



## RESEARCH ARTICLE

# Public disclosure of mine closures by listed South African mining companies

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## Abstract

The demand for transparency in the mining sector has increased since the 1980s. Our study focused on the public reporting of four South African mining corporations and their disclosures on mine closure. South Africa was identified based on its history of mine abandonment. We found that reporting on mainstream environmental and financial matters, companies disclose little about the social aspects of mine closure. External reporting norms have evolved, with a widening scope of reporting themes presented in strategically parsimonious language. Reporting themes speak to where companies, and transparency initiatives, receive greatest external interest and much of the content in company sustainability reports appear to service this demand. This pattern is manifestly challenging for the social aspects of mine closure, where reporting is minimal and reveals little about the timing of proposed changes to the mine lifecycle, the anticipated societal effects, and how the company will address these.

## KEYWORDS

coal, environmental policy, mine abandonment, stakeholder engagement, sustainability, sustainable development, transparency

## 1 | INTRODUCTION

As more large-scale mines reach the end of their productive life, mine closures are becoming a common concern worldwide. The closure of these industrial installations poses challenges for states, companies, and mine-affected communities. Governments rarely have the technical capability or confidence to establish and enforce stringent regulatory regimes for mine closure. Companies frequently operate under regulatory regimes where closure provisions are unclear or incomplete. Communities that reside in mining areas face rapidly diminished economies and uncertain futures. Social dimensions of mining like the interdependencies of mining communities and mining companies, land use, environmental aspects, employment, income levels, inclusion of stakeholders, while shown to be critical throughout the mining life cycle, are poorly represented in regulation, research, or in company disclosures about mine closure.

Until the late 1970s, corporate reporting focussed primarily on financial matters. By the late 1980s, demand for reporting of environmental and social issues began to increase as a form of public accountability. This period saw the introduction of behavioural codes and the suggestion that large industrial sectors could be transformed (Alonso-Almeida et al., 2014). Since the 1990s, companies have supported the market for 'sustainability reports,' or 'social and environmental reports' by emphasising the relevance of various social and environmental indexes to their activities. Institutional guidance began to emerge to address issues of inconsistency in non-financial disclosures. The Global Reporting Initiative (GRI) was established with the support of the United Nations Environment Program (UNEP), in 1998. The GRI's mission is to enable organisations to be transparent, and to take responsibility for their impacts on people and the environment. The GRI is arguably the world's most widely used standard for disclosing environmental, social and economic aspects of different types of



corporate activity (Alonso-Almeida et al., 2014). However, application between sectors has been uneven and quality concerns about reporting in the mining industry remain valid (Fonseca, 2010). A recent UN report notes that sustainable reporting in the mining industry “is currently not meeting the expectations of interested stakeholders, notably communities affected by mining operations and investors (United Nations Environmental Programme, 2020, p. 10).

This paper brings together these threads: increasing mine closures, limited information about the social aspects of mine closure, and public reporting on this issue. The study focuses on South Africa given its global prominence as an extractives economy and mining's assumed role in supporting national development goals. South Africa has a long and geographically dispersed history of mine abandonment, with a large number of mine projected to close in the next decade. Mining companies frequently move economically exhausted assets into care and maintenance or divest as a means to avoid closure costs. Academic literature suggests that neither regulatory requirements nor disclosure norms are challenging or changing industry practise. In this sense, public disclosure is failing to transform industry practise. In this article, we investigate large mining companies responses to external transparency demands for reporting on the social aspects of mine closures.

Based on a review of four large mining corporations' public reporting activities, our findings reveal inconsistencies between the international transparency norms, and national level practises of public disclosure. We found that apart from reporting on mainstream environmental and financial matters, companies disclose little about the social aspects of mine closure. We argue that a ‘self-selective’ approach to corporate reporting has minimal value for local communities. Companies' benign disclosures merely function to distract from difficult issues. This does not build trust, and over time may instead build scepticism—particularly against South Africa's mine closure legacy. For local communities, sustainability reports offer limited insight into the social and economic effects that may be left in mining's wake.

## 2 | THE LITERATURE: TRANSPARENCY, DISCLOSURE AND MINE CLOSURE

### 2.1 | Disclosure and transparency

Although greater transparency is firmly rooted in liberal thinking, industrial accidents have been a central motivation for public disclosure regulations since the 1970s. Governments responded to industrial ‘accidents’ through safety and transparency regulations. These transparency regulations required the business to publicly disclose information about their processes, goods, services and the associated risks. Weil (2006, p. 155) defines regulatory transparency as the “mandatory disclosure of structured factual information by private or public institutions in order to advance a clear regulatory goal.” Under this definition, transparency or information sharing is seen as a public good. The logic is as follows: the public can hold corporations and governments to account if they have access to adequate information. On this reasoning, improved information

availability should contribute to behaviour change among users, government and firms, and generate a broader social benefit.

