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Changing labour dynamics in the decarbonisation process in Mozambique's coal frontier

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ABSTRACT

Scholars argue that the rise of neoliberal mining and outsourcing has created a more fragmented working class and precarious working environment for mineworkers in the global South. Less examined is how climate change and the decarbonisation process have further restructured the labour dynamics. In the late 2000s, with the surge in global commodity prices, Tete province in Mozambique emerged as a coal frontier. However, long-established multinational mining companies gradually divested from their coal ventures, partly responding to international calls for decarbonisation. Since then, Indian companies have entered the frontier. The shifts in ownership have restructured the projects and their labour dynamics in Tete. Drawing on ethnographic research, this article argues that Indian investors have further fragmented the existing class relations and worsened already precarious labour conditions in Tete. As the coal economy persists, the authors expect to see more variations in the nexus between shifting investors and changing labour dynamics across coal-producing countries.

KEYWORDS

Decarbonisation; coal mining; labour; class relations; Mozambique

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Introduction

Since the late 1990s, neoliberal economic reforms have significantly transformed the mining sector in the global South (Bridge 2004), especially in the production of coal. The reform led to more favourable investment conditions and attracted multinational mining companies to rush into untouched coal reserves. The origins of these companies became diverse, varying from long-established multinational mining companies to new investors from emerging economies; alongside this has been a developing discourse of South–South cooperation (see Cezne and Wethal 2022; Dye, Alencastro and Soares de Oliveira 2024). Although their investments have bestowed host countries with greater leverage in shaping project arrangements, mining companies have also perpetuated or even intensified pre-existing conditions and challenges for host societies, including labourers (Cezne and Wethal 2022). The existing scholarship analyses such transformations associated with labour dynamics, such as the rise of subcontracting and labour segmentation (Manky 2018; Rubbers 2020), the mechanisation of mining activities leading to reduced workforce demand (Kirsch 2014), and the enforcement of stricter safety guidelines to ensure non-interruption of production (Musonda and Pugliese 2021).

More recently, climate change and global decarbonisation processes have been further reshaping the global coal industry and labour dynamics. The status of coal has declined substantially as it causes high emissions of greenhouse gases. Consequently, a significant shift in coal investors has taken place, including in Africa. Before the 2010s, there were broadly two types of major coal investors: one consists of long-established multinationals which considered coal as a major commodity for global markets. These multinationals were mainly from the global North, such as BHP Group and Rio Tinto, but also included long-standing mining giants such as the Brazilian Vale. The second type consists of companies from emerging economies which had high domestic demand for coal, such as China and India (Fernández Alvarez and Arnold 2020). In the 2010s, the global decarbonisation process led the established multinationals, aiming for carbon neutrality by 2050, to reduce their exposure to coal (see Rio Tinto 2018). In contrast, Chinese and Indian state-owned companies, such as the China Energy Investment Corporation and Coal India, became leading coal producers, driven by the increasing in-house coal demand and relatively more relaxed net-zero targets (of 2060 in China and 2070 in India, respectively) (Fernández Alvarez and Arnold 2020).

While established multinationals have become reluctant to hold coal assets in their business portfolios, new investors, including those from the emerging economies less aligned with the decarbonisation agenda, have acquired several coal projects previously owned by multinationals, as testified by the sales of Anglo American and Vale in 2022 and South32 in 2021 (South32 2021; Anglo American 2022; Vale 2022). The new investors have varying strategies and positions, and their impacts on coal-producing regions can be far-reaching. Nevertheless, little attention has been paid to the ways in which the shift in investors has reconfigured mining projects in Africa and, in particular, in relation to the labour dynamics and working-class relations on the ground.

Mozambique is an illustrative example to analyse such changes in the global coal sector. In the late 2000s, with the surge in global coal prices, Tete province

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in central Mozambique emerged as a global coal frontier. Two long-established multinationals – British–Australian Rio Tinto and Brazilian Vale – developed coal mines together with multimodal coal transport networks, investing billions of dollars in this infrastructure. This created temporary job opportunities locally but also increased disparities in labour conditions among workers (Kirshner and Power 2015; Cezne and Wethal 2022).

However, over the last 12 years, Rio Tinto and Vale have divested from coal projects in Tete. These decisions were influenced by external pressures to reduce coal-related projects in their portfolios in line with the net-zero agenda (Rio Tinto 2018; Vale 2022), along with a wider retreat from coal in global financial institutions such as the World Bank (see IFC 2023). After their withdrawals, Indian companies bought up the projects in Tete. This followed the pattern of Indian private companies, including family-owned businesses, leading Indian investment in Africa, in some cases with links to the historic Indian diaspora in southern Africa (Dye 2022; Dye, Alencastro and Soares de Oliveira 2024). In Mozambique, both Indian public and private capital is present in coal ventures, at least partly drawn by the high demand in India for both thermal and metallurgical coal (Oskarsson and Lahiri-Dutt 2019), and supported by the Mozambican state which is also committed to coal development (República de Moçambique 2014).

