverishing mining communities through social and environmental degradation. Sixth, similar to the conventional MIDR, the extraction of critical minerals may in the long run exposes communities to secondary displacements. Mine expansion, opening of new mines, mine waste, compounding environmental degradation, conflicts and violence may further displace (or restrict land access) for communities and artisanal miners.

3.1. Urgency

The urgent need to meet the net zero targets is projected to heighten the demand for critical minerals. For example, according to the International Energy Agency (IEA), in the next two decades, demand for nickel and cobalt will increase by 60-70%, copper and rare earths will increase by over 40%, and lithium by about 90% (IEA, 2024). Consistently, the World Bank estimates a 500% increase in mining activity within the same period to produce more than three billion tons of minerals required for wind, solar, geothermal power, as well as energy storage facilities.

Resultantly, a rush and scramble for their sourcing emerges (Deberdt et al., 2024; Hine et al., 2023). The scramble to source for critical minerals between USA, UK, and China exposes global south communities to displacement vulnerabilities. This scramble translates into the opening of new mines in different parts of the world generating severe environmental and social impacts. For example, estimates indicate that 384 new mines are required to meet battery demand by 2035 (Benchmark Source 2022).

The scramble for critical minerals is also associated with the fast tracking of the licensing of extraction by governments (Sturman et al., 2022), and consultation and consent processes by mining companies (Owen et al. 2022). Opening of new mines in marginalized regions inhabited by communities also induces different forms of displacements: i.e. physical, economic and cultural. Therefore, these isolated communities become embroiled in global politics and conflicts over critical minerals supply chains through dispossession and displacement. Communities within the developed countries engaged in politics of critical

minerals supply chains do not experience the resultant environmental and social impacts of such extractive processes as these are externalized to upstream communities. Such disparities in the distribution of benefits and impacts represents a “decarbonization divide” or “green colonialism” (Sovacool et al. 2020).

Furthermore, isolated communities from the global south also become entangled in the global political economies and ecologies of climate change mitigation. Studies have shown that a wide range of decarbonization activities, including accelerated critical mineral extraction, and the establishment of renewable energy technologies, are inherently detrimental and displacing (Kalantzakos 2020; McLellan et al. 2016; Tverijonaite et al. 2022). Even with the increasing calls for responsible sourcing of critical minerals, from such organizations as Organisation for Economic Co-operation and Development (OECD, 2016), environmental, and social impacts of extraction persist (Kramarz et al., 2021). For instance, studies from Democratic Republic of Congo (DRC) regarding two responsible sourcing initiatives (i.e. Better Mining and the Mutoshi Pilot Project) introduced in the 2010s, indicated the pros and cons of these initiatives, with the latter signalling the failure to effectively achieve responsible sourcing goals as stipulated in several international standards (Deberdt, 2022; Deberdt and Le Billon, 2022).

It is important to note that the urgency to extract critical minerals encounter with different sorts of measures put in place by global south governments to recover from the impacts of COVID- 19 on their economies. Continuously, governments regard mining as a catalyst for economic development despite the social and environmental impacts (Owen et al. 2022). But development for whom? As evidenced in this paper, communities displaced as a result of critical mineral extraction are impacted and not benefitting from the so-called economic development that lithium extraction is contributing to the nation.

3.2. Bypassing of consent/ lack of due diligence in resettlement processes

In their article “Fast Track to Failure” Owen et al (2022) asked critical questions about the future of consent within the energy transition agenda in which critical minerals are urgently needed. Critical minerals are widely distributed on lands upon which Indigenous people and peasants have legal or customary rights (Burton et al. 2024). These groups of people have “explicit consultation and consent rights” as stipulated in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas (UNDROP) (Owen et al. 2022; Burton et al. 2024). There are increasing concerns by Indigenous and non-Indigenous scholars about the risk of international safeguards and due diligence processes being diluted in the rush to meet the market demand for critical minerals (Owen et al. 2022; Sturman et al., 2022). Communities in the regions with high concentration of critical minerals are already characterised by gender inequalities, conflict, income inequality and food insecurity that interact to compromise their right to freely participate or consent to projects (Matanzima 2024b). Henceforth, manipulation and coercion can be easily applied in resettlements resulting from the exploration, extraction and production associated with the extraction of critical raw materials.

Another key challenge facilitating the bypassing or fast tracking of consultation and consent processes is new rules and laws put in place across the globe to facilitate the fast track of critical minerals extraction. The mining as a development strategy idea is a widely held public [and political] discourse in prominent mining economies. These economies are “simplifying” and “relaxing” regulatory requirements to “push” and “unlock” mining’s potential through “fast-tracking” and “streamlining” project approval and mine permitting processes (Owen et al. 2022). Several jurisdictions, in the global south and north, such as Peru, Brazil and Australia have worked to attract mining investment through incentives and eased regulations. Specifically, in early 2021, Brazil introduced a policy to streamline the approval process for new mining projects considered to be strategic to national economic recovery. The

policy does not guarantee that projects receive permits, but rather, seeks to move major projects through the process without delay. In March of 2021, mining giant Vale was amongst the first to qualify under the policy for iron ore and copper projects in northern Brazil (Ministry of Mines and Energy 2021). Such policy initiatives expose Brazilian Indigenous communities (located near critical minerals) to mining and its impacts (Rorato et al. 2022; Versteegen and Rorato 2023).