Public demand for industry information is not new. Environment and safety risks and the need to address corruption have been driving factors (Coetzee & van Staden, 2011; Owen et al., 2020). The Extractive Industries Transparency Initiative (EITI) is one example of a global drive toward transparency. According to Haufler, 2010, p. 53) there is an implied assumption that. Greater transparency will lead to improved accountability, improved management of natural resources, lower levels of corruption and an empowered citizenry who will “demand more equitable and sustainable development.” At the same time, the industry's stated commitments to sustainability have ushered in expectations for greater transparency (Frost et al., 2005). More recently, following a sequence of catastrophic tailings disasters, efforts were made to formalise a new Global Industry Standard on Tailings Management (GTR, 2020) promoting greater transparency over the construction and operation of these facilities. Reflecting on how these higher transparency goals will be achieved, Kemp et al. (2020:1) note that “the socialisation of transparency norms is a highly complex, contingent and ultimately fragile endeavour.” However, transparency and disclosure are not a silver bullet for dealing with the challenges of mine closure in the mining industry.

Providing information and making decisions based on that information is less of an automatic response than what transparency norms assume. Researchers have provided mixed evidence on the success of disclosure regulations (Baraibar-Diez et al., 2016; Fung et al., 2007). One of the main reasons is that societies and decision-makers do not always understand complex cause and effect relationships. Fung et al. (2007) refer to ‘cause and effect’ as an action cycle in which a chain of steps enhance transparency (see also Alonso-Almeida et al., 2014). Yet, several factors can break the chain of steps: the lack of full disclosure, the inability of users to understand the implications and the lack of action related to the information (Weil et al., 2006).

A second reason why transparency mechanisms do not always have the full effect lies in the way information users use the disclosed data (Jasanoff, 1988). Weil et al. (2006) refer to this as “user embeddedness.” User embeddedness refers to the ability of the user to respond to the available information. Various obstacles occur in the transparency action cycle: people do not use the information; it is not good enough and/or the disclosures do not provide the information promptly. Moreover, the modality of communication can affect the end consumption of disclosures, such that recipients simply do not understand what is reported (Garcia-Torea et al., 2020). These obstacles affect the chain of steps negatively. Disclosure embeddedness refers to how the behaviour of users forces decision-makers to change their decisions and actions. Thirdly, systemic issues can impact negatively on the chain of steps. Information is unevenly available, and business and governments are driven to suppress information rather than incentivised to make it available (Gupta, 2008; Haufler, 2010). Finally, Gupta (2008) has pointed to the dangers of too much information and risks caused by overload or information dumping where consumers are unable to discern what is valuable from the general mass of reporting.

## 2.2 | Mine closure: The global landscape

Historically, mining companies closed their mines by abandoning their projects. This approach has generated severe environmental issues given the technical and financial resources required to manage pit voids and waste facilities over the long-term. Consequently, environmental regulations have become more stringent over the last three decades. Nonetheless, governments have given little regard to the social aspects of mine closure (Vivoda et al., 2019). Bainton and Holcombe (2018:368) define the social aspects of mine closure as ‘the socio-economic, political, cultural and institutional impacts that arise at the end of the project lifecycle; the planning and management processes that are required to mitigate these impacts; and the post-mining future.’ Despite improvements in environmental regulation, the social aspects have not become a mainstream feature of mining regulation worldwide, a factor that threatens not just the industry’s claims to sustainability, but sustainability itself. Below we highlight five themes associated with the emerging literature on the social aspects of mine closure.

First, a vast number of mining projects are not formally relinquished. The dominant pattern is for mining companies to either sell their assets to smaller firms or place their mines indefinitely in ‘care and maintenance’ (Nehring & Cheng, 2016; Vivoda et al., 2019). Smaller firms prolong the life of mines by slowing production, thus avoiding the capital required to finance closure liabilities. Moving an operation into ‘care and maintenance’ can be understood as closure avoidance pathway for the developer. While ‘care and maintenance’ is formally distinct from closure, the large-scale demobilisation of the asset will often lead to job losses and socio-economic effects similar to closure. ‘Care and maintenance’ also leaves the possibility for developers to re-open operations if commodity prices rise.

Second, the industry’s permitting orientation is strongly biased toward start-up with less emphasis given to decommissioning, closure, and lease relinquishment (Owen & Kemp, 2018). At start-up, developers are looking for stable working terms with a clear show of basic support from host communities. This follows project financing norms where capital is available at construction or for major works and

**TABLE 1** Social aspects of mine closure

Social aspect	Indicative elements
Economic	Local economic activity (diversity and dependence) Household income Local living standards
Business	Local business development opportunities in the mining Business opportunities in other sections
Employment	Local employment opportunities in the mining Local employment opportunities in other sectors Local employment stability/volatility
Security, education and training infrastructure	Social order and safety (e.g. tensions, crime and violence) Local skills development in mining and other sectors Access to quality education and training Local transport (e.g., public buses, roads and airports) Critical infrastructure (food supply, power supply, water supply, telecommunications)
Amenity	Local aesthetic and recreational resources (e.g. heritage sites, parks, and recreation areas, communal areas) Local culture, arts and sports (including facilities)
Livelihoods	Local livelihoods (e.g. access to land, food, water and shelter that affects livelihoods)
Land	Local land access, ownership and use Recognition of traditional, customary ownership
Housing and Health	Local housing quality, availability and affordability Community health and wellbeing Access to quality health and social services
Environment	Environmental aspects that affect social conditions (e.g., quality of air, water, land, ecosystem)
Demography	Local population dynamics (e.g., growth/decline, migration, ageing, gender balance)
Participation	Stakeholder participation in closure planning, and closure and post-closure processes (including decision-making)
Inclusion	Inclusive stakeholder engagement, including vulnerable and otherwise marginalised groups (e.g., Indigenous peoples, women, ethnic minorities, disabled, elderly, young) in closure planning, and closure and post-closure processes (including decision-making)
Social (general)	General socio-economic considerations Social considerations in financial assurance mechanisms

Note: Source: Vivoda et al., 2019, p. 8.



expansions, but exceedingly difficult at the back end of the mine life-cycle where investment cannot be recouped through further mining and processing (Peck & Sinding, 2009).