Against this backdrop, this article examines the changing labour dynamics driven by the shift in coal investors from multinationals to Indian investors in Tete. It builds on ethnographic research carried out between 2016 and 2023 during which the lead author conducted 33 in-depth semi-structured interviews with coal workers, including local coal workers from Tete, national workers from outside Tete, and expatriates; and participant observation in the mining region. The research focused on addressing the question: how have the new Indian investors transformed the projects initially developed by the established multinationals and what are the implications for labour dynamics and class relations? To answer this question, the article shows three areas of transformation: restructuring of the composition of subcontracting companies and their workers; radical optimisation of the mining operations and labour management; and shifts in safety culture, understood here as 'a new way of perceiving and being that workers have to embody' (Musonda and Puglise 2021, 58).

The next section reviews key literature on the labour dynamics and class relations in the preceding neoliberal mining and the ongoing decarbonisation processes, which is followed by the methodology. The study then introduces the historical trajectory of coal mining and labour dynamics in Tete, before it delves into the implications of shifting coal investors for labourers and class relations. The final section summarises the study's key findings and reflects broadly on the transformative effects of decarbonisation processes in Africa.

Labour dynamics and class relations under the decarbonisation process in Africa

In the post-independence period in Africa, new African governments nationalised mining projects which were previously owned by mining corporations headquartered

in the global North (Nkrumah 1965). Until the 1980s, state companies predominantly owned mining projects in most parts of the global South (Hogenboom 2012; Rubbers 2021a). These companies often played a dominant role in mining regions and established 'corporate towns'. They provided welfare services, housing and education for workers and their families, creating strong ties between mine owners and mineworkers. Some observers consider these labour management strategies 'paternalistic', supporting aspects of social reproduction (see Ferguson 1999).

In the mid 1980s, state-owned companies often faced economic stagnation due to decreased mineral prices, global economic downturn and accumulated debts (Hogenboom 2012; Zajontz 2022). The International Monetary Fund (IMF) and the World Bank consequently imposed structural adjustment policies and encouraged (or coerced) indebted countries to adopt neoliberal mining policies to attract foreign investors (see Bridge 2004). The favoured investment conditions and higher resource prices enabled multinationals to expand into areas in the global South with previously unexplored resources, especially in Africa, expanding the extraction frontiers and using new technologies such as fracking and deep-sea mining (Bowman et al. 2021) However, this simultaneously increased foreign investment dependencies, which also affected labour dynamics.

Southern Africa's mining regions have a long tradition of migrant labour systems (Ferguson 1999; Chinguno 2013; Rubbers 2020). South Africa's economy thrived through mining and has a tradition of trade unionism, especially since the 1970s (Marshall 2023). Multi-ethnic (cross-border) immigrant workers, including from Mozambique, played a crucial role, forging a fragmented class structure (Chinguno 2013). In contrast, the Mozambican economy was predominantly agrarian. In central Mozambique, although Tete's coal sector employed a local workforce to some extent, many sought to work in mines and plantations in neighbouring countries throughout the twentieth century, and in contract farming for the tobacco industry since the 1990s, increasing income disparities and fragmenting the regional class structure (Pérez Niño 2017).

Bernstein's analysis highlights that under the neoliberal structure, different labourers shape more fragmented classes that do not form a classic sense of the 'working class' against capitalists (Bernstein 2006, 2026). Contrasting labour practices of state-owned mining companies in the mid twentieth century with those of contemporary mining companies in the African Copperbelt region, Rubbers (2021b) argued that neoliberal mining has rendered workers more fragmented and precarious. One notable feature is reliance on flexible subcontracted workers (Rubbers 2021b), diverging from the state-owned mining companies which directly employed mineworkers under similar working conditions. This increased workforce fragmentation and has widened class inequalities between well-off expatriates and foreign technicians, and skilled nationals and unskilled local workers (see, for example, Rubbers 2020). A more precarious working environment is linked to relatively fewer job opportunities due to mechanisation, digitalisation and other technological changes in the mining works (Kirsch 2014) and fewer welfare benefits granted to workers (Rajak 2016).

In South Africa, some observers have found that the fragmented workforce, characterised by divisions along skill and ethnic lines, and tightened labour control

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within platinum mines have undermined labour conditions (Chinguno 2013; Stewart, Bezuidenhout and Bischoff 2020). In 2012, the precarious working conditions and distrust towards the trade union led operators to embark on a wildcat strike at a mine in Marikana, a major platinum mining area in North West province, which resulted in the massacre of 34 mineworkers by the police (Chinguno 2013).

Among the different types of workers, those who are subcontracted epitomise fragmented and precarious workers. They typically receive lower wages and fewer benefits than direct employees, despite having similar jobs and qualifications (Manky 2018; McNamara 2021). Their jobs tend to be insecure, as they depend on whether their employers (the subcontracting companies) can secure contracts with mining companies (Rubbers 2020), which can result in rolling layoffs and rehirings of the workforce (McNamara 2021).