3.3. Increased human rights abuses

Displacements caused by extraction of critical minerals need not to be understood in isolation from the human rights abuses and protracted conflicts occurring in mining regions. While displacement itself is a violation of human rights to shelter, water and land- those displaced may face multiple human rights abuses associated with critical minerals e.g child labour, sexual assault against women, violence and conflicts as well as safety and health risks (Kramarz et al., 2021; Zhou and Brown, 20024). Displacement disempowers communities rendering them precarious and vulnerable to these cumulative human rights abuses. Thus, human rights violations in mining regions adds to the intricacies of displacements.

On the African continent, critical minerals such as lithium and cobalt are located in conflict- affected and high-risk areas (CAHRS). Critical mineral extraction is embroiled in different layers of conflicts in these regions. From conflicts between large scale mining companies and artisanal miners to quarrels between law enforcers/ security and artisanal miners to disputes among artisanal miners and immigrants. Communities in these regions are exposed to such conflict dynamics that underdevelop their regions, exacerbate human rights abuses, and expose them to serious safety and health risks.

While forced displacements may result from exploration, construction and production in mines, there are also other forms of displacement that are bound to occur, for example, women and children fleeing from abuse, violence and conflict associated with the extraction of critical minerals. A recent report by the International Displacement Centre (IDC) indicates that these displacements sharply increased in 2023 in mining regions. Other secondary displacements result from communities fleeing biodiversity and environmental impacts of mining projects. A recent study showed that mining for renewable energy metals and minerals has led to new forms of extraction, processing, application, and disposal that contaminate ecosystems, adversely affecting biodiversity, habitats, functioning ecosystems, with subsequent impacts on air and water quality, and human health (Kramarz et al., 2021).

3.4. Impoverishment and inequalities

Low-carbon transitions are often assumed as positive phenomena, because they supposedly reduce carbon emissions, yet without vigilance, there is evidence that they can in fact create new injustices and vulnerabilities (Sovacool, Martiskainen, Hook et al. 2019; Sovacool et al. 2020). New injustices and precarities relate to complexities of distributive, procedural, cosmopolitan and recognition aspects (Heffron, 2020; Sovacool, Martiskainen, Hook et al. 2019). The overarching explanation of these four aspects is the spatial and temporal precarities of vulnerable groups induced by the unequal distribution of wealth, benefits and impacts of projects. These are severe in communities upstream where critical minerals are extracted; and they are often reflected in socio-cultural impacts, land grabs, and displacements. Forced displacements throughout history have resulted in the protracted impoverishment of resettled populations. Critical mineral extraction attracts revenue to the global south economies, but sadly communities who bear the brunt of the extractives are excluded from benefitting by political elites. As well, consumers of critical minerals and end users of the clean technologies produced from them incur less environmental or social costs, compared to communities in mineral rich regions whose rights are violated through land grabbing and forced displacements. As stipulated in the

entrenchment process of the political ecology of climate change mitigation framework, decarbonization related projects create disparities within and across jurisdictions leaving vulnerable groups exposed to serious risks (Sovacool, 2021). As recently argued, entrenchment's attributes culminate into a new resource curse (Boafo et al 2024; Kramarz et al., 2021).

3.5. Increased risk of secondary displacements

Furthermore, the speed at which critical minerals are needed for the low-carbon transition will translate to the exploration and opening up of new mines or extending the existing ones culminating into secondary displacements- a situation whereby communities will be displaced several times in different ways either physically, culturally and economically (Matanzima 2022; Matanzima and Loginova 2024; Wilmsen et al. 2021). Opening new mines comes at a cost. For critical minerals, there are several costs to be met including those relating to locating virgin ore bodies and need for heavy investments for active exploration budgets, extraction and beneficiation (The Assay 2023). Environmentally, intensification of mining activities results in serious land disturbances and mine waste volumes (Lèbre et al. 2020; Valenta et al., 2023) that can extend beyond the mining areas creating conditions for human displacement (Owen et al., 2024). A recent detailed analysis of the "boundary types revealed clear intersections between the spatial extent of mine waste and areas used for human settlement [and livelihoods]" (Owen et al., 2024). Other costs relate to conducting Environmental and Social Impact Assessments (ESIAs) as well as processes of consultation and consent with impacted communities throughout the mining cycle. Within the critical minerals industry, there is a high probability of risks and costs being externalized to communities placing more pressure on already vulnerable regions [and sensitive ecosystems] as it has always been the norm within the mining industry, more generally (Brereton et al. 2024; Franks et al. 2010; 2013).

4. Approach

This article is based on qualitative data gathered through extensive literature review, document analysis, watching documentaries and semi-structured interviews. This is largely because the paper refers to different cases within Zimbabwe where lithium has been discovered resulting in differing forms displacement of communities. Information about these cases is reported in different sources, calling for a holistic approach in data sourcing.

The study draws on literature from different fields including displacement and critical minerals searched on Google Scholar, Scopus, and Web of Science. To obtain papers on displacement; the following terms (and their acronyms) were entered in search engines "development induced displacement and resettlement", "DIDR", "mining induced displacement and resettlement", "MIDR". Literature on the social and environmental impacts of critical mineral extraction was searched using such terms as "green minerals", "energy transition minerals", "critical minerals", "critical energy transition minerals" and "strategic minerals". To obtain works from the global south, the aforementioned strings of words were entered in combination with such terms as "global south", "Africa", "Asia", "Latin America", and "least developed countries". These broad terms were also combined within search engines using connectors "AND" or "OR" to generate relevant material to the study. The search was narrowed to the literature published from 2015, when the renewable energy and decarbonization agenda gained much momentum.

