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Temporalities of mining and displacement/resettlement in Mozambique's coal frontier

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1. Introduction

With the surge in commodity prices in the 2000s, mining frontiers have expanded across resource-rich countries in the Global South, resulting in a series of instances of mining-induced displacement and resettlement (MIDR) (Kemp et al., 2017; Owen and Kemp, 2015; Lilly-white et al., 2015). For mining companies, the displacement and resettlement of communities are often part of mining operations, closely linked with "a complex set of multiple temporal processes (D'Angelo and Pijpers, 2018: 215)". Mining temporalities include shorter-term effects (e.g., boom-and-bust cycles related to market fluctuations) as well as longer-term effects (e.g., national mining policies) that go hand in hand and often conflict with each other (Kesselring, 2018; Wiegink, 2018). The fluctuation of commodity prices and changes in national policies, such as an increase in mining taxation, also influence the corporate decisions regarding MIDR processes (Oskarsson and Lahiri-Dutt, 2019; Kesselring, 2018). Analysing MIDR processes through the lens of mining temporalities is thus relevant to understanding the ways that companies make decisions about the MIDR processes and what the implications are for the people affected by these processes.

In current studies on mining temporalities and the associated MIDR debates, the impacts of temporalities are mainly examined from the perspective of the lead company, as seen, for example, in Newmont's gold project in Ghana (Boakye et al., 2018; Mares, 2012) or Vale's coal project in Mozambique (Cezne and Wethal, 2022; Lesutis, 2019). These discussions are also increasingly focused on multinationals that extract critical minerals and metals, such as lithium, cobalt, and graphite, in southern Africa (Matanzima, 2024; Matanzima and Loginova, 2024; Namaganda, 2023). However, less attention has been paid to temporalities and MIDR processes shaped by shifts in investors due to the global energy transition agenda observed in coal frontiers. We observe that the established multinationals have divested from coal assets in line with the Paris Agreement, while new investors, less aligned with the decarbonisation agenda, have acquired several coal projects which the established multinationals previously owned (Anglo American, 2022; South32, 2021; Vale, 2022b). More empirical knowledge is needed on how these shifts in project ownership reshape mining temporalities, MIDR processes, and their implications for the affected people's experiences.

This article analyses the community residents' experiences of displacement and resettlement in the coal frontier of Tete Province, Mozambique, as they had to deal with multiple coal mining companies over time. Since the mid-2000s, multinational mining companies, such as Brazilian mining firm Vale and the British-Australian Rio Tinto, arrived in Tete's Moatize District. Among the multinationals, Vale developed the most extensive project to exploit what is referred to as the largest coal deposit on the African continent (Mining Technology, 2020). Vale's large-scale open-pit mining project induced the resettlement of more than a thousand families, and some communities remain under resettlement negotiations (Tsuji and Otsuki, 2023).

Moatize residents' experiences of displacement and resettlement have been further reshaped as Vale officially withdrew from the coal business in Mozambique in 2022, allegedly due to its decarbonisation agenda and when Vulcan, a subsidiary of Jindal Group of India, purchased the project (Vale, 2022b).

Based on ethnographic fieldwork in the Moatize District between 2016 and 2023, we ask: What are the implications of ownership changes during displacement and resettlement processes for the residents? To answer this question, we centre our attention on differentiated corporate displacement and resettlement policies and engagements with national mining policies between the two companies – Vale and Vulcan – and how the differences affect the community experiences. In doing so, the article advances the scholarship on the relationships between mining temporalities and MIDR processes by foregrounding the underexplored implications of shifts in investors for the affected populations.

This article is structured in six sections following this introduction. The next section will review key literature on the relationship between time and space, more specifically, mining temporalities and MIDR. The

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third section outlines the methodology. Subsequently, we introduce the development of coal mining and resettlement in the Moatize District, before analysing the implications of multiple actors' temporalities and how the change of companies reshaped the displacement and resettlement experiences of the community residents. We then synthesise the causal mechanism behind the community residents' insecurities in relation to multi-dimensional temporalities. A concluding section summarises the key findings of the study and highlights its theoretical contribution.

2. Mining temporalities and displacement and resettlement processes

The relationships between time and space have been extensively discussed in the fields of anthropology, geography, and political ecology (e.g., Buttimer, 1976; Massey, 2005; Munn, 1992), and they are considered to intricately influence each other (Massey, 2005; Munn, 1992). Scholars have asserted that time is linked to human activities and thereby produced socio-culturally (Munn, 1992) and is also shaped through institutional and political aspirations (Bear, 2016). The rise of 'neoliberal times' (Mains, 2007) in the late 20th century has reconfigured the time-space relationship to standardise the time towards speeding processes of market transactions (Bear, 2016; Mains, 2007). Such changes are increasingly observed in the mining sector. With the commodity boom in the 2000s, studies have explored the impacts of resource extraction across time and space in the context of the Global South, often conceptualised as rapid and extensive mining frontier expansion (Barlow, 2023; Côte and Korf, 2018; Kirshner and Power, 2015), although in some of these regions, local mining systems predate the frontier expansion (c.f., Côte and Korf, 2018).

Anthropologists assert that mining projects are associated with multiple temporalities with different intervals, rhythms, cycles and rules that constantly change and interact with diverse stakeholders in specific socioeconomic contexts where mining projects are implemented (D'Angelo and Pijpers, 2018; Kesselring, 2018; Wiegink, 2023). While the concept of time is often associated with an objective state (i.e. clock time), the recent focus on mining temporalities refers to the earlier anthropological conceptualisation of time, uncovering how social actors subjectively experience time (Askland, 2018; D'Angelo and Pijpers, 2018). More broadly, collective actors also hold their own temporalities. Mining companies and communities often hold different temporalities, as they are embedded in distinct corporate logics and community cultures and livelihoods (Askland, 2018; Owen and Kemp, 2015). These temporalities are also shaped by or overlap with state temporalities as resource extraction requires governments to prepare or update domestic laws and regulations (Wiegink, 2023), as well as urban planning (Udelsmann Rodrigues, 2022). Market temporalities are also intricately connected to these actors' specific temporalities, particularly corporate temporalities, through the short-term fluctuations in resource prices (Wiegink, 2018) and the longer-term shifts in demand for certain resources driven by the energy transition (Matanzima, 2024; Namaganda, 2023). These corporate, state, community, and market temporalities constantly interact with each other in extractive spaces.

