



Gender and sustainability reporting – Critical analysis of gender approaches in mining

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ABSTRACT

The mining sector remains economically significant across the globe. With a number of growing sustainability concerns (from environmental waste and pollution to social and ethical considerations), most major mining companies have highlighted sustainability concerns and social license to operate as corporate priorities. A number of case studies have also identified serious gender concerns, including disproportionate negative effects for women (especially for Indigenous, racialized, or women working in artisanal mining sectors). Here, we analyze gender dimensions of sustainability reporting to understand how large mining companies monitor and report on these concerns. This provides an understanding of what gender concerns are acknowledged and reported on by industry, as well as those that are not included. We selected a subset of large-scale mining companies that are considered likely to foreground commitments to these issues (members of the International Council on Mining and Metals, ICMM), and analyzed their recent sustainability reports to understand how gender and related intersectional issues are acknowledged, framed, and addressed in voluntary reporting by companies. Among other findings, we highlight that while some company reports highlight gender issues with respect to female employees, or maintaining community relations—this is often narrowly focused on women, rather than a broader gender or intersectional perspective. As well, we are able to identify a range of issues where specific effects for women are addressed, as well as a suite of concerns for which a broader gender and intersectional perspective is needed.

1. Introduction

The mining sector serves as the foundation for a range of development goals and economic production activities in many regions globally. Yet, industrial mining is associated with a range of sustainability concerns including disruptions to local livelihoods, cultures, and environments. Two notable recent examples are the 2019 collapse of the Brumadinho tailings dam in Brazil which killed at least 259 people and led to deleterious impacts on forest and agricultural land (Silva Rotta et al., 2020), and the destruction of the Juukan Gorge in Australia, which was of cultural significance to the Puutu Kunti Kurrama and Pinikura people (Wensing, 2020). In light of these sorts of examples, there is increasing and significant attention to the sustainability dimensions of mining, and an urgent need to mitigate ongoing detrimental

and often irreversible socio-environmental impacts (Campero et al., 2019; Lindman et al., 2020).

Within the context of socio-environmental effects of mining, a subset of the literature focuses on gender dimensions. This includes attention on the effects for women in mining communities and gender differentiated challenges for workers. As a brief overview, gender concerns related to the mining sector – including both large- and small-scale mining operations– have highlighted that the sector is overwhelmingly male dominated, and scholars have suggested that high levels of gender based inequality remain, including: sex-segregation of jobs, women occupying lower-status roles; or linked effects of idealized notions of nuclear families and male breadwinner roles, and other cultural and legislative factors (Lahiri-Dutt, 2015). Scholars have also highlighted that during a mining boom, there may be key gender differences in terms

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of migration patterns or who is able to reap economic benefits (Measham and Zhang, 2019). As part of this general terrain, consider that the maximum proportion of female employees in the mining industries within APEC economies is ~20%, although it is often less (Lay and Rodriguez, 2017). In Canada, women comprise 48% of the labour force in general but account for only 14% of mining industry employees (Natural Resources Canada, 2019).

Intersectional differences are also important, highlighting outcomes conditioned by race, ethnicity, impoverishment, Indigeneity or livelihoods. Intersectionality refers to the importance of not only considering men and women, but also how particular men and particular women may be situated differently vis-a-vis an issue of concern—along the lines of class, caste, race, locations or other important axes of difference.¹ While we focus on gender, the interactions between inequalities and systems of difference, notably with respect to race, class, livelihood, and Indigeneity (and possibly age, disability, and so forth), are likely to be very important for the analysis of mining offered here, as well as for possible future directions for consideration. For instance, large-scale mining activities often take place in Indigenous territory, while the associated benefits do not necessarily extend to those communities (Balch, 2013). Globally as well, there are marked differences in terms of where mining associated risks and benefits accrue (echoing patterns familiar in other extractive sectors along racial and North-South divides) (Brain, 2017). With respect to livelihoods, women are often involved in artisanal- and small scale mining (ASM), as well as mineral processing (Jenkins, 2014). However, because ASM is often an informal or family endeavour, those mining activities are not typically recorded or recognized (Jenkins, 2014). Women working in ASM may thus be counted as part of their husband's wages, rendering their contributions invisible. In cases where women do receive an independent wage, gender norms often prevent them from earning as much as their male counterparts (Stokes-Walters et al., 2021). As well, recent policy efforts to formalize the ASM sector can exacerbate gender inequalities (Buss et al., 2019), while formal mining and large-scale industries, or regulatory requirements (e.g. EIAs) also at times displace (or even criminalize) ASM, with linked gender effects (see also Spiegel, 2017; Tschakert, 2009; Rustad et al., 2016). All told, research has often assessed that, women – especially Indigenous and racialized women,² and those dependent on ASM – tend to be disproportionately and negatively affected by the mining industry (Campero et al., 2019).