While these core features remain consistent, differing operational structures and strategies among mining companies lead to varied company–labour relationships. Long-established multinationals have strong global integration, often through membership at the International Council on Mining and Metals (ICMM), engaging with environmental, social and governance (ESG) values, diversified shareholders in Western stock markets, and international standards (Oskarsson and Lahiri-Dutt 2019; Musonda and Puglise 2021; Maybee, Lilford and Hitch 2023), which influence their labour practices. The relatively less-established multinationals based in emerging economies engage less with these aspects. For instance, Chinese and Indian mining companies overseas rely less on global financing and often employ more labourers from their home countries than established multinationals (Oskarsson and Lahiri-Dutt 2019; Rubbers 2020).

These differences are seen most clearly in the process of implementing the decarbonisation agenda. Established multinationals are facing increasing pressure from activists and shareholders to divest from or phase out fossil-fuel projects in countries such as Nigeria, South Africa and Mozambique. The phasing out of coal has been prioritised given that it is the largest source of global CO_2 emissions (IEA 2023). However, persistent demand from Asian countries has impeded its phasing out in many coal-producing regions (Cardoso and Turhan 2018; Gellert and Ciccantell 2020).

The extraction of coal and other high-carbon energy resources therefore continues in southern African countries, given their challenges in shifting towards renewable energy sources due to limited financial and technological capacities (Power et al. 2016; Goldthau, Eicke and Weko 2020). In these countries, including Mozambique, investors from emerging economies such as Brazil, China and India have become increasingly prominent over time, often through the South–South narrative (Power et al. 2016; Dye, Alencastro and Soares de Oliveira 2024).

The decarbonisation agenda has divided companies into those still committed to coal projects and those that are not, even among investors from emerging economies. With relatively looser net-zero targets, Chinese and Indian companies have become relevant players. While Chinese companies invest more in coal-fired plants abroad (Reuters 2025), Indian firms, such as Jindal Steel and Power (JSPL) and Tata, engage in international coal production (Oskarsson and Lahiri-Dutt 2019). Meanwhile, Vale decided to divest from a major coal project in Mozambique in 2022

(Vale 2021, 2022), in line with Brazil's target to achieve net zero by 2050. Despite Vale being a mining company from an emerging economy, its coal operation mainly targeted global markets, and its policies are similar to the established multinationals headquartered in the global North.[1]

Studies are emerging on labour dynamics in the extractive dimensions of the clean energy transition, including in graphite and cobalt sectors (Rubbers 2021a; Namaganda 2023), yet changes in labour dynamics in fossil fuel projects, also shaped by the energy transition in forms of shifting investors, are understudied apart from the implications of mine closures for workers (see Wang and Lo 2022). Understanding how recent coal divestments and shifts in investors have affected coal workers' labour conditions amid growing class fragmentation and precarity under neoliberal mining is timely, as coal projects in the global South are being rapidly reconfigured through the decarbonisation agenda. Tete's coal frontier is an ideal space to observe these labour dynamics and class relations.

Methodology

The lead author conducted ethnographic fieldwork on coal workers in two coal mines: Benga Coal Mine (hereafter Benga Mine) and Moatize Coal Mine (Moatize Mine) in April 2016, March 2019, and between May 2022 and April 2023 (see **Figure 1**). Both projects share similar histories with adjacent locations, but the shift of lead company occurred in Benga in 2014 and in 2022 in Moatize. The difference in ownership sequencing suggests that the changing labour dynamics of coal workers are at different stages.

To study the lived experiences of coal workers, the lead author visited Moatize Mine in 2016 (when owned by Vale) and 2023 (when owned by Indian Vulcan), which included visits to one of the operational mining pits – Section 2B (Secção 2B), the equipment maintenance site, a subcontracting company's office and the main canteen. He also observed different mining operations (extraction, hauling, drilling) and the safety measures implemented inside the mine.

The lead author conducted 47 semi-structured interviews and noted seven informal conversations with different stakeholders linked with the coal industry between 2016 and 2023. These included 14 semi-structured interviews with (former) workers employed directly by mining companies and 19 semi-structured interviews with (former) subcontracted workers employed by companies subcontracted by mining companies. He also interviewed subcontracting companies' human resource (HR) managers, trade unionists, government officials and other industry actors. Visits to social gatherings, restaurants and bars enabled more informal conversations. The lead author is a Japanese male, fluent in Portuguese and English. The interviews and conversations were thus carried out mainly in Portuguese, and in English with some English-speakers, including subcontracting companies' project managers and skilled mineworkers from outside Mozambique, such as from South Africa, Zimbabwe and India.[2] Prior to data collection, he had lived in Maputo for a few years, working for a diplomatic mission. During his fieldwork, he noted that some mineworkers were reluctant to interact with an outsider beyond their work environment. This challenge