Studies also focus on different dimensions of mining temporalities, such as affective, imaginary, material, and bureaucratic dimensions. While affective and imaginary dimensions are more subjective, material and bureaucratic dimensions are experienced through physical and procedural conditions. The focus on the affective dimensions highlights that individuals and groups of people attribute meanings and emotions to spaces and socio-cultural systems, building a sense of belonging and identity (Askland, 2018; Matanzima, 2024) and, therefore, a sense of loss is felt by local people affected by mining, who experience the disruption to social life that existed prior to mining activities (Askland, 2018).

Different individual and collective actors also actively engage with 'temporal imaginaries' (D'Angelo and Pijpers, 2018: 219). For instance,

previous experiences can influence the present through the promotion of mining heritage in the post-mining period (Martinez-Fernandez et al., 2012). The present also interacts with future imaginaries through mining companies, government, and local populations anticipating upcoming extractive projects, shaping their present actions (Weszkalnys, 2008; Namaganda et al., 2022).

Regarding the material dimension, mining boomtowns are illustrative examples of material transformation in relation to mining temporalities (see Woodworth, 2019). Mining temporalities and degrees of state intervention constantly reshape urbanisation processes (Tsuji and Otsuki, 2023; Udelsmann Rodrigues, 2022), including urban shrinkage experienced when key mining industries scale down (Kamete, 2012; Potts, 2005). The regional built environment also radically transforms as mining industries require a wide range of mining-related infrastructures, such as warehouses, equipment storage, pipelines, road networks, and office spaces (Woodworth, 2019).

The bureaucratic dimension entails rules and procedures. In mining regions, different binding and non-binding rules often overlap. For mining companies, compliance with national laws in the countries in which they operate is mandatory, whereas adherence to international standards, such as the International Financial Corporation (IFC)'s standards for involuntary resettlement, is largely dependent on each company's corporate values (Oskarsson and Lahiri-Dutt, 2019; Wiegink, 2023).

These dimensions of mining temporalities further shape MIDR processes. At any stage of project implementation, mining expansion and associated displacement of a population (or part of a population) occur (Askland, 2018; Owen and Kemp, 2015). To justify mining expansion, mining companies often provide compensation for the displaced, including resettlement projects. The existing body of MIDR literature in the Global South has documented grievances of resettled people, including precarious housing and basic services in the resettlement village, loss of livelihoods, lack of employment, mental health risks and undermining ancestral linkages (Goessling, 2010; Kemp et al., 2017; Owen and Kemp, 2015; Lesutis, 2019; Lillywhite et al., 2015; Namaganda et al., 2022; Matanzima, 2024). Indeed, socio-spatial transformation due to the mining expansion over time greatly affects displaced people's experiences.

Other studies highlight how different actors' multi-dimensional temporalities are entangled, shaping people's displacement and resettlement experiences. Even before mining expansion, the anticipation of displacement influences residents' actions. Those with official land tiles may receive compensation and jobs, but others migrate, seeking alternative livelihoods (Noy, 2023). During mining operations, fluctuation of commodity prices and changes in national policies, such as an increase in mining taxation, can influence companies' future projections, impacting compensation schemes (Kesselring, 2018). Furthermore, mining companies' shorter-term planning for resettlement can conflict with resettled residents' expectations of maintaining long-term relationships (Wiegink, 2018).

More recently, the global energy transition agenda has influenced MIDR processes, yet with divergent impacts depending on the type of resources. On the one hand, achieving a decarbonised society has induced a surge of global demand for critical minerals, such as graphite and lithium. In Zimbabwe, the urgent demand for lithium has exacerbated resettlement outcomes as some mining companies bypass public consultation and consent processes, leaving community residents more impoverished (Matanzima, 2024). On the other hand, the decarbonisation agenda has also led to a significant shift in coal investors in coal-producing regions, as demand for coal persists in certain economies (Gellert and Ciccantell, 2020). While established multinationals have increasingly divested from coal projects in line with the Paris

Agreement, and along with a wider retreat from coal in global financial institutions such as the World Bank,[1] new investors less aligned with the agreement have acquired several coal projects previously owned by multinationals (Anglo American, 2022; South32, 2021; Vale, 2022b). Such ownership changes have generated their own temporalities and have significantly impacted the affective, imaginary, material, and bureaucratic dimensions of different actors' temporalities, as well as the MIDR processes.

In general, company mergers and buyouts in the mining sector are common due to market fluctuation and changes in corporate strategies. However, their implications for community relationships and environmental measures have received little scholarly attention (Hilson, 2011; Tsuji and Otsuki, 2023). The few studies that exist show that a fusion of different corporate cultures might lead to setting (often radically) different goals and implementing Corporate Social Responsibility (CSR) programmes, potentially sidelining the 'inherited commitments' (Hilson, 2011), disrupting or reshaping the temporal contracts between mining companies and the affected communities. As the energy transition agenda is likely to create similar dynamics across different mining regions, and these are already visible in coal mining regions, there is an urgent need for in-depth research on the implications of shifting investors in the middle of these displacement and resettlement processes and how new temporalities are produced and modify or disrupt the different dimensions of mining temporalities and the MIDR processes. To fill this gap, we have carried out fieldwork in Mozambique's coal frontier, where an ownership shift of a major coal project occurred in 2022.

3. Methodology

Our analysis draws on three periods of fieldwork conducted in Tete Province, more precisely in Moatize City (hereafter Moatize), the district capital of Moatize District and in Mozambique's capital city, Maputo: (1) April–May 2016, (2) March 2019, and (3) April 2022–May 2023. The data collection focused on the displacement and resettlement experiences of residents of a coal community inside the Moatize Coal Mine (hereafter the Moatize Mine), namely the Ntchenga community (see Fig. 1). Moatize Mine's owner shifted from Vale to Vulcan in 2022 and the residents of the Ntchenga community experienced shifts in resettlement projects initiated by Vale.