Information on the critical minerals (mainly lithium) extraction in Zimbabwe was obtained through analysis of grey literature and media reports on the events happening on the ground. This is largely because there is limited academic literature on this topic. Grey documents in the form of reports by such human rights and civil society organizations as Zimbabwe Environmental Lawyers Association (ZELA), Amnesty

International, Africa Institute for Environmental Law, and Centre for Natural Resources Governance (CNRG) were consulted. These documents were sourced directly from the representatives of these organizations that were interviewed by the researcher. Media reports were searched online. Relevant articles were filtered using the following terms “Zimbabwe”, “critical minerals”, “lithium”, “displacements”, “resettlement”, “human rights”, “relocation”, “communities”, “peasants”, “livelihoods”, “Chinese mining companies”, and “Zimbabwe government”. These strings of words were combined by connectors “AND” and “OR” to generated relevant papers. Media reports obtained were from 2020 to 2024, when the politics and debates surrounding lithium extraction and displacement in Zimbabwe gained much attention of the media.

The research also benefitted from the publicly available Youtube documentaries on the politics and impacts of lithium extraction in Zimbabwe as well as those that were specific to displacement. These documentaries are from the investigative research and journalism conducted by the CNBC news, Aljazeera The NewsHawks, the Information Development Trust and the Centre for Natural Resource Governance of Zimbabwe (CNRGZ). The documentaries are recent and provide detailed information about the weak governance, corruption, human rights abuses, natural- resource looting, biodiversity loss and forced displacements in Zimbabwe. The first one by CNBC News is 16:28 minutes long and provide a general overview of the rush for lithium in Zimbabwe by the Chinese and was posted on 9 March 2023. It includes national experts on mining impacts in Zimbabwe commenting on the Zimbabwe’s lithium case. The Aljazeera documentary entitled “Gold Mafia” focuses on natural-resource looting in Zimbabwe by politicians and prophets. It is 51:32 minutes long and was shared in March 2023. The IDT documentary is 17:43 minutes long and was posted on YouTube on 6 September 2023. It focuses on the forced displacement induced by the lithium extraction in Bikita at the Chinese-owned mine Sabi Star. The NewsHawks one is 11: 29 minutes. It was posted on 20 March 2024. It is also about lithium induced displacements at Bikita’s Sabi Star mine. The CNRGZ focuses on the social and environmental impacts of lithium extraction. It is 19:50 minutes long and was posted in May 2023. The narrator, Dr Maguwu, also provide a snapshot of the displacement problem in lithium concentrated regions in the country. Documentaries were available in Shona and English languages. Shona is the first language of the researcher which made it easy to understand and make use of the content. The researcher also understands English.

Data from literature, media and documentaries was complemented with detailed qualitative interviews. Qualitative interviews were carried out with members from civil society organizations working with communities impacted by mining activities to protect their rights and advance their needs. These included 2 officials from Zimbabwe Environmental Lawyers Association (ZELA), 1 official from African Institute for Environmental Law (AIEL) and two officials (including the Director) from the Centre for Natural Resource Governance (CNRG) as well as members of the media who have been covering stories on the displacement of communities due to lithium extraction in Zimbabwe, such as The NewsHawks.

To make sense of the qualitative data obtained, the study uses the political ecology of climate change adaptation theoretical framework developed by Sovacool (2018) and Sovacool (2021). Findings are categorized under the four themes of the political ecology of climate change mitigation framework. This further justifies the use of the framework and its applicability in analysing resettlements caused by the “urgent” need to extract critical minerals for the low- carbon energy transition in different parts of the world. Literature on the political ecology of climate change mitigation and of works that have applied it in natural disasters, and renewable energy was obtained online using the keywords of the framework. Clearly, the framework has not been applied to the politics surrounding critical minerals extraction issues, let alone displacement. What follows in the next section is an application of the theory to the forced displacements occurring in Zimbabwe.

5. The political ecology of climate adaptation framework and Lithium mining induced displacement in Zimbabwe

The political ecology of climate change mitigation framework draws from political ecology or political economy ideologies to discuss power relations or vulnerabilities in climate change mitigation or energy transitions (Sovacool, 2021). Critical minerals are central in providing the resources required for the low-carbon emission technologies, hence the framework is applicable in understanding the injustices and power dynamics associated with their extraction. Processes of sustainable development or climate change mitigation (such as critical minerals extraction and the establishment of renewable energy technologies) are complicit in condoning ecological degradation, perpetuating social vulnerabilities, and violent conflicts. These negatives effects induce the displacement of communities. This framework is unique because it envisions four different processes that shapes social climate responses across the economic, political, ecological, and social dimensions (see Table 2) (Sovacool, 2021). As an additional novelty, so far, the framework has been applied to climate change adaptation, disasters recovery, climate change mitigation (Sovacool et al, 2018) but with limited application to the critical minerals’ extraction field. Thus, this article makes a significant contribution to literature that applies the framework to make sense of different processes and politics of the low-carbon energy transitions.

This section details the Zimbabwe lithium extraction- induced displacement case leaning on the political ecology of climate change adaptation framework. The political ecological of climate change adaptation concept has four components that help us understand the social and economic injustices associated with climate action. These are enclosure, exclusion, encroachment and entrenchment, see Table 1. The lithium’s value chain in Zimbabwe and its associated forced displacement and resettlements are best explained through these four processes. Each of the framework’s four processes characterizes the lithium industry in Zimbabwe from licensing, exploration, construction and extraction. Throughout these processes communities are displaced in various ways. Thus, data from the field is categorized under the four processes of the political ecology for climate change mitigation framework.