Third, the danger is that satisfying relinquishment criteria will allow developers to sever their obligations to the state, or local communities before all risks have presented themselves. In many instances, the social implications of mine closure will surface only after the asset has been closed, and the developer is no longer present or active. Many South African mining companies promote homeownership programmes. Yet, mine closure has left former mineworkers with housing debt and housing assets in a place where economic activity is limited (Marais, 2013).

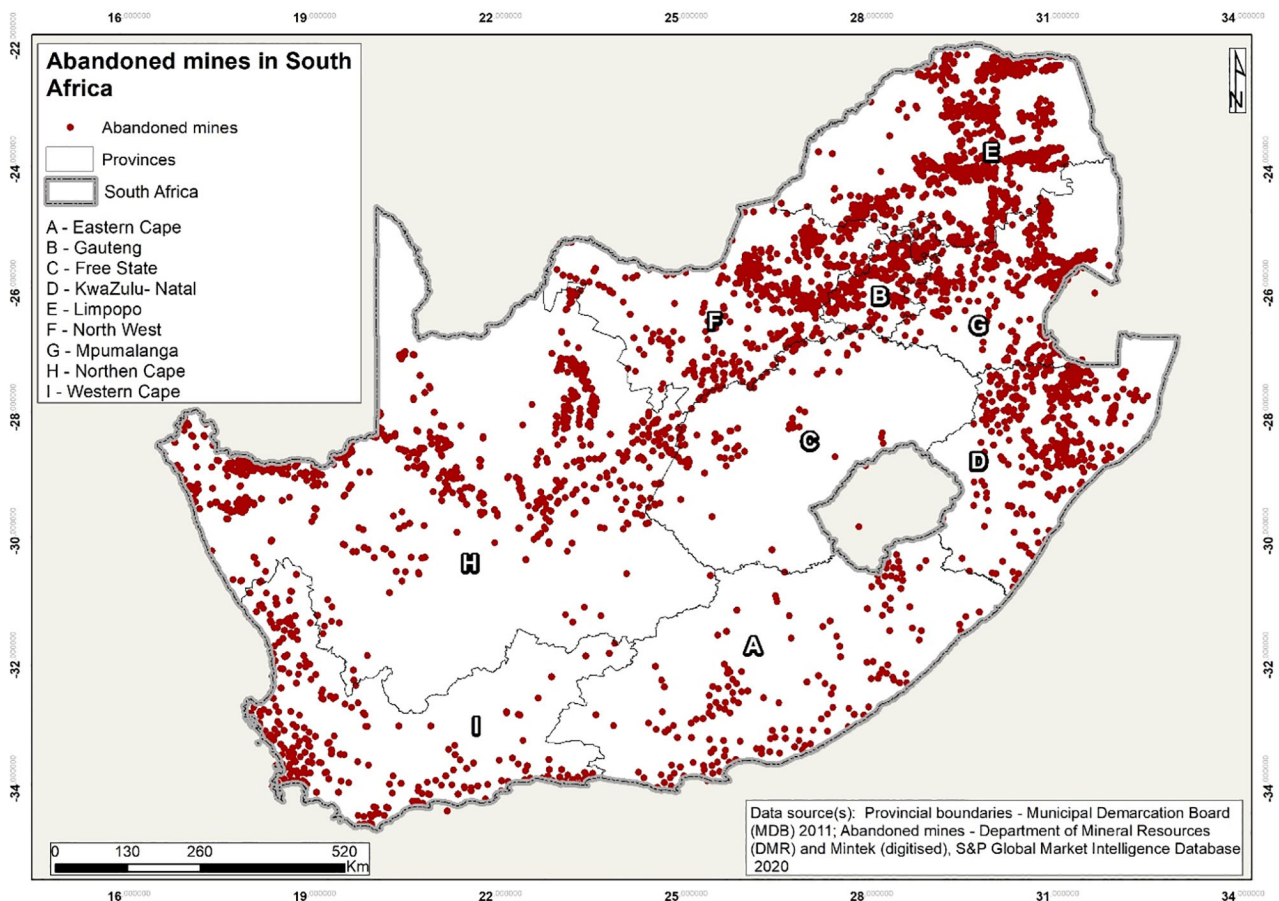
Fourth, Vivoda et al. (2019) provide a list of 14 social aspects linked to 30 closure elements (see Table 1). The 14 aspects that could be applied locally or regionally are: the economy, business, employment, security education and training infrastructure, amenities, livelihoods, land, housing, health, the environment, demography, participation, inclusion, and general social aspects. Although this list is not exhaustive, it does provide an entry point for considering the social complexities associated with mine closure. Central to the problem is that mining creates dependencies between the mining companies and local communities. Closing a mine breaks these dependencies and could leave mining communities in disarray. More recent

literature emphasises the importance of considering the consequences of mine closure far beyond the formal closure process (United Nations Environmental Programme, 2020).