We visited Moatize Mine in 2016 and 2023. In the latter, we visited the forefront of coal extraction in the Mine's Section 2B, which enabled us to better understand the mining expansion process from within the mine. We also participated in two well-attended public meetings concerning the resettlement of two communities, Ntchenga and M'phandwe. M'phandwe is a neighbouring community to Ntchenga, and is also subject to future resettlement.[2] The first meeting was about the physical displacement (loss of shelter) linked to the development of the area of Cava 3 - Section 2B held in October 2022, and the second meeting concerned the economic displacement (loss of assets or means of livelihoods)[3] linked to the development of the area of Cava 2 - Section 2B in November 2022 (see Fig. 1 for the respective locations). Additionally, we also visited the Nhamitsatsi community, the host community of the resettlement village, to observe the ongoing status of the resettlement project, including the construction of a model house built by Vale.

The lead author conducted 43 semi-structured interviews with residents of Ntchenga, Nhamitsatsi and Cateme, government officials,

mining companies' (former) employees, local activists, journalists and other actors involved in the resettlement projects to discuss the impacts of shifting investors on displacement and resettlement experiences of the community residents, particularly those of the Ntchenga community. The lead author is a male from Asia and speaks Portuguese fluently. The interviews and conversations were thus carried out mainly in Portuguese, and as some of the community members only spoke *Nyungwe*, one of the local languages, the research assistants translated these conversations into Portuguese. During the initial period of fieldwork, the author reached out to local communities through the support of a local NGO that has an extensive network within the communities. However, an extended professional and social network reduced this reliance over time, enabling him to conduct fieldwork more independently, while still maintaining a close tie with the NGO.

Interview summaries were categorised by social groups and occupations, enabling the analysis of different temporalities associated with mining companies, state institutions, and community residents. Alongside interview data, we chronologically organised fieldnotes on meetings and observations related to MIDR processes to better understand the temporal impacts. Despite being a foreign researcher, the long-term engagement with the field, and especially with the Ntchenga community between 2016 and 2023, enhanced our understanding of shifting dynamics and residents' experiences over time.

Following the fieldwork, the data from interviews, conversations and participant observation were supported by other primary and secondary sources, including grey literature and online news articles. All participants were anonymised to protect their identities, given the sensitivities surrounding the subject matter.

4. Displacement and resettlement from coal mining in the Moatize District

Coal mining in the Moatize District was developed during the Portuguese colonial era. After Mozambique gained independence in 1975, the state-owned coal company *CARBOMOC* acquired the coal mine (Darch, 2018). However, it did not develop it further after the civil war destroyed the Sena railway that transported the coal in the mid-1980s (Schubert, 2020). In the late 1980s, the Mozambican government was forced to implement the structural adjustment programme and to attract foreign direct investment, especially in the extractive sector (Macuane et al., 2018). In the mid-2000s, multinational mining companies such as Vale and Riversdale (later Rio Tinto) invested billions of dollars in large-scale open-pit coal mining projects in the Moatize District and rebuilding the regional transport networks, linking Tete's coal frontier to port cities and export markets beyond. Tete quickly experienced the boomtown dynamics similar to those observed in other mining frontiers in Western Australia and Canada (Keough, 2015; Lawrie et al., 2011; Marais et al., 2018). Tete City and the old town of Moatize (*Vila de Moatize*) began to rapidly urbanise with an unprecedented inflow of capital and people (Kirshner and Power, 2015; Mosca and Selemane, 2011).[4]

Among Tete's coal projects, Vale's Moatize Coal Project (*Projecto Carvão Moatize)* became the most significant. After Vale won the international bid to develop Moatize Mine, the company gained a 35-year mining concession in an area of about 25,000 ha in 2007 (Human Rights Watch, 2013). The arrival of Vale and soon Rio Tinto resulted in the displacement of more than 2000 households (approx. 10,000 people) from their original locations (Human Rights Watch, 2013; Lesutis, 2019: 116). The companies offered resettlement projects, and Vale alone resettled 1365 households to two newly constructed villages: 25 de

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[1] See https://www.ifc.org/content/dam/ifc/doc/2023-delta/gea-2023-update-1.pdf.

[2] Ntchenga and M'phandwe share a similar trajectory since Vale's arrival as they were not included in the initial resettlement project carried out by Vale yet were impacted by the mining activities over time.

[3] For the definitions of physical and economic displacements, see (IFC, 2012).