5.1. Enclosure

The enclosure process entails the transfer of a “public or social [or communal] asset into private hands, or expands the role and authority of a private actor into a formerly public sphere” (Sovacool et al. 2018: 245). Enclosure is characterized by elite capture and different forms of land grabbing (Sovacool 2018; 2021). Interpreted through Marxist lens, this process marks the stage when capitalists acquire control or seize land and economically appropriate it, in this case, for exploration and extractive activities. Enclosure can occur with physical resources such as

Table 2
Summary of the processes and sub-processes of enclosure, exclusion, encroachment, and entrenchment (Sources: Sovacool et al. 2018; Sovacool 2018).

Dimension	Process	Description	Sub-processes
Economic	Enclosure	Capturing resources or authority	Territorial accumulation, privatization, market stretching, parallel bureaucratization, land grabbing
Political	Exclusion	Marginalizing stakeholders	Dispossession, accumulation by dispossession, tyranny
Ecological	Encroachment	Damaging the environment	Commodification, subordination, forum shopping
Social	Entrenchment	Worsening social inequality	Comparative advantage, elite capture

money or land, or it can relate to immaterial resources such as power and sovereignty (Sovacool et al 2018).

When private actors acquire legitimate control over remote lands, they want to make productive of the land. With regards to mining companies this would entail exploration and extraction of critical mineral resources. Processes of territorial accumulation may entail the displacement of communities. Research has shown that more 50% of critical mineral deposits are located on Indigenous people and peasants' lands (Owen et al. 2023), and in these regions, displacements have occurred or are impending as the regions continue to attract extractive companies. In most of Africa, including Zimbabwe, current land tenure situation exposes local communities to displacement vulnerabilities. Local communities often have 'usufruct rights' to the land and therefore can be easily displaced because much of the communal land is classified as state land hence inhabitants tend to be displaced whenever resources considered key for the country's development are discovered. Even when it comes to compensation, such forms of land tenure complicate claims, claimants and proportions to compensation (Kikido et al. 2015). This fluidity often results in the inadequate, unjust and untimely compensation of impacted communities (Manduna, 2023).

The enclosure process underpins a discussion of the proliferation of lithium mining companies in the remotest parts of Zimbabwe where peasants, and poor and marginalized ethnicities reside. These vulnerable communities are increasingly exposed to capitalism due to the discovery of lithium in their regions. In Africa, Zimbabwe is considered the largest producer of lithium (Mtondoro, 2024). Since 2021, investors have collectively invested over US\$1 billion in acquiring and developing lithium mines throughout Zimbabwe. Statistics indicate that Zimbabwe is the 6th largest lithium producer worldwide and potentially contributes 20% to the global demand for lithium. In 2024, its mine production was at 3, 400 metric tonnes (Mtondoro, 2024).

Since 2023, Zimbabwe witnessed a surge in companies seeking to invest in lithium mining. According to the Zimbabwe Investment Development Agency (ZIDA), out of the 116 investment licenses issued to foreign investors in the first three months of 2023, 42 were granted to companies seeking to invest in the lithium industry (see Mberi, 2023). The government is promoting such investment constantly mentioning that "Zimbabwe is open for business". Due to increased investment in lithium related projects, the country' mining revenue spiralled from US\$ 2.7 billion in 2018 to US\$ 5.3 billion in 2021 (Moyo, 2023).

The ways in which lithium mining companies enclosed the communities was not properly planned in terms of ensuring that affected communities and other Zimbabweans benefit from lithium projects. The country's lithium projects are equated to colonial forms of extraction that lacked due diligence and severely impacted on communities and environments. As Dr Maguwu, Director for Centre for Natural Resource Governance in Zimbabwe, stated:

The lithium projects in the country were a great opportunity because it's a resource that is sought after in the world right now. Unfortunately, the moment that we realized we had lithium the only thing that came to our minds was to extract and export. There was no masterplan to say okay Zimbabwe we have these vast deposits of lithium. Lithium is being demanded the world over by the high-tech industries, vehicle manufacturing industries. What shall we do? How are we going to create linkages and improve the value of the lithium and have strategic partnership with countries that have high demand of use of lithium. We only extracted and exported. There was no national engagement and development of a plan of how to make the most out of that lithium. China has a better plan with our lithium than Zimbabwe itself and that is a tragedy.

As shown in Table 3, the Chinese have a larger stake within these lithium mining companies. These companies, with the support of the government, are encroaching on the remotest parts of the country where lithium resources are located causing serious human rights abuses, forced displacements and some of these projects are associated with safety and health concerns. As reported by Curators (2024), Zimbabwe's

Table 3
Lithium Projects in Zimbabwe (Sources Bore 2023; Mtondoro, 2024).