Finally, the actual cost of mine closure should include the cost of meeting obligations relating to the social aspects. Including such cost 'will require a more complete accounting of the distribution of the costs and benefits arising during different phases of the mine life-cycle.' (Bainton & Holcombe, 2018, p. 370). Presently, sustainability reporting from mining companies does not include financial disclosures about the composition or accumulation of these costs.

### 2.3 | Mine closure in South Africa

South Africa has a long and geographically dispersed history of mine abandonment. Up to 1991, mines could abandon their operations once they could not mine profitably (see Figure 1 for abandoned mines). South Africa has close to 6000 derelict and ownerless mines (Auditor General, 2009) and a large number of mines under extended maintenance while awaiting closure certification (Miralas et al., 2014; Watson & Olalde, 2019). The Minerals Act of 1991 changed this when it required mining companies to develop an environmental management programme, a rehabilitation plan and stipulate post-mining provisions



**FIGURE 1** Abandoned mines in South Africa [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

associated with environmental liabilities (Swart, 2003). The Mineral and Petroleum Development Act (MPRDA) of 2002 further reinforced closure legislation (Watson & Olalde, 2019). Despite the existence of the MPRDA (Republic of South Africa, 2002), mine closure legislation is part of environmental, water and pollution legislation and no legislation or regulation exist that exclusively focuses on mine closure (Kung et al., 2020). This legal framework complicates rather than clarifies mine closure procedures. The competing legislative environment and the involvement of numerous government departments fragments responsibilities and drives varied interpretations of legislation (Watson & Olalde, 2019). Furthermore, the appropriate skills required to regulate mine closure are often lacking (Miralas et al., 2014; Van Druuten, 2017; Watson & Olalde, 2019). The complex legal context reinforces the idea of mine closure as exclusively an environmental consideration (in terms of water, rehabilitation and pollution), rather than also including social and local economic aspects.

One consequence of the problems mentioned above is the slow process of mine closure in South Africa. Table 2 shows the number of mine closure certificates granted and issued with a closure certificate between 2012–2015. Table 2 also shows very few closure certificates were issued in Gauteng and Mpumalanga during this period, with 15 and 10 closures, respectively. Moreover, while the data obtained had some information on mine closure applications lodged, it only included information on mine closure applications for four provinces, namely: Gauteng (33), KwaZulu-Natal (52), Limpopo (228) and the Eastern Cape (30). Incomplete data accompanied the information on mine closure applications in the Northern Cape, with records for the Springbok and Kimberly offices. The findings confirm the data from Watson and Olalde (2019).

Despite submitting a Promotion of Access to Information Act (PAIA) request, Watson and Olalde (2019) only received information on closure applications for the provinces mentioned earlier and partial records for the Northern Cape, only obtaining records from the Springbok office. Figure 2 locates expected mine closures in South Africa in the next 10 years.

**TABLE 2** Mine closure certificates issued across South Africa, 2012–2015

Province	Mine closure certificates issued
Gauteng	15
Mpumalanga	10
KwaZulu-Natal	58
Limpopo	145
Northern Cape (Springbok and Kimberly)	143
Eastern Cape	41
Western Cape	35
Free State	206
North West	87
Total known	740

Note: Sources: OpenAfrica, 2017.

### 3 | RESEARCH METHOD

We selected the four largest mining companies listed on the Johannesburg Stock Exchange per subsector: one each from platinum (Anglo-American Platinum (Amplats), coal (Glencore), gold (Sibanye Stillwater (Sibanye) and metals (BHP Billiton) industries. The largest companies were selected because these firms are reported to have better disclosure practises (Baboukardos & Rimmel, 2016; Barth et al., 2017; Zhou et al., 2017). Further, larger companies typically include non-financial information, such as social and environmental aspects, to a greater extent than smaller companies. These companies also include international operations, and disclosures include reporting on these international operations and possible mine closure. It is thus more likely one will find empirical evidence on the socio-economic impact of mine closures in the reports of larger companies than their smaller peers. These four firms are also tier one members of the International Council of Mining and Metals (ICMM), with obligations for public disclosure. The study focused specifically on collecting published reports for the period 2015–2018. These reports included: annual reports, integrated reports, audited annual reports, supplementary reports and sustainability reports for the sampled companies.