[4] In 2020, Moatize was elevated to the category of a city, given socioeconomic and demographic increases. However, compared to other major cities in Mozambique, such as Maputo and Beira, Moatize is much smaller in scale, and it is more like a town or a district capital in reality.
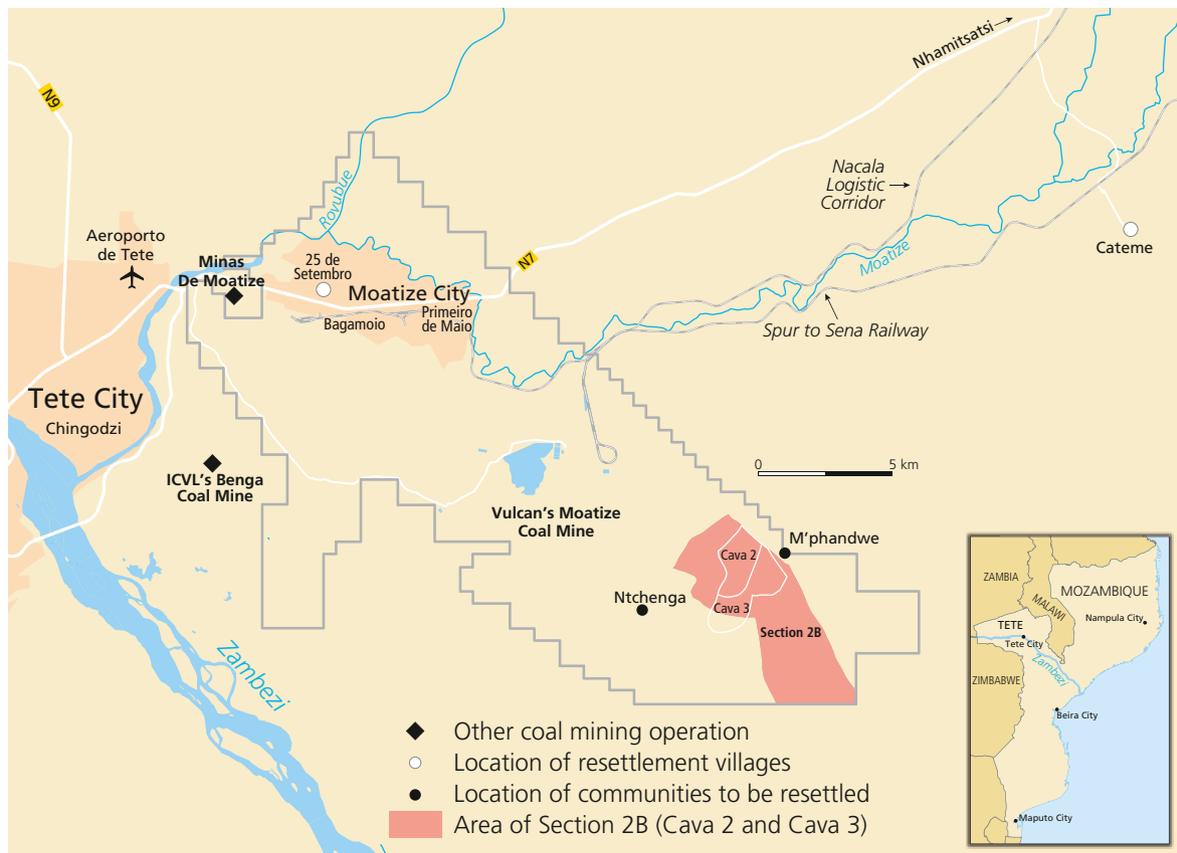
Fig. 1. Locations of the Moatize Coal Mine and the Ntchenga community.

Setembro (inside the town of Moatize) and Cateme (more than 30 km from Moatize).

Vale's resettlement projects received widespread criticism due to their precarious planning and infrastructure, including poor housing conditions, difficult accessibility to water and electricity, and a lack of job opportunities (Human Rights Watch, 2013; Lesutis, 2019). Vale had promised to provide jobs for the resettled people (Cezne and Wethal, 2022). While some people were employed during the initial construction period, short-term construction jobs began to disappear once the mining projects moved into the operational phase, as they required only a handful of skilled workers trained elsewhere (Kirshner and Power, 2015; Cezne and Wethal, 2022). In 2012, the accumulated discontents led around 500 residents from Cateme resettlement village to block the railway line that transported coal to Beira Port, in protest against Vale, leading to a violent clash between the residents and the Mozambican state (Human Rights Watch, 2013).

One reason behind the controversial resettlement process was a lack of a legal framework in Mozambique at that time (Wiegink, 2020). Following the Cateme residents' protest, the government established regulations for resettlement processes resulting from economic activities in August 2012 (Decree No. 31/2012 of August 2012) to respond to increasing global interests and overcome legal inertia. These regulations set principles and broad procedures concerning resettlement processes nationwide. In addition to this decree, the government created two related ministerial orders: one detailing the role and structure of the resettlement monitoring commission (No. 155/2014), and another on the elaboration and implementation of a resettlement plan, including procedures for public consultations (No. 156/2014).

The government also revised the mining law in 2014 (No. 20/2014), which specifies the role of the government in relation to resettlement. The revised law stipulates that the state is responsible for ensuring just compensation for the residents of affected communities by enforcing

national legal instruments governing mining companies. With this situation, the state must protect the mining communities and promote socioeconomic development to guarantee the well-being of its residents.

Despite these legal instruments, residents' well-being in both resettled and non-resettled communities has remained undermined. The residents of Moatize have been economically displaced over time, in some cases without receiving compensation for their losses (Tovele, 2024; Tsuji and Otsuki, 2023). Vale's mining expansion into areas adjacent to the city's boundary has affected the everyday lives of the residents who were not included in the resettlement plan, as it blocked people's access to farmland, grazing and harvesting land, and rivers (Marshall, 2015; Tovele, 2024). Reports also observed increasing air pollution and declining soil and water quality in the area (Marove et al., 2022; Source International, 2019). According to a survey conducted by Source International, an international environmental and health NGO, during the sample period, PM_{10} (respirable particles with a diameter of 10 μm or less) levels in Bagamoio, one of the neighbourhoods that shares boundary with Moatize Mine, frequently exceeded the WHO's limit, with a peak time more than six times higher than the threshold (Source International, 2019: 46-47). These situations have resulted in a series of public protests demanding compensation (Club of Mozambique, 2024; Fernando, 2018).

While the residents remain confined in Moatize, Vale agreed to resettle two communities: Ntchenga and M'phandwe (see Fig. 1). In its Sustainability Report 2018,[5] Vale stated for the first time in the report series that it had begun to evaluate the resettlement of these two communities (Vale, 2019). Subsequently, Nhamitsatsi, nearly 30 km from

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[5] Vale's annual report focusing on ESG topics and community relations in the countries where it operates. Since 2020, the name of the report has changed to the *Integrity Report*.

Moatize, and not far from Cateme, was selected as the host community for the new resettlement village (O País, 2021).

Amid the negotiations for compensation for the loss of access to natural resources and livelihoods, and the new resettlement project with these communities, Vale announced its intention to divest from Tete in January 2021 (Vale, 2021). The company's shifting corporate policy on coal mining appeared to be motivated by a combination of reasons.[6] Vale officially claimed that the divestment was to focus on its core business and low-carbon mining (Vale, 2022b). However, Vale's project in Mozambique was also known as a 'loss-making asset' in the firm's business portfolio, with numerous pending issues with local communities (Reuters, 2021; Tsuji and Otsuki, 2023). After Vale's departure in 2022, and with pending issues unsolved, Vulcan Mozambique, a subsidiary of the Indian private-sector steel company Jindal Steel and Power (JSPL), purchased the Moatize Mine and the associated coal transport network (Vale, 2022b). Since then, Vulcan has been progressively restructuring Vale's project based on the firm's aims and strategies, including the ongoing resettlement project, which Vulcan inherited from Vale upon the mine acquisition.