Name of Company	Stages in the mineral value	Shareholder Structure and beneficial owner and Country Origins	Off takers/ final consignee
Prospect Resource Goromonzi	Mining and Processing	Zhejiang Huayou Cobalt Ltd (87%), Prof Kingstone Kajese (6%), Tamari Trust (7%) Country of Origins for Investors: Australia and China	TESLA Inc ⁱ , Build Your Dream Co Ltd ⁱⁱ , LG Group ⁱⁱⁱ
Bikita Mining Company Masvingo	Mining, processing, and exporting	Sinomine Resources Group (100%) Country of Origins for Investors: China	LG – South Korean Electronics Company BYD, CATL
Kuvimba Mining House Mberengwa-Sandawana	Mining	GoZ (65%) and 35% is owned by private investors. Country of Origins for Investors: Zimbabwe	Not known
Max Mind Private Ltd- Sabi Star Buhera,	Mining, and completing setting of processing plant	Shenzhen Chengxin Lithium Group Company Limited holds 51% in Max Mind. Build Your Dream, an EV producer, holds a 5% stake in Shenzhen Chengxin.	Contemporary Amperex Technology Co Ltd (CATL) ^{iv} , Build Your Dream Co Ltd
Premier African Minerals Resources Limited Fort Rixon-Zulu Mine Insiza Mutare Greenstone Belt	Mining and Processing Exploration	Premier African Resources holds a 49% stake, while the GoZ ^v holds the remaining 51%. Country of Origins for Investors: UK and Zimbabwe	Canmax Technologies ^{vi} ,
Kamativi Mining Company	Mining	Sichuan Yahua Lithium Industry Technology Company Limited has 60% stake. Zimbabwe Mining Development Corporation is a shareholder. KMC is a joint venture between the two Country of Origin: China	TESLA Inc, LG Group, Panasonic Holdings, BMW Group, Volkswagen Group, NIO Inc, GAC Motors, Zhenhua New Materials ^{vii} , Xiamen Tungsten New Energy, ^{viii} Dangsheng and Rongbai Technology ^{ix} al manufacturing company
Gwanda Lithium Project Gwanda	Mining & Processing	Unknown	Not yet mining

ⁱ TESLA is an American EV producer and technology company
ⁱⁱ Chinese automotive and EV producer.
ⁱⁱⁱ South Korean electronics chemical and telecoms company
^{iv} CATL is a Chinese battery manufacturer and technology company
^v GoZ through the through the National Indigenisation and Economic Empowerment Fund holds 51% in the Premier African Resources
^{vi} Canmax Technologies is a Chinese company specializing in technology and resource development
^{vii} Zhenhua New Materials is a company engaged in the research and development (R&D), production and sales of battery cathode materials.
^{viii} Chinese company which manufactures cathode materials for lithium-ion batteries
^{ix} Rongbai Technology is a high-tech new energy material manufacturing company

rush for lithium, led by Chinese investors, is overlooking crucial environmental and social standards, and this leads to impacted regions experiencing the injustice of the energy transitions as described within the political ecologies of climate change mitigation theoretical framework.

The Zimbabwe African National Union – Patriotic Front (ZANU PF) government is supportive of lithium extraction and considers it as an opportunity for economic development. Regions with lithium have recently attracted visits by senior government officials including the president officially opening these remotest parts of the country to mineral exploration and extraction in disregard of the social and environmental issues that they expose communities to.

Multinational mining companies capitalize on Zimbabwe weak governance and corruption to obtain [social and economic] licenses to operate. Local communities are not consulted prior to these companies encroaching on their lands and waters. In my interviews with ZELA and CNRG officials it was noted that the government is not putting in place measures to promote the involvement of communities in decision-making or empowering communities through creation of partnerships with mining companies as is happening elsewhere in the world where Indigenous communities are becoming part of energy transition projects through various important means of agreement-making and benefit-sharing (Kung et al., 2022).

5.2. Exclusion

Exclusion often occurs in tandem with or after enclosure. It refers to the exclusion or displacement of communities or limiting their access to natural resources. The process of exclusion enables resources to be appropriated or consolidated by state authorities, private firms, or social elites (Sovacool 2018; Sovacool et al. 2018, 2020). It is characterized by accumulation by dispossession and tyrannical practices in which state authorities and private firms dictates environmental uses in disregard of local communities, even when it means physically displacing communities and restricting their access to natural resources that they depend on for livelihood. Due to tyrannical tendencies of exclusion processes, communities' rights to land, shelter, and water are overlooked; and they are less likely to be consulted or involved in decision-making processes regarding mining projects and its impacts. Prior research on mining induced displacement confirms that in most cases communities have been displaced with little consideration of processes of consultation and consent (Mathiba 2023; Owen and Kemp, 2017; Yang et al. 2017). Often, consent has been bypassed because it is a lengthy process that can be costly (Sturman et al., 2022), and sometimes it is avoided because it entails the interference of impacted communities with capitalists' interests (Sovacool et al 2018); which is a clear denial of affected people's right to say "No" to socially irresponsible projects.

Understood through the processes of exclusion, lithium extraction in Zimbabwe has resulted in land grabbing from peasant communities and unjust land use changes. Land grabs have induced different forms of displacement from physical to economic to cultural. As well, land use changes have restricted peasants access to natural resources that sustain their livelihoods. It emerged from the interviews with members of the civil society groups and different media reports that in different parts of Zimbabwe were lithium is extracted (or were its mines are expanding), communities have to bear the brunt of displacement "without meaningful compensation". Such a trend of poor compensation characterizes prior MIDR processes in Zimbabwe.

In terms of physical displacements, one ZELA officials mentioned the relocation of 41 Mukwasi villagers of Buhera because of the lithium extraction activities by Max Mind (a Chinese owned mining firm). In this case, people were removed from their agricultural and ancestral lands. In the same case, people were culturally "displaced" and impacted as graves of their relatives were exhumed and had to be reburied in other places. As a CNRG official stated:

These people were rural dwellers, who attach so much to graves and were not accustomed to the practices of exhumation. So, for many elders it was a traumatic experience. The exhumation reopened old wounds (Interviewed on 10/ 05/ 2024).

In one documentary, by the NewsHawks, one old villager was crying as she narrated the process of exhumation that transpired; and how traumatic it was for her to rebury their immediate family members.