¹ Intersectionality is a term that was first offered by Black Feminists to challenge some of the binarized understandings of inequality implicit in (white) feminist theorizing. As Crenshaw, 1989, 1991, Collins, 1990, and others offered, there is no universal experience of 'being a woman,' and thus called for greater attention to be paid to the particularities of race, class, disability or other key operations of difference. A key idea of intersectionality is that these considerations are not additive, nor are these dimensions possible to understand in isolation—but rather overlapping differences interact to mutually construct experiences and marginalities (see also Weldon, 2008). Even as we are not able to offer a fully intersectional analysis (our focus remains on gender), the concept is important to highlight key considerations that complicate binary gender framings, and to invite further inquiry to offer texture and specificity to the types of issues we raise (e.g. how racialized or Indigenous women may be affected in particular ways).

² We could use various terms here, such as BIPOC (Black, Indigenous, People of Colour), or people of colour. We prefer racialized (a term common in critical race studies, feminist theory, and allied work), as this is less inflected by considerations specific to North America, and offers instead a broader and processual framing around the importance of race to situating various individuals, bodies, and communities as different. Rather than invoking static categories such as "Black" or "Brown", racialized refers to iterative practices and discourses that mark certain bodies as racially 'Other.' As such, it refers to the active practices of racialization, rather than invoking racial categories as if they were meaningful in their own right (highlighting instead that these categories become meaningful and consequential precisely through practices of racialization).

In light of such concerns, this research involved a gender analysis of sustainability reports from a subset of the world's largest global mining companies to analyze the extent and the way in which these companies report on gender-related concerns. This allows us to shine a light on the gender issues that are acknowledged and monitored by industry, as well as those that are not considered. We expect that sustainability reporting should address a range of socio-environmental issues, from health of waterways to gender equity. It's likely that these topics will broadly reflect the types of issues covered in the Sustainable Development Goals (SDGs, for example, goal 1: Eliminate Poverty, goal 5: Gender Equity, and goal 8: Decent Work and Economic Growth, all of which are relevant to the mining sector), The SDGs were adopted in 2015 by the General Assembly of the United Nations as part of the 2030 Agenda for Sustainable Development (Rosati and Faria, 2019). The SDGs involve 17 goals and 169 targets, ranging from promoting gender equity, to ending world poverty and undertaking urgent action to combat climate change and its impacts by 2030. The SDGs have served as a key policy and planning tool for a range of sectors interested in achieving social, environmental and economic development goals, including mining (e.g. see CCSI and RMI, 2020).

The next section delves more deeply into relevant literature to highlight the broad range of gender concerns as linked socio-environmental concerns of relevance, before moving onto our methods, results, and discussion. The key question that guides our inquiry relates to how issues related to gender and gendered effects of mining are conveyed in sustainability reports, and what an assessment of such reports can offer to challenge and inform sustainability engagements in the mining sector. To the extent that these linkages are acknowledged, we aim to understand how these connections are being made, and what sort of data is offered in support of those goals, or what is being monitored and reported from the company perspective. To the extent that these linkages are not represented in the reports, we offer some perspective on what a critical gender and intersectional equity perspective might offer for more robust and gender-sensitive sustainability reporting, including some thoughts on how these issues might be more adequately and meaningfully addressed moving forward.

2. State of knowledge: sustainability and gender challenges in the mining sector

In the context of the range of adverse socio-environmental effects of mining, there is a persistent and widespread negative public perception of the mining industry (Fonseca et al., 2014). This in turn drives pressure on, and change within, the industry. For example, investors are pushing for increased transparency and accountability (Innis and Kunz, 2020) while many communities expect mining companies to exceed regulatory requirements, and to proactively engage with affected communities (Fraser et al., 2021). Concurrently, NGOs, social movements, and Indigenous peoples have increased their organizational capacity and coordination over the last 20 years, exerting greater pressure on mining corporations through direct and indirect means (Kapelus, 2002). These types of concerns link a range of issues including reputation of businesses, social license to operate, water, livelihoods, and other sustainability challenges (Hodge, 2014).