In what follows, we chronologically examine the implications of this shift in ownership for the Ntchenga community in four phases. Each phase illustrates the varied displacement and resettlement experiences of Ntchenga residents in relation to mining temporalities.

5. Multiple actors' temporalities and Ntchenga residents' displacement and resettlement experiences

5.1. Phase 1: Ntchenga encounters Vale amid the coal boom

Before Vale's arrival, Ntchenga was simply one of the surrounding communities of Moatize.[7] Many residents of this community practised (and still practice) subsistence farming (e.g., maize and vegetables), and others engage in livestock farming (e.g., goats and chickens), fruit harvesting, and firewood production (see Consultec, 2022). Despite some distance, Ntchenga was a vibrant community connected to Moatize by direct road, and many people passed through the community on their way to or from Moatize.

The everyday lives of Ntchenga residents began to change after Vale, lured by high coal prices in the global market, gained the mining concession. Vale's arrival and the subsequent mine installation, with the initial plan to achieve a production capacity of 11 million tons per year (Mosca and Selemane, 2011), meant that the geographical location of Ntchenga, once part of this region's organic landscape, was suddenly incorporated into the official map of the mining expansion plan. Vale's projection of mine development not only cut off their access to Moatize but also made many residents highly vulnerable to constantly changing mining operations.

More specifically, the residents first started to feel the impacts of Vale's operation through the displacement of other communities. Between 2009 and 2010, the neighbouring communities, such as Chipanga and Mithethe, were relocated to the resettlement villages of Cateme and 25 de Setembro (Human Rights Watch, 2013; Vale, 2012) (see Table 1). Although Ntchenga was also initially included in the resettlement plan together with the other communities, Vale later decided to resettle the community only when the mining operation reached the areas close to

Table 1

Key events concerning the development of Moatize Mine and Ntchenga residents' experiences.

Year	National/International	Moatize Mine	Ntchenga Community
2007		Vale signs a mining contract	
	Initial construction demand triggers coal boom in Tete		Vale resettles surrounding communities of Ntchenga
2011		Vale starts coal production	
2012		Protest in Cateme resettlement village	
2013	Conflict between FRELIMO and RENAMO begins		
2014	FRELIMO wins the general election and the conflict intensifies		
2016	FRELIMO and RENAMO achieve a ceasefire	Vale completes an update of Moatize Mine	Ntchenga residents have faced water issues
2017	Business environment improves as coal prices rise	Nacala railway completes	
2018			Vale starts evaluating resettlement of Ntchenga
2021		Vale announces Vulcan as a new mineowner	
2022	Energy crisis leads a surge in coal prices	Vale withdraws from Tete	Vulcan seeks to occupy Cava2
2023			Vucan occupies Cava 2 before resettling the residents

Source: Human Rights Watch (2013); Vines (2019), and compilation by authors.

Ntchenga (Bila, 2015). Nevertheless, when Vale resettled the other communities, the residents of Ntchenga started to experience the destruction of the living environment, including isolation and dispossession of access to basic services, such as education[8] and health centres in their vicinity, which increased their insecurities in living in the area (Tsuji and Otsuki, 2023).

Residents also experienced other impacts. A resident nostalgically recalled that the land they had inherited from their ancestors was a good land without any problems; however, since Vale arrived, the company "shut everything and wasted everything" (Interview with a resident in Ntchenga, April 20, 2016). Vale's expansion meant a change in material conditions. There was a seasonal river nearby, and people used to consume water from this river during the rainy season and from boreholes during the dry season. However, since the company began mining operations, river water became scarce and contaminated (Interview with a resident in Ntchenga, April 20, 2016; Chandamela, 2023). Amid the water issue, the traditional chief of Ntchenga demanded that the Moatize District administrator visit the community together with Vale's representatives and acknowledged the issue (Bila, 2015). Consequently, Vale installed water tanks and began transporting water to the community; however, the water supply from these tanks was (and still is) often irregular and insufficient.

5.2. Phase 2: Vale expands the operations as the business outlook improves

Several years after resettling Ntchenga's outlying communities to Cateme and 25 de Setembro, Vale began to resettle Ntchenga and

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[6] Several reports point to a radical Islamic insurgency in the northern provinces of Mozambique that has restricted mining activities, especially at the large natural gas projects in the Rovuma Basin (see, for instance, Namaganda et al., 2022). The extent to which these insurgencies have impacted Vale's divestment is uncertain. Even so, the impact seems to be minimal since the insurgency is not visible in Tete Province.

[7] According to a socioeconomic study carried out by Diagonal, a Brazilian planning firm, as of 2020, there were 293 people living in Ntchenga (Consultec, 2022).

[8] As of August 2022, there was a resident teacher in Ntchenga who teaches up to fourth grade of primary school.

M'phandwe and expand coal production. In its annual Sustainability Report 2018, Vale stated that it had begun the evaluation process to resettle Ntchenga and M'phandwe (Vale, 2019). Vale's resettlement policy was in line with the company's strategy to increase production capacity by completing the Moatize II Project in 2016. The project added a second coal processing plant (Campbell, 2017), doubling production capacity to 22 million tons per year.

Due to rising global coal prices, the coal business environment improved around 2016 and 2017. Vale's Nacala Corridor—an integrated coal transport network composed of a 912 km railway and a coal terminal, in which Vale invested billions of dollars—finally became fully operational in May 2017 (Club of Mozambique, 2017b). Additionally, these developments in coal infrastructure coincided with the end of the armed conflict between the ruling government and the major opposition party, RENAMO (Mozambican National Resistance), which had severely affected coal transportation and the regional business climate off and on since 2013.[9] During this period, RENAMO gained wider public support by criticising the government for not ensuring inclusive and democratic development, and the party claimed to have won the controversial 2014 general election (Pearce, 2020). After years of negotiations, the government and RENAMO achieved a ceasefire agreement in 2016 (Vines, 2019), which stabilised the region.