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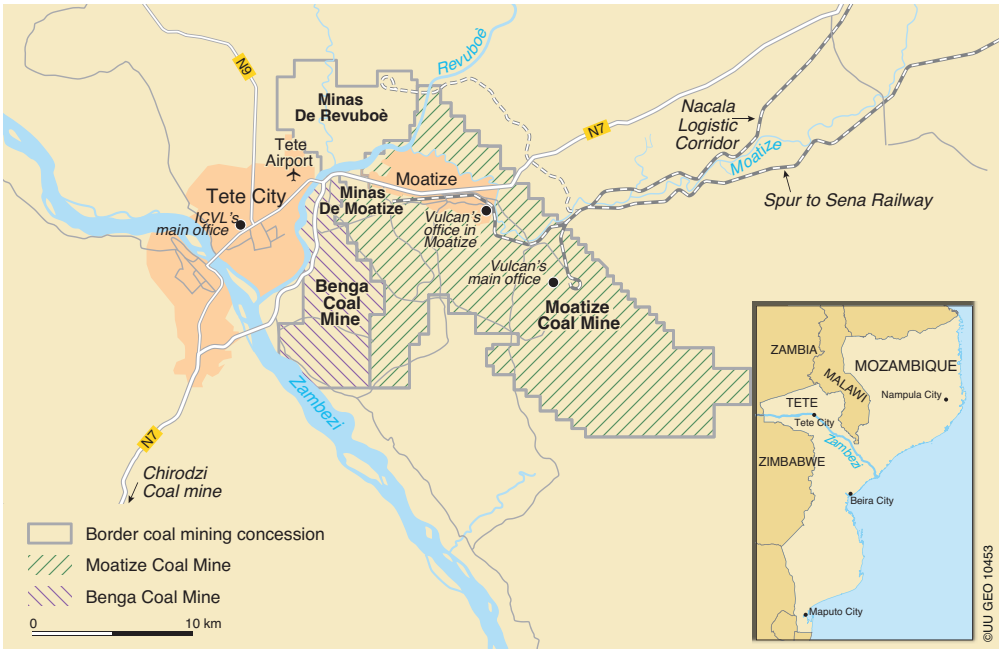

Figure 1. Study area map showing the location of the Moatize and Benga coal mines and the Sena and Nacala coal transport railways.
Source: Utrecht University, Faculty of Geosciences, Department of Communication & Marketing – Cartographic Design.

was mitigated by using the snowball sampling method, relying on an extended social network in Tete. Upon data analysis, online news websites, mining companies' websites, policies and annual reports were used to complement and corroborate the empirical data. The next section reviews the development of coal mining and labour dynamics in Tete from the mid twentieth century onwards.

Development of coal mining and labour dynamics in Tete

During the Portuguese colonial era, the Mozambican Coal Company (Companhia Carbonífera de Moçambique) was established in 1948 under António de Oliveira Salazar's Estado Novo, which was a corporatist regime. After Mozambique gained its independence in 1975, the Mozambique Liberation Front (Frelimo)-led socialist government advanced with the nationalisation of enterprises. A state coal company, CARBOMOC, received cooperation and technical assistance from the former East Germany (GDR) and the USSR to develop the Moatize Mine. Due to the civil war, coal production stagnated by the mid 1980s (Schubert 2020). In 1987, Mozambique implemented the IMF and World Bank's structural adjustment programmes (SAPs) (Marshall 1990), which led to neoliberal reforms across its political economy. In 1994, the first multiparty parliamentary elections were held and the Mozambican

government started to attract foreign direct investment into mining and other sectors. However, the coal industry stagnated until the mid 2000s as the Sena railway, the sole railway transporting coal at the time, was damaged during the civil war.

The Mozambican coal industry experienced a revival under established multinationals, beginning when Vale gained the mining concession in 2004. Vale invested billions of dollars in both the development of Moatize Mine and the rehabilitation and construction of the Nacala Logistic Corridor, a 912-kilometre railway line that connects Moatize Mine to Nacala-à-Velha port on Mozambique's northern coast. Following Vale, the Australian Riversdale Mining arrived in Mozambique in 2006 (Mosca and Selemane 2011). In 2011, Rio Tinto gained control over three mines – Benga, Zambeze and East Tete (with Benga being the only operational mine) – by acquiring Riversdale Mining for US$3.7 billion (Rio Tinto 2012). Vale and Rio Tinto, together with the World Bank, also invested in the regional infrastructure network by rehabilitating the Sena railway.

In Tete, the revived coal industry in the late 2000s boosted job opportunities, especially during the construction phase. While the exact number of temporary jobs created is unknown, Resenfeld (2012) estimated that roughly 25,000 jobs were generated. During this time, many Tete and Moatize locals acquired simple construction jobs. The coal boom also attracted domestic migrants from other regions, with and without professional skills (Mosca and Selemane 2011), and expatriate workers arrived to take up managerial positions and technical and engineering roles, fragmenting the class structure (Mosca and Selemane 2011; Kirshner and Power 2015).

Class and racial issues became accentuated when the projects moved to the operational phase, as mining companies needed only a limited number of skilled workers to run the operations and laid off many unskilled workers (Kirshner and Power 2015; Marshall 2023). Mozambican workers complained about being excluded from certain roles as Vale at times prioritised Brazilian workers over qualified Mozambicans (Cezne and Wethal 2022). Foreign subcontracting companies often preferred (semi-)skilled immigrant workers from neighbouring English-speaking countries such as Zimbabwe and Malawi. Labour importation also fuelled ethnic tensions among Mozambicans. The perception that better-educated workers from southern urban centres (especially Shangaan and Ronga ethnic groups) and abroad were gaining better employment terms generated discontent among Nyungwe-speaking locals (Kirshner and Power 2015; Cezne and Wethal 2022).