In line with this push, most major mining companies regularly publish reports to monitor and address key sustainability issues as a form of corporate disclosure (Daub, 2007; Fonseca et al., 2014; Higgins and Coffey, 2016; Roca and Searcy, 2012). These reports are referred to by a variety of terms; for the purposes of this paper, we refer to them as sustainability reports. The World Business Council for Sustainable Development (WBCSD) defines sustainability reports as "public reports by companies to provide internal and external stakeholders with a picture of corporate position and activities on economic, environmental and social dimensions" (World Business Council for Sustainable Development, 2003, p.7). As this definition makes clear, these are broad reports which extend beyond environmental concerns—including social,

equity, and gender. In sum, “such reports attempt to describe the company’s contribution toward sustainable development” (WBCSD, 2003, p.7). As of 2020, it is estimated that around 93% of the world’s 250 largest mining companies (by revenue) disclose social and environmental performance through these types of sustainability reports (UNEP, 2020).

An academic field has subsequently developed that investigates sustainability reporting to track and analyze the ways different companies and, sectors are responding to a variety of sustainability issues. Across sectors, there have been investigations on sustainability reporting in a broad range of industries, such as tobacco (Nara et al., 2019), high-speed railways (Azzouz and Jack, 2020), shipping (Wang et al., 2020), aviation (Kılıç et al., 2019), and higher education (Yalin et al., 2019). Investigations have considered whether or not sustainability reports increase stakeholder accountability and transparency (Boiral and Heras-Saizarbitoria, 2020; Fernandez-Feijoo et al., 2014), the relationship between institutional factors and discussion of SDGs in sustainability reports (Rosati and Faria, 2019), and the disclosure practices of large versus small companies (De Villiers et al., 2014). While there is an extensive body of literature focussed on sustainability reporting, the subset which focuses on the mining industry remains limited—despite the obvious salience of such analysis. Examples of studies focusing on the mining industry have considered topics including water reporting (Northey et al., 2013), the symbolic nature of sustainability reporting in the mining industry (Böhling et al., 2019), whether or not sustainability reporting is actually effective at instigating change (Devenin and Bianchi, 2018), the evolution of mining sector reporting over time (Perez and Sanchez, 2009), as well as a range of case studies focused on specific countries, mines, or companies (Amoako et al., 2017; Mahmood and Orazalin, 2017; Murguía and Böhling, 2013; Trireksani and Djajadikerta, 2016). Several of these highlight the ineffectiveness of sustainability reports, in terms of failure to contribute to community needs, or to ensure sustainability in the long run, and so forth (Devenin and Bianchi, 2018).

Even with such attention in the literature, analysis of gender dimensions of sustainability reporting for mining companies remains near non-existent. Indeed, one investigation into social responsibility in the mining industry concluded that gender in the mining industry is a “clearly unexplored” issue that needs to be addressed in future research as it relates to corporate social responsibility (CSR) in mining contexts (Rodrigues and Mendes, 2018). Our paper responds to this need. Guided by the literature on gender and sustainability in general, and gender and mining in particular, we seek to understand the degree to which these linkages are acknowledged in mining industry reporting, how they are understood and reported, and relatedly what data is being collected, if at all, to monitor and track progress on these issues.

Before introducing the methodology and analysis, we offer a more detailed discussion of the state of knowledge on gender and intersectional dimensions of mining. Our review of the literature revealed several broad considerations of interest: (1) the socio-cultural and economic effects on communities; (2) differentiated health effects, including physical and mental well-being; and (3) broader intersectional considerations informed by gender analysis (i.e. those in mining communities may experience the effects of mining differently depending on age, ethnicity, education, Indigeneity, familial/marital status, livelihood, etc ...). As highlighted in the sections above, the literature also considers gendered labour experiences in the mining industry—we do not explore this issue further as this is relatively well elaborated in the literature (Moalusi and Jones, 2019; PwC, 2015). The next section provides more details on each theme, including overview of relevant case studies and the evidentiary base for these linkages, before turning to our methods, results and discussion of the content of mining sustainability reports.

2.1. Socio-cultural and economic effects of mining, and criminalization in communities

With the establishment of mining operations, nearby communities may experience land dispossession, pollution, or see their lands drastically altered. This can lead to economic insecurity and the loss of traditional livelihoods (McIntyre et al., 2016), as well as other effects. In poorer communities, environmental degradation can lead to rapidly depleted subsistence bases, often with severe consequences for women (Lahiri-Dutt, 2015). Agricultural dispossession can also result in reduced ability to work on remaining land as rural men migrate to cities in search of cash income. These shifts can also contribute to the breakdown of traditional social structures and the denial of ethnic and cultural rights. Studies have shown that women are again often especially adversely affected by such cultural changes, particularly shifts that devalue women’s work and their status as decision-makers or land-owners (Lahiri-Dutt and Mahey, 2010).