As the business outlook improved, Vale planned to occupy the areas subject to Ntchenga and M'phandwe. However, the company decided to expand in stages, rather than a one-time displacement and resettlement. The first occupation would take place in the area called Cava 2, followed by Cava 3, both in Section 2B (Fig. 1). While the mining expansion to Cava 2 should result in economic displacement, affecting the community members' livelihoods and re-routing the access road to and from Moatize, the expansion to Cava 3 should involve physical displacement, transferring the two communities and their assets. In the area of Cava 2, although uninhabited, a consultancy firm identified 72 farmlands and other assets (e.g., fruit trees) (Consultec, 2022). Among the 72 farms, 44 belonged to the residents of Ntchenga and M'phandwe, and the other lands belonged to non-residents (Consultec, 2022). Although the Mozambican constitution stipulates that all land belongs to the state, the effective land law protects the rights of Mozambicans and communities by acknowledging traditional or *de facto* land ownership, while it also permits corporations to have land use rights through a land title system - DUAT (*Direito de Uso e Aproveitamento de Terra*) (Hanlon, 2011). In the area of Cava 2 (also Cava 3), Vale had gained the DUAT from the government (See Human Rights Watch, 2013). However, the *de facto* land ownership by community members remains intact, putting distinct land use rights systems in conflict with each other.

Consequently, Vale did not proceed with the occupation of Cava 2, presumably to avoid another confrontation with local communities. Vale was already planning to divest from Mozambique, and the company had accumulated a number of unresolved issues with local communities, such as pending financial compensation for brickmakers and farmers and complaints about environmental degradation (Tovele, 2024; Tsuji and Otsuki, 2023). In January 2021, Vale officially announced its divestment plan from Tete by acquiring Mitsui's entire stake in the Moatize Mine and Nacala Logistic Corridor[10], aiming to simplify asset management while searching for a potential buyer (Vale, 2021).

In parallel, Vale's reluctance to continue with the occupation plan might have also been related to the growing resistance they faced. An agent of a local NGO explained that Vale was initially showing great interest in occupying the area designated as Cava 2 – Section 2B.

However, residents of the communities, with the support of the local NGO, resisted and were able to put the plan on hold, arguing that before the company could occupy the land, it must first resettle the communities (Interview with an agent of a local NGO, September 6, 2022). At the end, Vale sold the project to Vulcan and left in 2022 without displacing the community residents.

5.3. Phase 3: Vulcan enters amid peak coal prices

A few months after Vale's withdrawal, the community members began to hear that Vulcan would occupy Cava 2 before resettling them. Vulcan's entrance coincided with an unprecedented surge of international thermal coal prices following Russia's invasion of Ukraine (IEA, 2024). When we visited Ntchenga four months after Vale's withdrawal, residents explained that the area designated as Cava 2 was essential to farmers and other members of the community, as this space had multiple uses, such as cutting firewood, grazing cattle and goats, and sourcing water for livestock. However, the residents confirmed that after Vulcan's arrival, the company began negotiating with farmers directly to strike financial compensation agreements for their farmland (Interview with community members of Ntchenga, August 25, 2022).

The negotiations revealed a shift in the bureaucratic dimension of corporate temporalities. Facing Vulcan's pressure to occupy the area, Ntchenga residents continued to resist it. In the last round of the public participation meetings for the physical resettlement project concerning Cava 3 – Section 2B, which took place at the VIP Executive Hotel in Tete City on October 26, 2022, diverse stakeholders participated, including representatives from the two communities, Vulcan's social area manager, Moatize District's administrator, a delegation of the National Directorate of Land and Territorial Development from Maputo, consultancy firm's technicians, and civil society organisations, among others. During the meeting, the traditional chief of Ntchenga openly requested Vulcan not to occupy the area of Cava 2 before resettling its residents, since they would lose access to essential resources in the area. However, Vulcan ultimately occupied the area of Cava 2 before resettling the communities. The community members said that those who owned farms in Cava 2 handed over their land to Vulcan, receiving financial compensation around the beginning of 2023 (Interview with community members of Ntchenga, April 13, 2023).[11]

A few months after the financial deals, we visited Moatize Mine and its Section 2B. We observed the use of explosives to deepen the operations. Days after this visit, we talked to one of Vulcan's employees who was working in Section 2B. He explained that after Section 2B, there are other unexplored sections, such as Section 2C and 2D, emphasising that "there is a lot (of untouched coal deposit) to work on (extract) for a long period of time" (Interview with a Vulcan employee, March 30, 2023). From Vulcan's viewpoint, the rhythm of extraction continued, or even accelerated, independently of the struggles that the community residents experienced or would bear.

The residents explained that although the subsistence farmers were financially compensated, they were forced to find alternative farmlands elsewhere (Interview with community members of Ntchenga, April 13, 2023 and August 25, 2022). This increased the sense of loss and future insecurity among them.

5.4. Phase 4: Will Vulcan follow Vale's resettlement plan?

The biggest question that Ntchenga residents currently face is whether Vulcan will follow Vale's plan. The new resettlement village in Nhamitsatsi is planned to be equipped with basic infrastructure (e.g., health centres, schools, areas for recreation), in addition to individual

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[9] See https://www.reuters.com/article/mozambique-security/rpt-update-3-rio-suspends-mozambique-coal-exports-over-security-fears-idUSL5N0F24MX 20130626/.

[10] Mitsui had a 15% stakes in Moatize Mine and a 50% stakes in Nacala Logistics Corridor before its exit.

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[11] An agent of a local NGO and their local collaborator in Ntchenga also confirmed that the farmers have handed over the cultivating land and received compensation from Vulcan (personal communication, 4 June 2025).

houses, creating an urbanised living environment (O País, 2021). From the beginning, Vale mainly led the resettlement planning and the public consultation processes. However, the resettlement project was handed over to Vulcan before it moved to the implementation stage. In the aforementioned meeting concerning the resettlement project in Cava 3, after the consultancy firm presented the future resettlement project, Ntchenga's traditional chief reacted by stating, "We are ready to be resettled. We ask Vulcan to implement the resettlement in the way that was presented today." Although Vulcan's official stance on resettlement is not widely known,[12] Vulcan is unlikely to implement the resettlement project in accordance with Vale's plan as the chief requested.