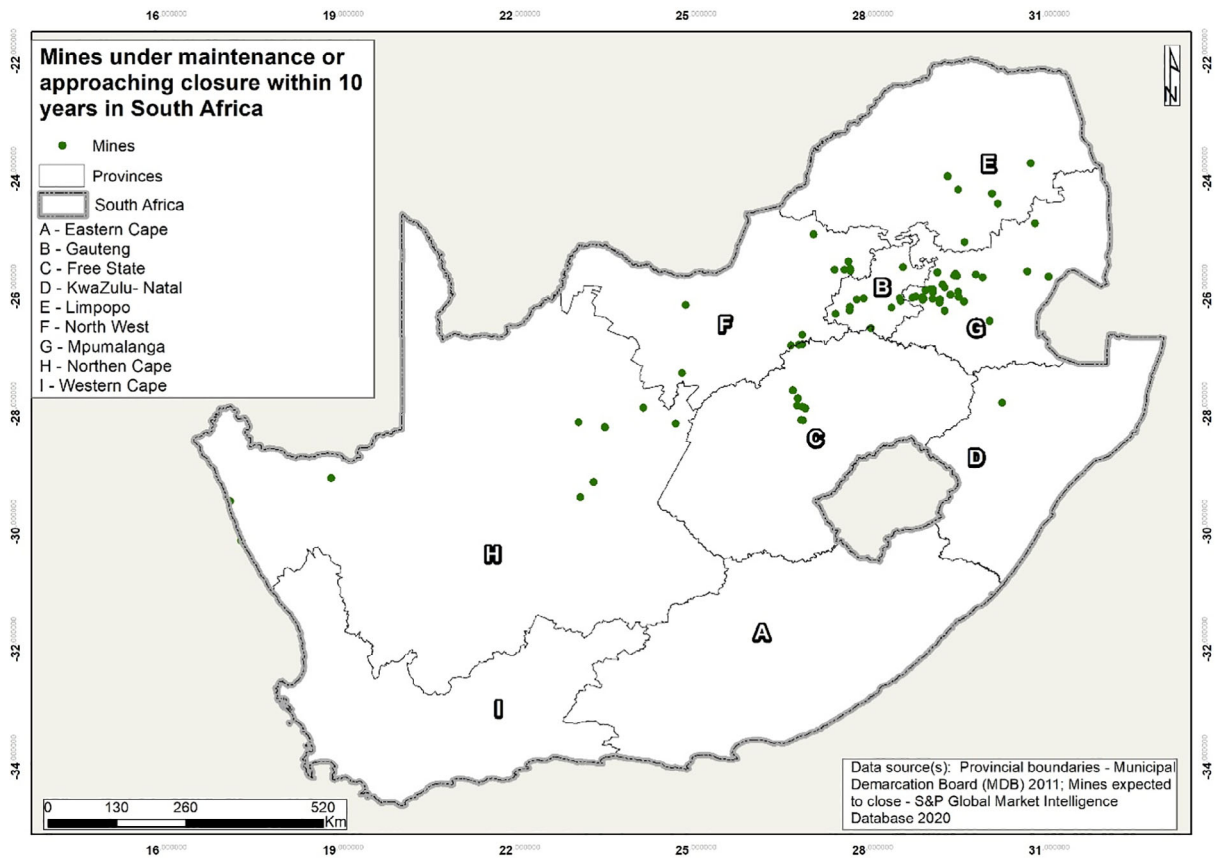
A two-phase content analysis was conducted. In the first phase, we generated two codes: socio-economic aspects and mine closure and analysed the reports using *Atlas.ti*. These codes were used to determine the frequency of terminology in the different reports. The second analytic phase involved a detailed analysis of the reports to identify the content included in the reports on socio-economic aspects of mine closure. Two challenges arose with the analysis of the reports. Firstly, companies use different terminologies to describe a similar concept, for example, Anglo-American uses the term Environmental restoration, BHP, Glencore and Sibanye use Environmental rehabilitation. Secondly, companies disclosed information about social aspects, more specifically those relating to mine closures, in different reports. This necessitated the analysis of annual reports, integrated reports, audited annual reports, supplementary reports and sustainability reports for the sampled companies to indemnify the related information.

### 4 | FINDINGS AND DISCUSSION

#### 4.1 | Planned and actual closing of mining operations

All four mining companies reported information on the actual and planned closure of mining and related activities (see Table 3). In examining company reports, we distinguished between actual closures, the intention to close and the extension or postponement of closure dates.

In at least one of the reports there was ambiguity about what closure means. In their 2015 and 2016 reports, Amplats reported the successful closure of a section of their Union mine, the Ivan tailings plant and the closure of two shafts at the Bokoni mines, reducing its



**FIGURE 2** Mines under maintenance or approaching closure in the next 10 years [Colour figure can be viewed at wileyonlinelibrary.com]

Actual or planned closure (n = number of operations planned or closed)	2015	2016	2017	2018
Anglo-American Platinum (Amplats)	4	3	0	3
BHP Billiton	3	1	0	0
Glencore	1	1	1	7
Sibanye-stillwater	1	2	3	3

**TABLE 3** Disclosure of number of actual or planned mine closure 2015–2018

South African mining workforce by one-third. In this same period, Amplats also claimed that they placed their Ivan tailings plant into ‘care and maintenance.’ Contrary to the statement indicating that the Bokoni mines were closed in 2015, Amplats later claimed in 2017 and 2018 that the mines had been placed into ‘care and maintenance.’ In their supplementary report, Ampalts mentions the existence of closure plans for the Bafokeng Rasimone Platinum mine in 2018 and 2019 similar plans for Mogalakwena and Amendelbult. Details on the closure plans or where to obtain access to these reports were absent from the disclosures.

BHP’s reporting, by comparison, is more explicit. In 2015 the company reported that BHP’s Crinum operations (Queensland Australia) were to cease operations in the first quarter of 2016 and in 2016 BHP placed the mine under ‘care and maintenance.’ In 2016, BHP confirmed the termination of the Crinum mining operations and the subsequent divestment of the mine to the Sojitz Corporation for

A\$100 million in 2018. The BHP 2015 reports also mentions the 50-year extension of the planned closure of a mining operation in Pampa Norte (Chile) until 2075. The reports mentioned restructuring and downscaling in addition to ultimate closure.