In line with many of these documented shifts, the arrival of a mining company or other extractive industry is frequently met with community protest and resistance. As detailed in diverse geographic regions, protest and resistance is often organized by female activists (Hernández Reyes, 2019; Jenkins, 2017), or led by Indigenous land defenders (Le Billon and Lujala, 2020). Social organizations and civic protest are sometimes criminalized, and at times territorial violence has occurred on behalf of international mining companies, governments, or paramilitary forces (Campero et al., 2019). Indeed, an analysis of land defenders killed between 2002 and 2018 showed the such killings were most frequently associated with agro-industrial and mining projects (Le Billon and Lujala, 2020). The use of force has also been documented in instances when there is already Artisanal-Scale Mining (ASM) taking place in the area—in such instances, ASM industries are sometimes deemed “illegal” – leading to the use of violence against people engaged in those livelihoods (Rustad et al., 2016). When compensation occurs for mining associated losses, it is often men that are compensated, given land tenancy, ideas of household-heads, and similar considerations (Jenkins, 2014). This may again negatively affect women in that flow of cash may be spent by men on things less likely to contribute to wellbeing of the family (e.g. alcohol or prostitution rather than schooling or health), which in turn, may aggravate gender-based violence (Jenkins, 2014).

2.2. Health effects of mining

The literature on mining and health is extensive, spanning a wide range of commodities, mine sites, and practices. The conclusions of these studies thus vary significantly. While we are not able to summarize these effects in their entirety, it is nonetheless important to consider differentiated health effects of mining from a gender perspective.

In terms of general health effects, proximity to mining activity has been associated with various health issues (von der Goltz and Barnwal, 2019). For example, Taiwo and Awomeso (2017) outlines human health risks associated with artisanal gold mining in Nigeria; they found that levels of aluminum and iron in surface water were higher than the level recommended by the WHO (World Health Organization), and that the Cancer Risk (CR) values for cadmium and chromium were within a range that established carcinogenic effects. The health effects of mining are not limited to developing country contexts. For example, a systematic review by Mactaggart et al. (2016) analyzed 16 articles relating to coal and coal-seam gas mining within high-income countries including Canada, the United States (US), Australia and Italy. They found that the risk of cardiopulmonary, lung, kidney and cardiovascular disease, and diabetes increased with increasing proximity to heavy coal production. Many of the documented health effects of mining relate to concerns for mining workers themselves, for instance, the high incidence of lung related diseases and cancers among coal miners, or uranium miners (Kuletz, 1998). As mining workers are often men (or Indigenous men), these realities expose important considerations for gender and health in

mining. As another example, gold mining selectively exposes women to the worst effects of mercury contamination (Lahiri-Dutt et al., 2021), while there has been evidence of contamination of breast milk for women living in mining communities, spanning diverse areas including Kenya, Ghana, Spain, and Iran (Bansa et al., 2017; Ettyang et al., 2005; Islam et al., 2014; Motas et al., 2021; Örün et al., 2011). These are among many other examples of the structural and social determinants of health, whereby gender, location, social class, age, education, income, labour practices, or place of residence, all affect health and well-being (Leuenberger et al., 2021). For broader well-being and mental health considerations as well, effects of mining have been linked to gendered outcomes for social lives, community connectedness, social isolation, and other stressors (Lovell and Critchley, 2010).

2.3. Other Intersectional considerations

Even as the common conclusion is made that women are particularly affected by mining, it is clear that not all women are affected equally, and that gender dynamics can expose other groups to harms—for instance, deleterious effects can be experienced among men and with respect to other intersectional categories of difference and inequality (e.g., male mining workers, or in Indigenous, and racialized communities, Jenkins, 2014). Given that gender analytics increasingly highlight such intersectional concerns (Grenshaw, 1989, 1991; Weldon, 2008), we explicitly sought to consider how these issues were addressed, or not, in how companies themselves understand and report on gender and sustainability concerns.

All of the above considerations highlight the importance for mining companies to monitor and report on gender issues as part of their sustainability reporting. The next section offers further details on our methodology and analysis, before moving to our results, discussion, and conclusions—revisiting some of these themes from the literature as helpful.

3. Methodology

3.1. Overview

Responding to the issues and gaps described above, we analyzed sustainability reports published by 27 major global mining companies. This subset of the companies was selected due to the explicit commitments they have made to report on socio-environmental considerations. Putting this together with key insights from the literature, we identify focal issues where more reporting is likely warranted for more transparent and robust characterization and response to these issues. For our purposes, sustainability reports serve as a key platform on which mining companies can voice their positions on issues relating to gender and mining, and to publicize details of attempts made to mitigate and/or take leadership at addressing areas of concern. It also reflects the issues that are deemed important enough for companies to be collecting data and monitoring, as well as issues where investors and communities may be pushing for action.