Two major strikes occurred at Moatize Mine in 2016 and 2017, involving thousands of Vale's own employees who disputed bonuses and reduced salaries (Reuters 2016; Diário de Notícias 2017). Vale's employees faced a situation shaped by a close relationship between Vale and the Mozambican state, with trade unions limited in their ability to protect workers' rights around arbitrary dismissals, safety concerns and complaints about racism (Cezne and Wethal 2022; Marshall 2023).

Weak business performance and growing recognition of climate change during the 2010s pushed the multinationals to divest from Tete. First, Rio Tinto announced its divestment from Tete in 2014, citing the difficult business environment and logistical constraints (Antonioli and Regan 2014). While Rio Tinto did not officially relate its withdrawal to the energy transition, it began divesting from coal in the early 2010s (Grigg 2015; Rio Tinto 2018). In 2022, Vale also divested from Tete, claiming

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to focus on its core mandate and become a leader in low-carbon mining (Vale 2022). Vale's project in Tete was known as a loss-making asset with troubled community relations due to controversial resettlement, compensation claims and environmental degradation (Reuters 2021; Tsuji and Otsuki 2023).

After the withdrawal of these multinationals, Indian firms purchased both Moatize and Benga mines. International Coal Ventures Limited (ICVL), an Indian consortium of state-owned firms, bought Benga Mine and other assets from Rio Tinto for US$50 million in 2014 (Antonioli and Regan 2014). In 2022, Vulcan Mozambique, a subsidiary of JSPL, purchased Moatize Mine and its transport network for US$270 million (Vale 2021, 2022).

Indian companies have brought significant changes to the projects designed by the previous investors. Oskarsson and Lahiri-Dutt (2019) argue that since Indian mining companies abroad are not fully integrated into international supply chains or global financings, they rely on internal or domestic resources, increasing the flexibility in how they operate by adjusting to the local conditions. This flexibility is in contrast to Vale, Rio Tinto and other multinationals, who seek global financing and follow international standards and practices in their operations (see Table 1).

Previous studies have highlighted uneven employment opportunities in Tete, where qualified immigrant workers have greater access to better employment opportunities, while the less-skilled local workforce often faces exclusion and marginalisation (Mosca and Selemane 2011; Kirshner and Power 2015; Cezne and Wethal 2022). Yet, there has been little attention to new labour dynamics emerging in such workplaces through the energy transition. As more shifts in investors are expected across coal frontiers, it is crucial to understand how the labour dynamics and class relations change and explore how to ensure a decent and safe working environment for

Table 1. Key international standards and practices related to health and safety that each company claims to follow.

Company	**Vale**	**Vulcan**
International standards/ practices	ICMM Principals (Principal 5) Global Reporting Initiative (GRI) (403 Occupational Health and Safety 2018) ISO45001 (Occupational Health and Safety Management System) OECD Guidelines for Multinational Enterprises on Responsible Business Conduct Global Industry Standard on Tailings Management (GISTM)	ISO45001 (Occupational Health and Safety Management System)
Company	**Rio Tinto**	**ICVL**
International standards/ practices	ICMM Principals (Principal 5) Global Reporting Initiative (GRI) (403 Occupational Health and Safety 2018) OECD Guidelines for Multinational Enterprises on Responsible Business Conduct Global Industry Standard on Tailings Management (GISTM)	No information available

Source: Compiled by the authors from the official websites and reports of each company.

labourers. The following section analyses the three dimensions of changes observed in company–labour relationships after the shift in investors.

The consequences of the shift of lead companies for labourers and class relations

The entrance of the Indian firms, such as ICVL (replacing Rio Tinto in Benga Mine) and Vulcan (replacing Vale in Moatize Mine) in Tete has affected mineworkers in three key ways: restructuring of the composition of subcontracting companies and their workers; radical optimisation of the mining operations and labour management; and shifts in safety culture. A Mozambican former senior manager who worked in Benga Mine for over 10 years, serving both Rio Tinto and ICVL, aptly summarised these changes:

> The most important thing [for the new Indian administration] is not the quality [of service], the most important thing is not the safety, the most important thing is less money, less time. That was the first thing they [the Indian managers] shouted. … This became the norm and is still the norm today. Everything else is designed and considered along this line of thought. (Interview 08, 17 March 2023)

This statement highlights how Indian managers aim to boost coal production through operational efficiency while simultaneously reducing costs. Although his statement concerned Benga Mine, our empirical data suggest similar changes have occurred in Moatize Mine. The following subsections will show that the introduction of the new norm comes with certain costs, reshaping labour dynamics.

Restructuring of subcontracting companies and their workers

In Benga Mine, Riversdale (later Rio Tinto) initially formed an agreement with MCC Contracts,[3] an established mining equipment supplier in South Africa, as a mining contractor (World Coal 2010). The mining contractor led the day-to-day mining operation, such as extraction, loading and hauling, under the supervision of the lead investor. MCC employed around 500 direct workers, nearly 90% of whom were Mozambicans (Baloyi 2015). The withdrawal of Rio Tinto and subsequent arrival of ICVL in 2014 have restructured the composition of the subcontracting companies and workers related to the project.