Similarly, in Insiza, the setting up of the Premier African Minerals owned Zulu lithium mine displaced 26 families. These families lost agricultural land as well (Moyo, 2023). Thus, within the same case we see both physical and economic displacements. The occurrence of forms of different of forced displacement in one case entails that compensation or any remediation schemes should pay attention to all these varied forms of displacement to ensure that all impacts are addressed. One of the compensations packages provided to displaced families was the establishment of a paprika irrigation scheme. The company offered to "teach villagers how to grow and manage the crop and once ripe, the mining company would purchase it, and proceeds will be shared by villagers" (Moyo, 2023). The mining company also constructed a dam which was used by both the company and affected villagers.

While the government and the mining companies justify displacement through the compensation rhetoric, civil society groups interviewed indicated that what communities receive as reparations for losses incurred is inadequate. These forms of compensation are remedial and do not necessarily empower communities in the long term. This is argued in light of development and improvements happening in some parts of the world, such as Canada and Australia, where Indigenous communities impacted by mining are involved within these projects as partners through different forms of agreements (Hoicka et al. 2023; Savic and Hoicka 2023). There must be equitable land access in which affected people are economically empowered through their inclusion in ownership of the projects.

5.3. Encroachment

Encroachment entails environmental degradation that results from projects. The degradation of environment also involves private firms interfering with sensitive ecosystems and intrude upon biodiversity conservation zones such as protected areas and national parks (Sovacool et al. 2020). Environmental degradation in the critical minerals case, can occur throughout the mining cycle and can have a bearing on the social and economic life of impacted communities. Environmental impacts of mining, mainly those relating to mine waste, results in changes in land cover and uses creating conditions for cultural and economic displacements in remote and vulnerable regions in which these projects are taking shape (Owen et al., 2024). Specifically, contamination of lands and waters, due to mine waste emissions, disturbs people's lives, livelihoods and cultural practices (Matanzima and Loginova 2024; Sovacool et al. 2020).

Furthermore, the environmental impacts may also include carbon emissions that not only contribute to global warming, but impacts the health of local communities. In this case, while mining provides resources required for the low-carbon transition, the processes it involves may contribute to intense emissions compromising the decarbonization goal and the achievement of "just transitions" for many jurisdictions (Bainton, Kemp et al. 2021). The mining industry is considered as an "intensive energy user and greenhouse gas emitter" (Lèbre et al., 2020: 4).

Though in its nascent stages, the "rush" to extract lithium in Zimbabwe, has already started to show many environmental risks, that can be protracted as demand for energy transition minerals heightens. For example, the expansion of the Bikita lithium project is causing serious environmental damage in the area. Local communities are complaining about these challenges, but the government of Zimbabwe is reported not to effectively enforce environmental laws. Environmental

law enforcement is compromised in the country as the government considers lithium extraction an economic development opportunity.

Environmental degradation is exposing communities to uncompensated economic and cultural displacements in which their fields are turned into roads and powerlines for the mining companies. This impacts on people's sources of livelihood. These people are marginalized and survive under serious conditions of hunger and poverty. The impacted villagers are complaining about such impacts. One impacted villager impacted by the Bikita mine complained:

They opened roads and cleared space for a road and power lines through our maize fields. They never consulted us over the issue, and we were surprised to see bulldozers clearing our fields, and sometimes passing near our homes (quoted in Chitadu, 2024).

Consistently, in a recent documentary released by the CNRG, it was noted that:

the Sinomine of Bikita minerals had a fraudulent environmental impact assessment process where Murape Community, which is the most affected by lithium mining was not consulted. They went to consult a community or a village, which is yonder, and which is not going to be affected by lithium. And that is fraud.

The complaint in the above quote indicates the exclusion of affected communities in critical minerals projects, even though they are negatively impacted. Such exclusion means affected communities cannot be included in these projects as decision makers, beneficiaries and negotiators of fair outcomes. Such problems of lack of due diligence in ESIA's characterize the sourcing of critical minerals throughout the globe, resulting in impacted people protesting and petitioning the reversal of such projects. For example, in Northern Finland and Northern Portugal, Indigenous people and cattle herders have protested against lithium exploration projects that bypassed ESIA's- leading to postponement and cancellation of some of these projects by big mining companies (Eerola 2024).

In the Bikita case, one affected villager, from Bikita minerals area, complained that the ESIA was not done:

This mine has operated since 1950s. it was operated by one company to another like British, Germans etc. So they [Sinomine] say why can we do another EIA? They say, why do we require it for a mine that was already operating? So we do not really know a lot about environmental law, and all they say to us is EIA was already done. They say the EIA process is only done at inception [of the project] when companies want to mine for the first time in an area. So, on those procedures they don't consult us.

In the area, water sources are contaminated by mine waste and the company is greenwashing these impacts. For example, in the CNRG documentary, affected villagers accuse the Sinomine of polluting the Matezva Dam with unknown toxic chemicals. Contamination of the dam is impacting communities' uses of the dam including for domestic purposes and fishing. As one woman complained: "We survive on selling farming produce watered from the dam, as well as fishing and doing our laundry. However, the mine polluted the dam, and our crops were affected. It also led to death of fish and aquatic life,". She also said that: "Some of the villagers' cattle who drink from the dam were also affected." When natural resources are contaminated communities are exposed to health risks. Communities can also stop accessing these natural resources for livelihood, which can severely impact on their daily lives.