3.2. Development of the analytical framework

We limited the scope of this study to companies that are members of the International Council on Mining and Metals (ICMM). This group of 27 mining and metals companies seeks to “strengthen environmental and social performance and serve as a catalyst for change, enhancing mining’s contribution to society” (ICMM • About Us, n.d.). As a membership commitment, these companies adhere to the ICMM’s Mining Principles, which “incorporate comprehensive environmental, social and governance requirements, robust site-level validation of performance expectations and credible assurance of corporate sustainability reports with annual disclosure.” We therefore selected these companies with the expectation that they would be most likely to be at the forefront

of sustainability issues, including social issues such as gender. However, we recognize that this ‘best-of-sector’ approach may have its own limitations; many small companies may be doing considerable work on gender and other sustainability-related issues as a way to build their reputation and would not have been included in our investigation. That said, this analysis should nonetheless generally be read as a sort of ‘best case scenario’ in that other companies that have not made similar commitments were excluded by design.

To provide the most up-to-date information, we restricted this analysis to reports published in the most recent reporting period at the time of data collection (May - August 2020); this corresponded to 2019 sustainability reports. If a company didn’t publish a report in 2019, we defaulted to the 2018 report. If a company did not release a report in 2018 or later, the company was excluded from the analysis. The reports were sourced via a three-tiered search: (1) directly searching company websites, (2) reviewing GRI’s Sustainability Disclosure Database, and (3) a Google search. Some consideration was given to the notion that companies may often publish information we might expect to find in a sustainability report on company websites and other reports and media, but for consistency, only sustainability reports or integrated annual reports which included sustainability reporting (e.g. in the case of Sibanye Stillwater and Sumitomo Metal Mining) were analyzed. Ultimately, this meant that 19 sustainability reports from 2019 to 8 sustainability reports from 2018 were analyzed for a total of 27 reports (out of 27 ICMM members as of 2020). The 27 company reports included in the analysis are African Rainbow Minerals (2019), Alcoa (2019), Anglo American (2019), Anglo Gold Ashanti (2019), Antofagasta Minerals (2019), Barrick (2019), BHP (2019), Codelco (2018), Freeport-McMoran (2019), Glencore (2019), Gold Fields (2018), Hydro (2018), JX Nippon Mining and Metals Corporation (2019), Minera San Cristóbal S.A. (2018), Minsur (2018), Mitsubishi Materials (2019), MMG (2019), Newcrest Mining Limited (2019), Newmont (2019), Orano Mining (2018), Polyus (2019), Sibanye Stillwater (2019), South 32 (2019), Sumitomo Metal Mining (2019), Teck (2018), and Vale (2019). Rio Tinto did not produce a full sustainability report in 2019 but produced a “sustainable development report” in 2018, which appeared to be akin to a sustainability report, so that was included (Rio Tinto, 2018).

Concurrently, a literature search was conducted to identify current areas of concern relating to women and the mining industry. Based on this, a set of research questions were developed; these research questions were cross-referenced with indicators listed under Sustainable Development Goal (SDG) 5, “Achieve gender equality and empower all women and girls”, for which some of the relevant indicators included: (5.1) End all forms of discrimination against all women and girls everywhere; (5.4) Recognize and value unpaid care and domestic work; (5.a) Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources; and (5.c) Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels. These indicators provided a useful framework to consider how those research questions might be organized—allowing us to develop a coding framework. Although the ICMM Principles also provided a potential framework for coding, they don’t mention women’s rights or gender equality in ways that are as explicit as the sustainable development goals; the only principle that explicitly mentions gender is principle 3 (human rights), indicator 3.8 (promote an inclusive workplace). Thus, the sustainable development goals provided a more useful basis to guide our coding.

Codes are generally organized into concerns relating to mining employees, mining communities, and mining companies. Specific sub-concerns are coded as nodes within the framework where appropriate (for example, under “mining communities” we might have “education opportunities” and under that “scholarships for women” and “building of schools”). The coding framework was cross validated by a collaborator; with the two researchers simultaneously coding one report based

on the initial framework. The two parties then compared the ways they interpreted the coding framework (and consequently, made decisions and refinements to the codes and process). As such, some nodes were either re-organized, developed further, or removed. All reports were then read and coded by Author1 using NVivo software. After each report was coded, a final search of a list of keywords was conducted to ensure that nothing was missed (e.g. searching words such as “women”, “children”, “education” that were commonly found with the relevant codes). This was an extra step to ensure that coding had been comprehensive. However, because of the large amount of data collected, we acknowledge it is possible that some references were missed. More details on the coding process, the final coding framework, and validation steps, are provided on our website for those interested in further details (<https://edges.sites.olt.ubc.ca/research/gender-and-mining/>).