Similar to BHP, Glencore distinguished between mine closures and assets placed into ‘care and maintenance.’ In 2015, Glencore disclosed the downscaling of production in their zinc assets relating to declining demand from the Chinese market, noting an increased likelihood that some of the company’s zinc mines might close. Glencore reported placing the Eland Mine (South Africa) as well as the Ravensworth underground coal operations (New South Wales) into ‘care and maintenance.’ In 2016 Glencore disclosed its plan to close the United States (US) alumina operations, but failed to specify whether the operations would be fully closed and rehabilitated or simply placed into temporary ‘care and maintenance.’ In 2017 and 2018 Glencore reported that five mining operations were approaching the

end of their economic life. Here the reporting is confined to the mandatory disclosure of decommissioning, rehabilitation and restoration costs required by legislation.

Sibanye's reporting is comparable to that of BHP and Glencore. Sibanye reports placing the Cooke four mine (South Africa) into 'care and maintenance' since 2016. In 2017 Sibanye disclosed the risk of closing the Beatrix mine (South Africa) and the closure of the uranium processing plant at the Ezulwini asset (South Africa) in 2017. In 2018 Sibanye added disclosures related to the closure of the Stillwater mine tailings storage facility. Similar to the three other companies reviewed in our study, the reports from Sibanye contain no detail about the closure plans or how to obtain access to these reports.

The pattern of reporting across these companies highlights the frequency in which 'care and maintenance' is used. We surmise that this is a response to changing demand in the international market as well as the inevitable decline in economically available ore. Whether companies are moving these economically exhausted assets into care and maintenance as a means to avoid rehabilitation and relinquishment costs should be tested. Our review found few mentions of closure whereby the company was actively pursuing a fully-funded program of rehabilitation to relinquish a mining asset. Moreover, the various reports contain few details about the communities that are either impacted or surround the mining footprint area. The findings show that some reports include a general discussion on mine closure management processes and the companies efforts to engage stakeholders, but these were universally upside depictions aimed at

positively shaping investor impressions (Beretta et al., 2019; Casonata et al., 2019; Mio et al., 2016).

## 4.2 | Technical aspects of closure disclosure

In line with findings by Sturdy and Cronje (2017), the four companies disclose information consistent with those prescribed by legislation. That is, the substance generally relates to environmental requirements or financial reporting (Alonso-Almeida et al., 2014). These disclosures include the changes in the financial obligation associated with environmental rehabilitation, remediation and restoration. Table 4 summarises the information disclosed by each company in either the financial statements or the Integrated Reports associated with the financial obligations of mine closures.

Regarding their respective financial obligations, BHP, Glencore and Sibanye base the extent of their commitment to potential activities needed for the removal of infrastructure and rehabilitation of the environment as well as costs related to future environmental restoration activities. These costs depend on regulatory frameworks in the respective countries of operation. Moreover, these costs are linked to the end-of-mine-life and discounted at a real discount rate, while taking the timing of cash flows of ultimate closure into consideration. According to De Koker (2020:50), Glencore disclosed only 36% of the required information about their financial liability related to mine closure between 2016 and 2018.

**TABLE 4** Provision for decommissioning and restoration<sup>a</sup> costs

Company	Year	Amount	Notes reference in financial statements	Critical judgements and assumptions made					
				Extent of activities	Costs	Discount rate	Timing of cash flow	Regulatory framework	Determined by the end of life
Amplats (US\$ million)	2016 <sup>b</sup>	54	17. Disposal of Rustenburg Mine						
	2017 <sup>c</sup>	460	29. Environmental obligations					✓	✓
	2018 <sup>d</sup>	214	28. Environmental obligations				✓	✓	✓
BHP (US\$ million)	2016	6502	13. Closure and rehabilitation provisions	✓	✓	✓	✓		✓
	2017	6738	13. Closure and rehabilitation provisions	✓	✓	✓	✓		✓
	2018	6330	13. Closure and rehabilitation provisions	✓	✓	✓	✓		✓
Glencore (US\$ million)	2016	3194	20. Provisions	✓	✓	✓	✓	✓	✓
	2017	4180	21. Provisions	✓	✓	✓	✓	✓	✓
	2018	4457	22. Provision	✓	✓	✓	✓	✓	✓
Sibanye (US\$ million)	2016 <sup>a</sup>	159	13. Environmental rehabilitation obligation		✓		✓	✓	
	2017 <sup>b</sup>	129	13. Environmental rehabilitation obligation		✓	✓	✓	✓	✓
	2018 <sup>c</sup>	149	17. Environmental rehabilitation obligation		✓	✓	✓	✓	✓

Note: Sources: Anglo-American Platinum Limited, 2016; Anglo-American Platinum Limited, 2017; Anglo-American Platinum Limited, 2018a; BHP Billiton, 2016; BHP Billiton, 2017a; BHP Billiton, 2018; Glencore, 2016; Glencore, 2017; Glencore, 2018; Sibanye Stilwater Limited, 2016; Sibanye Stilwater Limited, 2017; Sibanye Stilwater Limited, 2018b.

<sup>a</sup>Anglo-American uses the term Environmental restoration, BHP, Glencore and Sibanye use Environmental rehabilitation.