Furthermore, the Zimbabwe's Environmental Management Agency (EMA) reported that the spillage contained potentially toxic chemicals that were dumped into the dam. However, it refused to disclose the type of chemicals from its test results. This is a danger to communities as they depend on a contaminated water resource and are unaware of the level of risk they are exposed to because of inadequate information. EMA also confirmed that it had fined Sinomine \$5,000, which is level 14, the highest penalty for polluters, and gave the mine one month to address

contamination issues (Moyo, 2023).

5.4. Entrenchment

Entrenchment refers to the disempowering of vulnerable groups such as women, minorities and children during the project's life cycle. It is a process whereby natural resource extraction projects "entrench inequality by interfering with egalitarian systems of distribution or procedural justice, or by further concentrating wealth within a community or transferring risk" (Sovacool et al. 2018: 246). Studies have shown that mining companies externalize the costs of their operations onto local communities in different ways (Keenan et al. 2019; Kemp, et al. 2011); and displacement is one such way. As noted earlier in prior studies (see table 1), displacements resulting from the extraction of critical minerals socio-economically and culturally disempower people.

Communities impacted by accelerated extraction of critical minerals are mostly Indigenous people and peasants whose vulnerability is reflected in marginalization, lack of information, limited education and lack of legal representation (Owen, Kemp et al. 2023). Therefore, forced relocation of such communities perpetuates their vulnerability and significantly contribute to their sociocultural impoverishment. While compensation schemes are set up to help alleviate poverty resulting from displacement, intangible cultural heritage of communities cannot be compensated, and neither can it be replaced (Matanzima 2023; Aronson and Price 2024). Thus, displacement can also have a permanent impact on the sociocultural activities of Indigenous and peasant communities.

Entrenchment also occurred as a result of the establishment of the lithium mining in Buhera, south-eastern Zimbabwe. While the Max Mind mining company won land and the revenue to be accrued from lithium production, communities were left impoverished in every sense of the word. The most severe impacts were on women and children from the Mukwasi Village in Buhera. With regards to children's experiences, resettled families complained that the new resettlement areas were far removed from schools (see the documentary: IDT, 2023). Hence, their children were traversing longer distances to reach the nearest schools. In their previous homes, schools were closer, they narrated. Parents were worried that their children would poorly perform in school as they arrive late and tired from walking longer distances. Women were also concerned that the houses provided as compensation were registered under their husband's names- a move they described as disempowering because in their former places customary tenure provided them with a form of security. Furthermore, very few jobs were created for impacted families in these areas. A few men from impacted communities benefitted than women. Women remain with limited livelihood opportunities as they are displaced due to the extraction of lithium. This is a trend that has been reported in Buhera, but also consistent with the vulnerability of women reported in other mines in the country including Mazowe (Shaba and Swart 2024). As Parmenter et al. (2024) reported the mining industry is male dominated and often excludes non-Indigenous or local communities. Generally, in mining regions, women continue to occupy marginal positions, and hence depend on their male counterparts for survival.

However, even impacted men, in the Buhera displacement case, complained that jobs created were very few and not all of them were employed at the mine. As of September 2023, IDT reported that only a few men had obtained jobs, and the majority of the employees were coming from other districts (IDT, 2023). Also, there were complaints that managers within the mining companies were "selling jobs", "one must bribe the management to get a job within the mine" (The News-Hawks, 2024). As reported elsewhere Indigenous and peasant people often lack the required formal education, and their standards of living are generally low (Burton et al. 2023) to compete for opportunities. They mainly depend on land-based livelihoods, and resettlement results in loss of land. Thus, they are less competitive when it comes to applying for more technical jobs within the mining sector, living them exposed to

menial jobs, if they are at all employed by the company. As argued by [Downing \(2022\)](#) involuntary resettlement creates new poverty for impacted communities.

In Bikita district, lithium mining extraction is inducing severe social and environmental impacts, as well. In the CNRG documentary, communities raise serious concerns about the environmental impacts lithium mining that are socio-economically displacing. The most environmental challenges are water pollution and land degradation that are resulting in communities having fewer sources of water and land for farming [and cultural activities] (Interview with a CNRG official 14 April 2024).

6. Discussion and Conclusions

The low- carbon energy transition induces an urgent need to source for critical minerals from mineral rich regions in the world. Most of these regions are in the developing world and have high levels of governance risks. Within these jurisdictions, weak governance scores compound ESG risks of critical minerals extraction ([Lèbre et al., 2020](#); [Matanzima 2024](#)). Consequently, vulnerable communities and sensitive ecosystems will experience most of these impacts, intensifying social and ecological injustices ([Zhou and Brown, 20024](#); [Lebre, Stringer et al. 2020](#); [Bainton, Kemp et al. 2021](#)). As the demand for critical minerals increases, so will their extraction and associated socio-environmental risks. Different forms of human displacements (i.e cultural, economic and physical relocations) will result from critical minerals extraction worsening the plight of already marginalized, precarious and impoverished communities ([Matanzima 2024](#); [Owen et al., 2024](#)).

Using the political ecology of climate change mitigation framework, this study examined physical, economic and cultural forms of displacement that result from the decarbonization praxes, particularly the extraction of lithium in Zimbabwe. Different cases from Zimbabwe are referred to. The overall observation is that in all these cases either one or two, or all forms of displacement have occurred resulting in the impoverishment of people socio-economically. The political ecology of climate change mitigation framework has four components that illustrate how communities are impacted by different activities aimed at mitigating climate change, including critical minerals extraction. Therefore, this paper showed how these four components of enclosure, exclusion, encroachment and entrenchment (as summarized in [Table 2](#)) prevail in the Zimbabwe's lithium mining industry. These four components are a useful template for understanding different sets of social and environmental impacts and risks associated with different periods or stages of mining including exploration, licensing, construction, extraction and production. In mining, displacements are bound to occur several times due to the nature and complexity of the activities ([Owen and Kemp, 2017](#)).