For example, Susana, originally from Maputo, arrived in Tete in 2011. MCC provided her with six months of initial training and she subsequently started working as an off-highway truck operator. Both Rio Tinto and MCC prioritised training programmes for national workers (see Kirshner and Power 2015). As many domestic workers did not have skills relevant to mining operations, MCC invested in training facilities with simulators and brought in mining experts to train workers in the field (Baloyi 2015). Over time, Susana accumulated the skills to deal with different types of trucks, and her salary increased accordingly. However, when ICVL replaced Rio Tinto it decided not to renew the contract with MCC, and Susana lost her job in Benga Mine (Interview 04, 12 December 2022).

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Since ICVL's arrival, the number of Indian workers in Benga Mine has increased. After MCC, ICVL contracted a new mining contractor, BGR Mining & Infra Limited, an experienced mining operator in India. Currently, BGR employs hundreds of Mozambican and international workers, yet the ratio of Mozambican workers has notably declined. A former senior manager for Rio Tinto and ICVL said that 'Benga Mine is now full of Indians' and added that the same kind of situation may happen in Moatize Mine in the future (Interview 08, 17 March 2023). Ensuring effective production is perhaps one reason for the increased presence of Indian workers. A BGR worker stated that in recent years, the company has recruited more Indians than Mozambicans, giving as a possible reason that when Mozambican workers have funerals to attend, they request several days of leave, while Indian workers do not (Interview 07, 15 March 2023). From a management perspective, it is more convenient to have Indian workers isolated from their social networks back home to ensure smooth mining operations.

In Moatize Mine, prior to the shift of the lead company from Vale to Vulcan, Vale, Vulcan and the Mozambican government agreed that none of Vale nor Vulcan's employees would be dismissed (Interview 03, 5 November 2022). However, subcontracted workers were outside the scope of this agreement. After Vulcan took over, it began to review all the contracts Vale had signed with its subcontractors, first targeting those it deemed inefficient. Vulcan has also negotiated with other subcontractors to reduce costs. As a result, many subcontracted workers lost their jobs, including skilled expatriates or national workers, previously considered among the 'winners' in the sector (see Kirshner and Power 2015; Selemane 2016). These workers typically had better employment terms compared to others, such as higher salaries, housing support and holiday allowance.

Under Vulcan, some of the key subcontractors of the previous owners were severely affected. For instance, Vulcan revised its contract with a South African firm that maintained the heavy machinery in Moatize Mine, citing its alleged high cost. Consequently, the number of mechanics fell from over 100 to fewer than 10, and the company had to relocate its skilled workers, leading to the repatriation of South Africans and other foreigners (Interview 05, 6 March 2023).

Nevertheless, the withdrawal of old partners (subcontracting companies) has created opportunities for others. In Moatize Mine, there is a wave of small to medium-sized Mozambican companies, including some companies with Indian roots,[4] gaining new contracts or increasing their volume of business. These companies are bringing in new subcontracted workers to the mining site. Additionally, an Indian company, Tata Voltas, has operated in Moatize Mine since Vale's time, but after the entrance of Vulcan, it expanded its maintenance works (Interview 05, 6 March 2023).

In both Benga and Moatize mines, the ownership changes have altered the composition of the subcontracting companies and their workers. Many subcontracted workers, including those previously seen as occupying privileged positions, were dismissed or forced to relocate. Concurrently, the ownership changes have opened new opportunities for Mozambican and Indian subcontractors and their workers. In Benga Mine, ICVL's aim to ensure more effective production has restructured the previous class relations and ethnic dynamics, increasing the ratio of Indian workers to Mozambicans.

Radical optimisation of the mining operations and labour management

The Indian companies have also sought to radically optimise the projects to reduce operational costs. In Benga Mine, the introduction of a new norm has resulted in the deterioration of the working environment. Susana, the former MCC worker who was laid off after Rio Tinto's divestment, returned to Benga Mine in 2018 after receiving an offer from BGR. She only stayed for a short time because she saw that the working environment had significantly worsened compared to that fostered by Rio Tinto. She described it as *garimpo*, a Portuguese term connoting risky, precarious and exploitative artisanal mining activity (Udelsmann Rodrigues 2017). Susana recalled having a reduced salary without healthcare coverage, and equipment operators had to take meals inside their vehicles.

In Moatize Mine, Vulcan seeks to maximise its workforce. Previously, Vale provided one main canteen for its workers. Vulcan came up with a plan to open new canteens next to some of the extraction sites to speed up the process and ensure that workers spend more time on production (Informal conversation 01, 24 March 2023).[5] As a result of this optimisation, workers have relatively more productive time in their 12-hour shifts,[6] which creates a tighter working environment.