4. Results and discussion

Overall, we find that mining companies tend to address gender-related concerns to varying degrees during their reporting on sustainability issues along a spectrum: (1) issues were noted and discussed with specific mention of gender and/or women; (2) issues that *could* and *should* have included a gender and intersectional lens were broadly discussed, but without explicit attention to gender dimensions or ways that mining issues or employment might differently affect men and women, or broader intersectional/gender relations; (3) issues that are noted from the literature to have a gender dimension but that were not discussed in the reports at all. We present each of these examples in turn, following the summary in Table 1.

4.1. Category 1: issues that were discussed with a gender lens

We identified several initiatives where mining companies address gender-related concerns, notably attention to women who were employed in mining companies and women living in mining communities.

4.1.1. Attraction and retention of female employees in mining companies, flexible working programs

With respect to employees, a wide range of initiatives were either meant to attract more female talent or to retain, promote and mentor female employees. Examples of such initiatives include African Rainbow Minerals’ (ARM) Women Development Program, which “aims to develop leadership competencies, create talent pools to accelerate

Table 1

Overview of the extent to which mining company reports address gender-related concerns when reporting on relevant sustainability issues.

Issues discussed with a gender lens (category 1)	<ul style="list-style-type: none"> • Attraction and retention of female employees in mining companies + flexible working programs • Improvement of women’s education and livelihoods • Inclusion of women in community consultation + recognition of women as stakeholders • Recognition of women’s right to land (<i>Note: covered in one report only</i>) • Issues related to violence against women, influxes of cash, and domestic violence
Issues discussed broadly, yet without a gender lens (category 2)	<ul style="list-style-type: none"> • Criminalization of illegal mining + anti-mining sentiment, political turbulence • Effects of land dispossession and loss of traditional livelihoods • Cultural and human rights implications of mining • Health effects of mining
Issues that were not discussed at all, but that are suggested by the literature (category 3)	<ul style="list-style-type: none"> • Overall intersectional lens • Subsidization of unpaid care work • Effect of mining on mental health

development and improve promotional opportunities for ... female employees” (African Rainbow Minerals, 2019; p 27); Glencore’s WeLead Circle initiative, a mentoring program (Glencore, 2019, p.50); Alcoa’s Catalysts for Change program (Alcoa, 2019, p.46); and Freeport-McMoran’s Women Development Day (Freeport-McMoran, 2019, p.34). There was also a variety of flexible working programs targeting both male and female employees; these are generally aimed at those with childcare and family responsibilities who can take advantage of this. Examples of companies that implemented flexible working programs included Anglo American, BHP, Codelco, and Gold Fields (Anglo American, 2019; BHP, 2019; Codelco, 2018; Gold Fields, 2018).

4.1.2. Improvement of women’s education and provision of livelihood opportunities

We found several examples of initiatives to improve women’s education and livelihoods including Newcrest’s Nursing and Midwifery training program in the PNG; ARM’s Girl Child initiative, which provides support in maths, science and life skills to female learners in Grades 10 to 12; Anglo Gold Ashanti facilitating the development of the Obusi Campus of Kwame Nkrumah University of Science and Technology, whose student population is ~30% female (African Rainbow Minerals, 2019; Anglo Gold Ashanti, 2019; Newcrest Mining Limited, 2019).

4.1.3. Inclusion of women in community consultations, recognition of women as stakeholders

A central topic discussed across the sustainability reports studied are the community relations between mining companies and communities. Companies often described how they maintain good relations with communities, e.g. BHP’s “collaborative community approach” involving understanding communities, comprehensive planning, effective implementation, and monitoring performance (BHP, 2019, p.60). Within this context, companies will also mention reporting mechanisms available to mining communities and employees to report incidents, such as Anglo Gold Ashanti’s Community Information Management System (CIMS) (Anglo Gold Ashanti, 2019). If there are either very few or no significant community incidents, companies tend to note this and to disclose some level of detail on community incidents that have taken place.

We noted some evidence of mining companies distinguishing between maintaining good relations with communities as a whole and maintaining good relations with *women* in those communities. For example, ARM (2019) recognizes women as community stakeholders (p.33) and state that they “include women as stakeholders in consultation processes” (p.99), engaging with women during women’s forums (considered “ad hoc engagements”) (p.34). Additionally, Anglo Gold Ashanti (2019; p.14) stated that “Effective communication with key stakeholders such as women ... linked to our business is increasingly important,” and recognizes women as a stakeholder group with specific interests in the mining industry. Barrick (2019; p.37) established Community Development Committees (CDCs) within the local community whose role is to allocate the community investment budget to those projects and initiatives most needed and desired by the local communities; each CDC is elected and is made up of a mix of local leaders, community members and representatives from local women’s and youth groups. Finally, South 32 (2019) worked with the organization Action Aid and the Greater Phola Ogies Women’s Forum (GPOWF), to address gender-specific concerns surrounding their operations in both Australia and South Africa (South 32, 2019; p.23).