These displacements are leaving communities worse off and disempowered because they reshape local actors, cultures, livelihoods and landscapes ([Escosteguy et al. 2024](#); [Kingsbury and Wilkinson 2023](#)). As [Kramarz et al](#) notes these different forms of displacements are "mutually-reinforcing processes that reduce people's capabilities to live and work in a particular place" ([Kramarz et al., 2021](#): 73). Theorizing these forms of displacement through the "urgency" to decarbonize provides an entry point for comprehending how that acceleration results in resettlement failure. Resettlement failure entails the widespread and severity of negative social, political, cultural and economic outcomes of relocation when affected communities are left worse off than they were before ([Owen and Kemp 2016](#); [Partridge and Halmo 2020](#); [Scudder, 2019](#); [Matanzima 2022](#); [Matanzima and Nyachega 2024](#)). Furthermore, resettlement failure often occurs when key processes of resettlement-including the participation of impacted communities in decision making or processes of consultation and consent- are bypassed or fast tracked, as illustrated in different cases above. As well, the absence of meaningful agreements and benefit sharing options, "unfairer" compensation and the poorer choice of new resettlement sites as reflected in their

incompatibility to the lives and livelihoods of resettled communities also contribute to the unsuccessfulness of resettlement programmes ([Smyth and Vanclay, 2017](#); [Wilmsen 2011](#); [Wilmsen et al. 2021](#)).

As noted above, Zimbabwe lacks a lithium extraction strategy that can guide investment prospects, extraction and exportation of the resource. As such, the lithium industry is fraught with serious social and environmental risks that are externalized to communities. Other jurisdictions, such as Australia, Canada and the US, have taken a lead in drafting critical mineral strategies that Zimbabwe could draw lessons from. As well, Zimbabwe has no resettlement policy, and recent studies have been pushing for the need to introduce a resettlement framework that would guide the relocation of communities either by development or mining projects to ensure that affected people are left better- off after resettlements ([Manduna, 2023](#)). The [Mines and Mining Act of Zimbabwe \(2013\)](#) is the one used to guide resettlement practices, but it is flawed. For example, while it encourages mining companies to compensate displaced victims, it does not state how. Mining regulation in Zimbabwe remains problematic and this is perpetuated by weak governance, corruption and underdevelopment in the country. The presence of lithium in Zimbabwe is a resemblance of another resource curse. While the resource can be used to promote local development through offering affected people jobs, training, infrastructure developments and cash compensation, currently, this is not the case. A few are benefiting from the extraction of the resource.

Currently, compensation packages in Zimbabwe are deemed unfair. In the Buhera case, for example, communities were manipulated into signing an unfair agreement, and today they narrate stories of having been short changed. There is need to promote fair agreements that empower communities through equity and partnerships. Communities should have a stake within the mining production itself as what is happening elsewhere across the globe. For example, in Australia and Canada, some Indigenous peoples impacted by natural resources extraction are provided a stake within the industry through different processes of agreement making and benefit sharing that promote equity and partnerships ([Kung et al., 2022](#)).

Governments typically consider natural resource extraction as a strategy for promoting economic development. Such is the case in different regions where large swathes of lithium deposits are concentrated ([Bore 2023](#); [Chaves et al. 2021](#); [Mejia-Munoz and Babidge 2023](#)). However, scholars are questioning the so called "development" paradigm of lithium extraction arguing that the development is "uneven"; and also questioning who the development is meant for? Social scientists carrying out fieldwork in different parts of the world where lithium production is underway agree that lithium mining is not free from social, environmental and health impacts ([Chave et al. 2021](#); [Mejia-Munzo and Babidge 2023](#); [O'Faircheallaigh and Babidge 2023](#); [Liu and Agusdinata, 2021](#)). However, these impacts associated with lithium extraction are downplayed by governments as they push for the development agenda; as well, they are greenwashed by mining companies as they justify their sourcing of minerals as responsible. Responsible sourcing needs to be reinforced and monitored especially in countries, like Zimbabwe, where several factors- such as weak governance, corruption, compromised civic space and underdevelopment- affect the monitoring and reporting of serious ESG impacts.

While this paper focuses on Zimbabwe, displacements in the country are confirmed by media reports elsewhere in the global south. Recommendations provided here are applicable to all regions where communities are physically, culturally and economically displaced due to urgent extraction of critical minerals. By means of illustrative maps, emerging interdisciplinary studies indicate the distribution of critical minerals in the global south and north, where more research into such displacements must be directed (see for example, [Boafo et al. 2024](#); [Burton et al. 2023, 2024](#); [Owen et al. 2023](#); [Matanzima and Loginova 2024](#); [Maus and Werner 2024](#)). Forced resettlements resulting from critical minerals extraction have not received much attention and more case studies are required to inform subnational, national and

international safeguards and standards for resettlement and responsible sourcing of minerals for the low-carbon energy transition. This research can assist policy makers to develop comprehensive and more ethically informed responses for mitigating climate change. Governments in the global south are also encouraged to design resettlement policies, safeguards and standards that govern resettlements within their jurisdictions. All extractive companies seeking to extract critical minerals must be mandated to abide by these policies.

CRedit authorship contribution statement

Joshua Matanzima: Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

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