Vale previously carried out its core mining operation in Moatize with its own directly employed workers, except for a section operated by Portuguese company Mota Engil. Vulcan is changing this system, relying more on subcontracted companies and their equipment. Nuno, a Vulcan supervisor, stated that since its takeover Vulcan has not been recruiting new employees nor dismissing existing employees, yet there has been an increasing presence of subcontracted workers over the core mining operation (Interview 11, 30 March 2023). He explained that by outsourcing, Vulcan could save some costs in terms of buying and maintaining equipment and contracting new employees (Interview 11, 30 March 2023).

The rise of outsourcing in Moatize Mine is also linked to more effective production. João, another Vulcan supervisor, said that a new Mozambican company recently joined Vulcan's core mining operation, and only provides flexible mining equipment operators. For instance, some of the workers from this subcontracting company start working when Vulcan's workers are on their lunch break (Interview 12, 12 April 2023). João observed that these workers have relatively insecure employment compared to Vulcan's employees since the subcontracted workers (or subcontracting companies themselves) can be easily replaced if their performance is not satisfactory (Interview 12, 12 April 2023). The Indian companies' preference to contract more cost-effective companies increases the instability among subcontracting companies and their workers.

While the rise of outsourcing has created some, albeit unstable, opportunities for newcomers, more reliance on subcontracted workers may also be Vulcan's strategy to keep the mine operational. In May 2022, shortly after Vulcan took control, more than 500 of its own employees (former Vale employees) went on strike without prior notice, demanding financial compensation for the shift in employers (Reuters 2022). The movement started as a wildcat strike led by mining equipment operators and later SINTICIM, the national union for workers in civil construction, timber and mining

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industries, and the Mozambican government joined negotiations (Interview 01, 9 August 2022; Interview 02, 19 August 2022).

The dispute highlighted a lack of communication between Vulcan and its employees about the implications of the ownership shift for their existing contracts. The striking workers expected that they would end the contracts with former employer Vale (and receive financial compensation) and sign new contracts with Vulcan. However, all the employees were automatically transferred from Vale to Vulcan, in line with Mozambican labour law. After more than a week of negotiations, the strike ended, and Vulcan ensured that there would be no change in the existing contracts that the workers had signed with Vale (Interview 01, 9 August 2022). The strike caused a huge loss of profits for Vulcan. To cope with potential future strikes, Vulcan appears to have opted to include more subcontracted workers in its core mining operation. In this way, Vulcan can carry on operating during any strike while also reducing the union's bargaining power.

The Indian companies therefore have sought to radically optimise their mining projects, relying more on subcontracting companies' resources and reducing operational costs, which has led to a more precarious work environment (though changes in Moatize Mine are ongoing). Vulcan increased its reliance on subcontracted workers to boost production and to prepare for future strikes, which fragmented the labour structure and lowered mineworkers' bargaining power.

Shifts in safety culture

Since the early 2000s, with the rising influence of institutional shareholders pushing for short-term and maximum returns, referred to as shareholder activism (de los Reyes 2017), safety has become an important focus for mining companies (Musonda and Pugliese 2021; Maybee, Lilford and Hitch 2023). Musonda and Pugliese (2021) argue that mining companies nowadays prioritise safety to ensure the continuation of production as an accident potentially halts operations for hours, costing much more than the money invested in safety. Safety is also prioritised with the aim of defending the company's value and reputation. Established multinationals strictly enforce a wide range of safety rules and procedures for workers so as to avoid responsibility when an accident happens.

Among Tete's mineworkers, Moatize Mine is known for having the most rigorous safety standards, which were introduced by Vale. Vale publicly emphasised that their operations worldwide are carried out in accordance with international safety standards and practices (Table 1). In the mine, workers encounter signs related to safety everywhere: on speed limits, non-use of mobile phones, and detonation schedules. Many interviewees expressed satisfaction with Vale's safety measures and said that they largely persist under Vulcan. However, some interviewees noted changes in the safety culture, stating that attention to safety in the mine has started to decline. Although there is no official record of an increase in the number of accidents, Zitamar News reported on a series of serious accidents at Moatize Mine after the change in ownership (Zitamar News 2024). Instead of strengthening safety standards, Vulcan appears to consider safety procedures a hinderance to more effective production. An expatriate engineer who works for an equipment maintenance subcontractor explained that one of the fundamental

differences between Vale and Vulcan is that, with Vale, the maintenance team had to follow several steps to access the machines, but under Vulcan's management these procedures are being taken away to save time (Interview 10, 24 March 2023).

Similarly, a Mozambican electrician who works for a subcontracting company and supervises the maintenance of excavators noted that the safety agents appear less frequently under the new ownership, whereas before, Vale's safety agents visited their maintenance site every two to four hours to ensure the safety measures, such as proper use of personal protective equipment and locking the mining equipment during maintenance works, were being adhered to (Interview 09, 24 March 2023). The reduction in enforcement by Vulcan has raised safety concerns among subcontracted workers in Moatize Mine.