First of all, Vulcan has a different displacement and resettlement policy than Vale's. For resettlement, Vale clearly claims that the company designs and implements resettlement projects, including the one that involves Ntchenga, following international standards, such as the IFC's Performance Standard 5 and the World Bank's ESS 5.[13] However, unlike national laws, adherence to these international standards is voluntary, based on each company's resettlement policy (see Wiegink, 2023). While Vale actively followed international standards throughout its operations, and in relation to resettlement, Vulcan has shown less engagement with these global norms (Carta de Moçambique, 2022; Interview with a senior officer of the coal industry, November 3, 2022). This shows that both bureaucratic and imaginary dimensions of corporate temporalities have shifted with the entrance of Vulcan.

A lower degree of adherence to international standards can be anticipated. This is because other Indian companies operating in Tete, such as International Coal Venture Limited (ICVL), a state-owned Indian company, and Jindal Africa, which shares the same parent company as Vulcan, are widely known for having inadequate resettlement policies that do not follow international standards (Oskarsson and Lahiri-Dutt, 2019). An example of the ownership shift in Benga Mine, a coal mine next to Moatize Mine, can illustrate this. In Benga Mine, Rio Tinto, which actively followed international standards in its operations, sold the Mine to ICVL in 2014. ICVL was far less interested in investing in resettlement, leaving the affected population unattended, especially during the downturn of international coal prices (Oskarsson and Lahiri-Dutt, 2019; Wiegink and Kronenburg García, 2022). ICVL even tried to divert the already agreed resettlement plan after its acquisition.

A former community relations officer who served Rio Tinto and ICVL stated that after Rio Tinto's withdrawal, a delegation from the ICVL's headquarters in India arrived to discuss with the Mozambican government the possibility of bringing prefabricated houses from India to lower the costs, however, the government opposed this plan (Interview with a former ICVL's community relations officer, March 17, 2023), potentially considering the previous controversies surrounding resettlement projects. Due to this tendency to focus on cutting costs, ICVL took nearly eight years to hand over the M'boza resettlement village to the residents of the Capanga community, an unfinished resettlement project of Rio Tinto (Club of Mozambique, 2022). This suggests that after Vulcan assumed control of Vale's unfinished resettlement project, its approach to the project can be similar to ICVL's.

The shift in ownership from Vale to Vulcan has also likely altered how the lead company complies with national mining policies concerning resettlement. Following the first resettlement project, which received widespread criticism, Vale ensured that the new resettlement project would strictly comply with national legal obligations (Zitamar News, 2020). However, the extent to which Vulcan complies with Mozambican bureaucracies and regulations remains unclear, as reports show that Vulcan has already breached legal requirements. For example, after Vulcan's takeover, local residents began experiencing worsening air pollution and submitted a joint letter to the company (Club of Mozambique, 2024). Following the multisectoral committee's

assessment of the case, the Minister of Land and Environment requested that Vulcan substantially revise its environmental management plan, the key document in mining planning related to the environment, and to strictly comply with the legal instruments (Diário Económico, 2024). In addition, under Article 30 of the Mining Law, mining activities must comply with national legal instruments on environmental protection and preservation, including social, economic, and cultural aspects, and Vulcan's engagement with such instruments remains unclear.

Vulcan's general undermining of Mozambique's national legal instruments is concerning for community relationships, given that Jindal Africa, Vulcan's sister company, has also been found to have ignored judicial orders. Jindal Africa and the Mozambican government were accused of not proceeding with the resettlement of the Cassoca community in the Marara District, Tete Province, after the resettlement plan was approved in 2013, while the community residents remained living close to the extraction sites (Justiça Ambiental, 2018). The Indian company was also ordered to shut down the dry port for coal deposits, located in the heart of Moatize, due to air pollution (Club of Mozambique, 2017a). These accounts suggest that, although the state's temporalities have evolved through the establishment or updating of legal frameworks for mining and resettlement, enforcement remains insufficient, posing challenges for local residents. Examining the actuation of both Jindal Africa and ICVL in Tete,[14] Oskarsson and Lahiri-Dutt (2019) note that Indian managers tend to avoid making social investments until they are 'forced' to do so by public protests, echoing ICVL's and Vulcan's reluctance to comply with the legal obligation. In sum, a former ICVL's community relations officer, based on years of experience in serving ICVL:

As the (Mozambican) state or Mozambicans, we must pay close attention (to Indian companies); otherwise, many things will not be done according to papers (e.g., agreements) and will be done differently without monitoring (Interview with a former ICVL's community relations officer, March 17, 2023).

By the same token, despite the increasing need for stronger state intervention to protect the interests of the affected communities, studies have long questioned the Mozambican state's ability to adequately oversee extractive projects and channel the benefits for broader socioeconomic development (Castel-Branco, 2014; Schubert, 2020). This inability is often attributed to the high dependency of state revenues on extractive projects and the private interests of FRELIMO (ruling party)'s elites (see Macuane et al., 2018). The changing corporate temporalities require the state temporalities to align and vice versa. However, the extent to which the Mozambican state will be capable of enforcing the national legal obligations and the inherited commitments remains a question.

Asked about the potential implications of the ownership shift for the resettlement project, a Moatize District Government official shared a rather optimistic view, stating that things are registered and documented, and Vulcan will have to follow what Vale had planned (Interview with a Moatize District government official, December 6, 2022). On the ground, we have already witnessed signals of changes in the resettlement process, which affect the community residents' experiences. One of the challenges that Ntchenga residents currently face is the ongoing delay in the resettlement process. While delays in resettlement projects are common (see Owen and Kemp, 2015; Witter and Satterfield, 2019), during the time lag between the resettlement decision and actual resettlement, those subject to resettlement often experience a lack of essential investment in their original locations, given that their permanence in the area is deemed temporary (Witter and Satterfield, 2019). Ntchenga residents had been previously informed that the construction of the resettlement village would start in January 2023, and the

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[12] See https://www.vulcaninternational.com/.

[13] See https://vale.com/esg/involuntary-resettlement.