<sup>b</sup>Converted from SA Rand to US Dollar using the exchange rate at the financial year-end of company on 31 December 2016 of \$1 = R13.7119.

<sup>c</sup>Converted from SA Rand to US Dollar using the exchange rate at the financial year-end of company on 31 December 2017 of \$1 = R12.3026.

<sup>d</sup>Converted from SA Rand to US Dollar using the exchange rate at the financial year-end of company on 31 December 2018 of \$1 = R14.4963.



#### 4.3 | Disclosing socio-economic aspects

Two problems exist with disclosing socio-economic aspects. First, in contrast to the detailed disclosure of the legal aspects of mine closure, reporting on the social aspects of mine closure lack basic details. Second, where companies do refer to socio-economic issues in their reporting, this information is seldom about mine closure. We focus on existing reports and the small number of references they contain to the social aspects of mine closure. Below we provide an overview of the key themes associated with disclosing socio-economic aspects associated with mining. Across the four companies, the term “socio-economic” was used 218 times over the 4 years, suggesting that the companies consider the theme relevant to their activities and their disclosure commitments.

Gender equality and community ownership are two other prominent social themes. Both Amplats and Sibanye address economic empowerment by Broad-Based Black Economic Empowerment (BBBEE) programs where local communities become co-owners in the mining operations. Although participation in the BBBEE programs provides access to economic activities, the impact of mine closures on their interests are not reported. These programmes depend on the continuation of mine operations. We found no analysis linking mine closure and the implications for target groups. These examples confirm the earlier discussion in which we highlighted the ‘front-end’ approach to project development by the industry.

By contrast, the majority of BHP Billiton's reporting on socio-economic issues relates to the 2015 Samarco Dam collapse in Brazil and the resulting 19 deaths. BHP's reports focus on the rebuilding of schools, housing, health centres, religious buildings, squares and bridges between 2016 and 2018. Under the sub-themes building human capacity and ensuring social inclusion, BHP reported 200,000 students participating in community projects, awarding 600 scholarships and improving healthcare and job-related training in 2017. BHP also states they support local, regional and national economies by “paying taxes and royalties, and we seek to develop infrastructure that benefits entire communities” in addition to making one-off donations (BHP Billiton, 2017a, p. 4).

Sibanye acknowledges the socio-economic problems in their communities by listing the major issues of unemployment, limited job mobility, and decline in economic activities, alcohol and substance abuse as well as the level of depression in their communities. Sibanye's reporting promotes the company as investing in alternative industries, alternative skills training, psychological counselling, the establishment of agriculture infrastructure and the development of local small-and medium enterprises involved in agriculture. Their involvement in the agriculture sector refers to the Bokamoso Ba Rona agricultural-industrial initiative. The company claims that an innovative approach to socio-economic closure is necessary, and it intends to promote employment in the labour-intensive agricultural sector to facilitate sustainable socio-economic development (Sibanye Stilwater Limited, 2018a).

#### 4.4 | Disclosing socio-economic aspects associated with mine closure

Most of the reporting on socio-economic issues relates to programs employed at existing operations. This section discusses the small number of cases where the reports refer explicitly to mine closure. We coded 91 instances in which the reports used the words ‘closure plan/s’ or ‘closure planning.’ Then we coded nine themes for the 91 uses of these words and allocated 102 cases among these themes (see Table 5).

Table 5 shows that (1) the availability of plans and (2) integrating closure into the business cycles were the most prominent themes. From this profile, five aspects require further consideration.

First, there is evidence of substantial investment in economic diversification for mining regions. The Amplats report, for example, notes the following:

‘This initiative aims to collaborate with other partners to facilitate and catalyse cross-sectoral socio-economic development in the Limpopo region, while diversifying local economies away from mining to ensure their long-term sustainability’ (Anglo-American Platinum Limited, 2018b, p. 61)

The future challenge is to see whether Amplats will be able to deliver on this initiative. One concern is that an over-emphasis on economic diversification can divert attention away from dealing with the immediate reality of mine closure. Furthermore, there is a risk that local stakeholders might understand economic diversification as an effort at engaging more community-based entrepreneurs in the mining value chain at a time when the economic reach of the operation is shrinking.

Secondly, despite the nine references to socio-economic aspects of mine closure, further clarity is needed on what the expected social consequences of mine closure will be. In an exception to this point, one of the reports by Sibanye states that in terms of mine closure:

**TABLE 5** Mine closure themes ranked by the appearance in reports

Themes	Number of cases
Closure plan contents/need for/availability of	29
Integrated into life cycle planning or making the business case for mine closure planning	23
Non-specific	15
Rehabilitation/environment	12
Financial liabilities	10
Socio-economic issues associated with the closure	9
Using a toolbox for closure	2
Minimising closure legacies	1
Infrastructure consequences of mine closure	1
Total	102



'They will take into account likely social impacts of closure such as unemployment, limited job mobility owing to a lack of skills diversity among retrenched employees, a decline in economic activity, despair, alcohol and substance abuse, depression and suicide, among others.' (Sibanye Stilwater Limited, 2017, p. 104)

The way these reports disclose on the social aspects of closure seldom consider the complex nature of social aspects of mine closure outlined earlier. While this quote from Sibanye suggests a familiarity with some of the adverse effects, there is no elaboration on the causes and linkages with mine closure.