In Benga Mine, several mineworkers who worked under Rio Tinto observed that the safety culture in the mine has significantly reduced over time. One reason for this is ICVL's reliance on the lowest-cost subcontractors, which often invest less in safety. An HR manager from a Mozambican subcontractor involved in earthmoving that served MCC under Rio Tinto's management explained that after Rio Tinto's withdrawal, the company was unsuccessful in signing a new contract with ICVL. He added that ICVL's offer was too low and that his company could not maintain service quality and safety standards at this rate. He also claimed that many subcontracting companies working in Benga Mine today under ICVL would not be there under Rio Tinto's management due to a lack of professional experience and to attention to safety (Interview 06, 7 March 2023). This testimony highlights that Rio Tinto ensured that subcontracting companies followed international safety standards; however, ICVL does not require the same, which enables it to contain overall costs.

The decreasing attention to safety by Indian companies can be related to less exposure to global shareholder activism. Both Vale and Rio Tinto are listed on Western stock markets (the New York Stock Exchange and London Stock Exchange, respectively). Diversified shareholders increasingly demand that companies deal with ESG risks, including international safety standards and practices (Musonda and Pugliese 2021; Maybee, Lilford and Hitch 2023). Yet most of the shares of the Indian companies are held by domestic shareholders. While ICVL is a consortium formed by Indian state-owned companies, Vulcan's mother company, JSPL, is a private company listed on two national stock exchanges in India, and a significant portion of JSPL's shares is owned by Jindal family members and their associated companies (JSPL 2023). Both ICVL and Vulcan therefore have more autonomy in deciding the degree of safety measures to be implemented compared to their predecessors.

This section has shown that shifts in ownership have had an impact on the safety culture introduced by the previous multinationals. In Moatize Mine, some mineworkers have observed signs of erosion in the safety culture under Vulcan's management. In Benga Mine, while Rio Tinto ensured that subcontracting companies complied with international safety standards, ICVL prioritises cost-effectiveness over safety, resulting in a general decline in safety.

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Conclusion

This article has explored often-neglected changing labour dynamics taking place in the coal mining region in Tete, Mozambique, that is still actively under development. It has analysed these changes through reviewing the neoliberalisation of mining, which has deepened the fragmentation of the working class, and the recent global decarbonisation process, which led to shifts in coal-extracting companies from established multinationals to new companies from emerging economies, especially India. Drawing on fieldwork on the effects of the entrance of Indian companies in two mines in Tete province, the article has shown that the changing coal labour dynamics can be encapsulated in three distinct but connected aspects: restructuring of the composition of subcontracting companies and their workers; radical optimisation of the mining operations and labour management; and shifts in safety culture. The new coal investors focus on effective production and profit-making and are less concerned about workers' wellbeing and safety, as they are less tied to external conditions, such as strictly following international standards. This has resulted in a general decline in the working environment. The coal workers have no choice but to accept an even more precarious and unsafe working environment due to the lack of alternatives.

This study has contributed to extending our understanding of changing labour dynamics resulting from the shifting coal investors in Africa under the current global push towards decarbonisation, on the one hand, and the persistent demands for coal on the other. We expect to see more variations in the nexus between shifting investors and changing labour dynamics across coal-producing countries, further reconfiguring the existing ethnic structures and fragmented class relations. In particular, the increasing presence of emerging investors with less alignment with the decarbonisation agenda and international standards (see Oskarsson and Lahiri-Dutt 2019) and their impacts on workers merit careful examination.

The changes in labour dynamics and class relations amid the growing impacts of climate change raise further questions about how to achieve sustainable fuels and healthier, climate-resilient living environments through the energy transition. The energy transition process is reshaping the global coal industry, but the coal economy is likely to persist longer than we expected. Meanwhile, uneven decarbonisation efforts and coal agendas across different parts of the world are deepening the existing challenges to ensuring a decent and safe working environment for labourers. Thus, it is imperative to follow the implications of climate change and the decarbonisation process not only for coal workers but also for broader societal transformations in these regions.

Notes

1. Aside from being an ICMM member company, private entities based in the global North hold significant shares of the company. See Vale (n.d.).
2. All the interviewees' names have been altered to ensure their anonymity.

3. In Tete, the company was also known as Eqstra, the parent company of MCC.
4. While new Indians are arriving in Tete with coal industry connections, there is a local Indian community owning various businesses with links to the historical Indian diaspora in Mozambique.
5. Individuals working in Moatize Mine confirm that several new canteens are functional.
6. The labour law stipulates that normal working hours are eight hours per day; however, 12 working hours is allowed with a collective labour agreement.

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Interviews

Interview 01, 9 August 2022: representative of SINTICIM Tete
Interview 02, 19 August 2022: member of Vulcan's labour union committee
Interview 03, 5 November 2022: senior officer of the coal industry
Interview 04, 12 December 2022: Susana, former MCC worker
Interview 05, 6 March 2023: South African company's supply/commercial manager
Interview 06, 7 March 2023: subcontracting company's HR manager
Interview 07, 15 March 2023: BGR worker
Interview 08, 17 March 2023: Rio Tinto/ICVL former senior manager
Interview 09, 24 March 2023: subcontracting company's electrician
Interview 10, 24 March 2023: subcontracting company's expatriate engineer
Interview 11, 30 March 2023: Nuno, Vulcan supervisor
Interview 12, 12 April 2023: João, Vulcan supervisor
Informal conversation 01, 24 March 2023: subcontracting company's employee