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[14] There are differences in the nature of the companies. Whilst ICVL is a consortium of Indian state-owned companies, Jindal Africa is owned by Jindal Group, a family-owned private conglomerate in India.

resettlement would occur in the following year. However, Vulcan only started construction of about two hundred houses in the future resettlement site in Nhamitsatsi in January 2024, with the intention of concluding the construction work by January 2025 (Rádio Moçambique, 2024).[15]

The continuously delayed resettlement process has further increased the instability felt by Ntchenga residents, whose living environments have already been degraded and who have had to continue relying on temporary solutions. Even with resettlement houses, uncertainty remains. Originally, Vale contracted a company to build a 70 m^2 model house, which was later approved by the Mozambican government and the residents to be resettled (Vale, 2022a). While it would be ideal if the same construction company continued to build the remaining houses after Vulcan's takeover, a resident of the host community Nhamitsatsi said that the company might not build the rest of the houses (Interview with a resident of Nhamitsatsi, April 13, 2023).[16] To what extent Vulcan will transform the ongoing resettlement project inherited from Vale, including the material structure of the resettlement houses and implementation of livelihood restoration programs, is not known at the time of this writing. However, changing corporate temporalities driven by the ownership shift and its consequences have increased the sense of insecurity among Ntchenga residents about the implementation of the resettlement project. In the absence of the state proactively protecting the community residents' interests and well-being, Vulcan's resettlement project will likely lead to further degradation of their living environments, even in the future resettlement village.

6. Discussion: Multi-dimensional temporalities and local residents' insecurities

The ownership change from Vale to Vulcan has disrupted temporalities shaped primarily through Vale's investments backed by the coal boom and the state's support. The shift primarily altered the bureaucratic and imaginary dimensions of corporate temporalities, leading to inconsistent applications of the existing social and environmental standards. This was clear in the changes to displacement and resettlement policies, as the two companies envision different levels of compliance with international standards and national legal frameworks. As illustrated in Phase 4, compared to Vale, Vulcan has less strict corporate policies on compliance with international standards and national mining policies. These temporal disruptions can impact Ntchenga residents' imaginaries of future resettlement, as there is a greater chance that the project will be rearranged. The shifting corporate temporalities have also increased the importance of the role of the Mozambican state as a guardian of citizens' rights, as highlighted by the statement of a former ICVL community relations officer. However, the state's bureaucratic rhythms and monitoring capabilities lag behind the pace of shifting corporate temporalities, leaving Ntchenga residents vulnerable to change.

Furthermore, Vulcan's decision to advance with phased displacement, by physically occupying Cava 2 first and Cava 3 at a later stage, is likely to delay the resettlement process, while enabling the company to continue extractive operations. The physical mining expansion has caused changes in both material and affective temporalities for Ntchenga residents who lost material access to the vital livelihood resources in Cava 2. The occupation has also impacted the affective dimension of community temporalities. Vulcan occupied Cava 2 with a promise that the residents would be resettled in the near future; yet, due to the delay in resettlement, they have been forced to remain in the area, temporarily adjusting to new situations while remaining uncertain about when they are to be resettled.

More broadly, market temporalities associated with coal, including price volatility and shifting global imaginaries of coal in relation to the decarbonisation agenda, have directly influenced the imaginary dimension of Vale and Vulcan's temporalities. Climate change has roughly divided coal into economic (market prices) and environmental (climate costs) values, prompting uneven coal investment strategies among the mining companies. The increased consideration of the environmental costs of coal has (at least partly) prompted Vale to withdraw from Tete, while steady coal demand in India and high coal prices have led Vulcan to accelerate the mining expansion into Cava 2. These varied corporate temporalities are shaping the Ntchenga community's temporalities, especially affective, imaginary and material dimensions, deepening their sense of insecurities.

7. Conclusion

Drawing on the experiences of residents of the Ntchenga community in the Moatize District, Tete Province, Mozambique, this article has examined how mining temporalities, especially changes in lead investors, shape and reshape community residents' experiences of displacement and resettlement in a coal frontier. We have shown that the ownership change from Vale to Vulcan has significantly reshaped the 'temporal contract' between the mining company and the affected communities, creating discrepancies between how Vale conceived and operationalised this resettlement and how Vulcan now intends to (further) implement it. These changes, in turn, greatly reshape resettlement experiences and force the community residents to cope with increased long-term uncertainties regarding the resettlement project.

Conceptually, this article has contributed to extending our understanding of mining temporalities by focusing on the understudied implications of shifts in investors for an ongoing MIDR process from a perspective of multiple actors' temporalities across different dimensions. Each mining company has varying policies with distinct aims and processes concerning MIDR. When a shift in investors occurs, the extent to which the new investor considers the shared experiences and accumulated dialogues between the previous mining company and the affected communities will largely depend on the new company's policy and engagement with national mining policies. The shifting investors pose challenges to the claim that some displacement scholars assert, which is that, if effectively implemented, resettlement can offer development opportunities and improve displaced people's living standards (see Cernea and Maldonado, 2018; Vanclay, 2017). This argument is often based on an assumption that the resettlement project is designed and implemented by a single company, overlooking the potential implications when multiple companies are involved, which can undermine consistency across resettlement projects.

As the decarbonisation agenda is likely to continue reshuffling coal investors across coal-producing regions in the Global South, there is an increasing need for host countries to effectively monitor these processes and, if necessary, strengthen legal instruments to protect community residents' interests and improve long-term resettlement outcomes. We have shown that the focus on temporalities helps us to understand that the necessary alignment between corporate, state, community, and market temporalities is prone to disruption following ownership change, and this insight can be useful for broader debates on the expanding green minerals frontiers and communities' futures in the post-coal frontier spaces.

CRediT authorship contribution statement

Hiroyuki Tsuji: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Kei Otsuki:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization. **Griet Steel:** Writing – review & editing, Supervision, Conceptualization. **Joshua Kirshner:** Writing –

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[15] As of this writing, the construction of the resettlement village in Nhamitsatsi is still underway.

[16] Several individuals later confirmed that Vulcan contracted multiple companies to build the rest of the houses and other infrastructures.

review & editing, Supervision, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

Data will be made available on request.

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