4.1.4. Women’s right to land

ARM was the only company found to specifically mention the property rights of women, in saying “We actively recognize women’s rights to property and resources, including women as stakeholders in consultation processes ... ARM’s CSI and LED projects focus on building capacity in local communities and prioritise women” (African Rainbow Minerals, 2019, p.99).

4.1.5. *Issues related to violence against women, influxes of cash, and domestic violence*

Overall, there was more emphasis on the negative effects of mining on women as a result of new mining activity than might have been expected. For example, [Anglo American \(2019; p.67\)](#) mentioned that “Mining communities often present characteristics that enable [gender-based violence], such as unequal power relationships, women who are financially dependent on men, weak institutions, migrant labour and substance abuse.” [Anglo Gold Ashanti \(2019; p.20\)](#) mentioned that “In some instances, we see large influxes of people where previously there were few, potentially bringing issues relating to ... sex work and an increased burden on existing health infrastructure.” [Newmont \(2019; p.158\)](#) mentioned that “Population influx due to mining activities result in increased pressure on social amenities and social disruptions (e.g., illegal mining, increase in crimes, gender imbalance, alcoholism) within the communities.” Some reports also emphasized initiatives to mitigate these effects, such as Anglo American’s Living with Dignity Programme and Newmont’s investment in social infrastructure through the Ahafo Development Foundation ([Anglo American, 2019; Newmont, 2019](#)). While these issues were acknowledged by some companies, it did not appear that they were monitoring or otherwise addressing these issues in a systematic way, and the language can often be taken to place blame of these issues with communities themselves (e.g. due to influxes of people), rather than seeking to understand linkages with mining operations and extraction, per se. It is also clear that for many of the above examples, where gender and mining are acknowledged as linked, the focus often remains narrowly on women, rather than incorporating a broader gender or intersectional lens. This is an overarching finding of the analysis—to the extent that gender is addressed, it is often through a narrow focus on women. Broader gender issues, and intersectional concerns, remain absent.

4.2. *Category 2: relevant issues discussed but without a gender lens*

In this sub-section, we turn to the sustainability issues that were broadly addressed by companies, but without a specific mention of gender dimensions.

4.2.1. *Criminalization of illegal mining, anti-mining sentiment, and political turbulence*

Although our analysis focussed on sustainability reporting efforts by the large-scale mining sector, we expected to find evidence of efforts by companies to engage with ASM miners operating in or near large-scale mining concessions. Globally, ASM directly employs about 40.5 million people, with another 150 million people being dependent on the sector ([Weldegiorgis et al., 2018](#)). We were interested in whether the companies studied would discuss ASM through a gendered lens: as noted by [Lahiri-Dutt \(2015\)](#), the range of informal mining practices is characterised by the large number of women working as wage workers, diggers, panners, processors and traders of mineral commodities, with women making up an estimated 30%–50% of the total workforce of ASM ([Weldegiorgis et al., 2018](#)). From our literature review, we expected to see evidence of women protesting the arrival of mining companies, coordinating petitions, disseminating information on the negative impacts of mining, or establishing contacts with national NGO’s ([Jenkins, 2015](#)). We looked for evidence of mining companies mitigating or responding to this sentiment in some way, for example, by working directly with women’s groups or seeking to decriminalize the activities of women’s anti-mining groups. This would have been consistent with encouragement by the World Bank and other donors, NGOs and private sector actors who have increasingly encouraged the large-scale mining (LSM) sector to “partner with and support local ASM operators” ([Hilson et al., 2020](#)). Although ASM miners have a long history in many mining regions globally, these producers are not necessarily recognized in the formal economy and often operate ‘illegally’ in that they do not have a regulatory permit ([Luning, 2014](#)). This has created significant tensions

between LSM and ASM miners, despite recent international efforts to formalize the ASM sector ([Hilson et al., 2021](#)).

Six companies directly mentioned illegal mining, nine companies directly mentioned artisanal-scale mining, and five companies mentioned political instability or other kind of turbulence in the regions in which they operate. Only one company, Goldfields (2018), mentioned anti-mining sentiment, and four companies mentioned protests in response to mining or mining activities (either by mining community members employed by the company or other mining community members). Several reports referred to criminal activity relating to mining, particularly related to ASM and illegal and/or informal mining, but details regarding those criminal activities and how they were handled by mining companies were vague – for example, Anglo Gold Ashanti’s report states that they “work with local law-enforcement agencies” ([Anglo Gold Ashanti, 2019, p.34](#)).