Thirdly, despite some evidence of engagement with local institutions, the reports do not provide live references where interested parties can access detailed information for themselves. For example, Sibanye reports that the company has engaged with the Rustenburg Local Municipality noting that the company would feed the information 'into our regional social closure plans and into projects to be included in our SLPs' (Sibanye Stilwater Limited, 2018a, p. 124). The quote indicates that the mining company is actively working with local stakeholders on closure issues. Public access to this information is essential for testing the process elements underpinning company plans, and for clarifying overarching goals and objectives. The disclosure of these elements is an essential step to account for the complex and contingent effects of the closure.

Another example is Amplats reference to Anglo-American's socio-economic assessment toolbox (SEAT). According to Amplats, using the toolbox allows Amplats to 'engage more effectively, accountably and transparently' with local communities (Anglo-American Platinum Limited, 2018b, p. 41). Although Amplats reports using a pre-defined instrument to guide its practise, information about the method of analysis, the key findings of its assessment, and its future approach to resourcing are not provided.

Fourth, there is an acknowledgement that economic decline will occur, but little explanation as to what decline means in substantive terms. Mining companies routinely refer to developing a 'common vision,' 'finding 'mutual benefit,' generating 'socio-economic solutions' for mine closure, or 'leaving a positive legacy.' Consider the following Sibanye Stilwater:

We will focus on education infrastructure, economic diversification through agriculture, and CSI [corporate social investment] in 2019 to facilitate and catalyse alternative economic activities aimed at skills development, job creation and food security—and thus ensure meaningful social closure beyond mining. (Sibanye-Stillwater Limited, 2018a, p. 129)

Anglo American likewise aspires to leave a positive legacy:

By using spatial planning and analysis and working with partners and stakeholders in each region, we will

identify and deliver long-term development projects that benefit the communities where we operate and leave a positive legacy long after mine closure. We want to transform the way our stakeholders—from communities to customers and employees—experience our business. (Anglo-American Platinum Limited, 2018b, p. 12)

Apart from educational and healthcare programs offered in different countries, Glencore discloses information on two specific programs that may contribute to safeguarding the post-mining economy: agricultural extension work at the Antapaccay copper operation in Peru, as an attempt to improve local agricultural practises related to dairy and wool farmers; and a schools program at the McArthur River Mine in Australia aimed at delivering training for Parks and Wildlife management. Both of these programs appear relevant to the context of the application, but seem proportionally insignificant against the scale of economic decline and environmental legacies associated with mine closure.

Finally, few reports referred to reducing long-term risks and liabilities. Given the extensive costs attached to rehabilitation and the ongoing management of hazardous materials at sites, this is a critical area in which reporting can improve. We coded only one case in which the developer mentioned how the closure would affect infrastructure: 'The closure plans have focused specifically on redundant buildings and infrastructure' (Sibanye Stilwater Limited, 2018a, p. 50). This is particularly concerning in light of the industry's propensity to move projects into 'care and maintenance' or to divest assets as a means of avoiding the cost of rehabilitation. Too often, mining projects create long-term liabilities throughout their operational phase, which cannot be maintained when a mine closes.

## 5 | CONCLUSION

The demand for transparency in the mining sector has increased in intensity and scope since the 1980s. This has included requests for more significant reporting by companies on their financial arrangements and the effect these financial flows have on the surrounding economic, legal and regulatory systems in which those companies operate. Over the last 20 years in particular, companies have faced increased pressure on the social and environmental dimensions of their business with movements that have successfully put issues such as human rights, and indigenous self-determination on the international agenda. Scholars have criticised the voluntary nature of these reporting schemes noting that the counter-intuitive advantage of being able to self-select what is essentially disclosed or withheld (Alonso-Almeida et al., 2014).

Transparency scholarship in this same period has highlighted the respective advancements and deficits in global reporting practises. A critical point of emphasis is the extent to which transparency outcomes depend on whole-of-institution factors. This often-overlooked feature serves to explain the dynamic between the suppliers and



consumers of reporting information, and the centrality of this dynamic relation for achieving improvements in public accountability. Mine closure provides a powerful case in point, given the complexity of social and technical processes, the general lack of publicly available scholarship to enhance awareness about these issues, and the low-levels of company reporting as the underlying information base. This situation ensures breakages in the transparency cycle described by Fung et al. (2007) such that neither the suppliers nor consumers of information benefit from reporting efforts or the knowledge-based exchanges that could otherwise follow as a result.

Our findings confirm a certain level of efficiency in the reporting norms of mining corporations. Companies have responded to external demands using reporting instruments that promote the companies' commitment to the ethics of disclosure while simultaneously revealing very little. In some respects, this is a function of how external reporting norms have evolved, with a widening scope of reporting themes presented in strategically parsimonious language. Reporting themes directly speak to where companies, and transparency initiatives, receive more significant external interest, and therefore, it is unsurprising to note that much of the content in company sustainability reports appear to service this demand. This pattern is challenging for managing the social aspects of mine closure. This is particularly the case where reporting by tier 1 ICMM-member companies is minimal and reveals little in terms of the timing of proposed changes to the mine lifecycle, the anticipated societal effects, including the company's response. If sustainability reporting by tier 1 ICMM-member include insufficient detail on the aforementioned aspects, the question remains to what extent junior and mid-tier ICMM-member companies disclose similar aspects.

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