Illegal mining was not discussed in terms of how it affects people with other intersectional identities (for example, race or economic status), but it was noted in the reports that illegal mining is often caused by deteriorating socioeconomic conditions and population influxes. For example, [Anglo Gold Ashanti \(2019\)](#) noted that “The number of artisanal and small-scale miners operating in the region continues to increase due to migration into the area by people fleeing drought and armed conflict in the greater Sahel region” (p.32) and “Major mining markets across Africa continued to face growing risks from ASM and illegal mining activities in 2019, exacerbated by the stronger gold price and deteriorating socio-economic conditions” (p.40). [Newmont \(2019; p.158\)](#) mentioned that it saw “Population influx due to mining activities resulting in increased pressure on social amenities and social disruptions (e.g., illegal mining, increase in crimes, gender imbalance, alcoholism) within the communities” were a potential or actual impact of their mining activities. Again, these examples were not given in terms of acknowledging or addressing the concerns and interests represented, but rather these were noted more as a threat to the community, or affirming the illegality of such activities (rather than considering the broader dynamics at play). Specific risks or precarities to women, or racialized Indigenous populations were not explicitly acknowledged.

On a broader level, to the degree that illegal mining, ASM, and political instability/turbulence were discussed, this remained in the context of how they affected mining companies and business operations, rather than broader sustainability concerns, per se. For example [Anglo Gold Ashanti \(2019\)](#) noted that “Illegal and ASM mining activities continued to pose a significant challenge to our operations ... In South Africa, gold producers continued to face an escalation in violent crime-related activities as a result of large armed criminal groups and illegal miners intruding into and invading mining areas,” (p.32) and that they “reverted to monitoring ... in an effort to reduce the possibility of conflict” (p.33).

4.2.2. *Effects of land dispossession and loss of traditional livelihoods*

We sought evidence of companies acknowledging the ways in which land dispossession affects communities at large, how this can lead to losses of traditional livelihoods, or how these two factors at times disproportionately affect women or other marginalized community members, and/or descriptions of attempts to mitigate those effects. Comparative studies have shown that land-dispossession caused by extractive industries – often coupled with gender-blind compensation policies – “reproduced women’s lack of independent land rights or reversed them where they existed; intensified household reproductive work; and occurred without meaningful consultation with or delegation of decision-making power to women” ([Levien, 2017, p 1113](#)).

Only four reports mentioned land ownership and how they worked with stakeholders and previous owners to ensure fair purchasing. For example, [Glencore \(2019; p.35\)](#) stated: “We recognize that we are custodians of the land on which we operate and are committed to responsible land ownership and meeting community expectations” and [Newmont \(2019; p.54\)](#) stated, “We seek to understand environmental

impacts, the ASM value chain, traditional land ownership and control of ASM activities, and the role of ASM in local socio-economic development.” Furthermore, although this doesn’t directly mention land dispossession, [Alcoa \(2019; p.63\)](#) mentioned that “women often have been excluded from key decisions that affect the allocation and use of natural resources.” Although ARM (2019) recognized the effects of land dispossession in attempting to recognize women’s property rights, more explicit acknowledgement of these issues by a greater number of mining companies would be important to advance the approach by companies to these issues. Furthermore, we expected these issues to be more acute in certain contexts, as such, the location of the mining might be as important as the company engaging in mining in terms of determining the relevance of these concerns to the operation, or overall sustainability of the engagement.

In terms of loss of traditional livelihood in a general sense (regarding economic opportunities), 8/27 companies mentioned some sort of business or economic development program that specifically benefited or related to women in mining communities, or that were targeted at both men and women. Nearly a third of companies mentioned the term “livelihood,” in the context of loss of livelihood due to mining activity, and mitigative tactics in this area. Examples include [Glencore \(2019; p.42\)](#) stating “Human rights artisanal and small-scale mining (ASM) represents an important livelihood and income source for many poverty-affected populations around the world,” [Barrick \(2019; p.45\)](#) stating “As far as is practicable, we work in partnership with our host communities, governments and specialist NGOs to develop mutually beneficial long-term strategies to reduce or eliminate ASM. A key part of this approach includes working to develop alternate livelihood opportunities for ASM communities,” and [BHP \(2019; p.59\)](#) stating “We aim to enhance human capability and social inclusion through increasing the number of people with improved health and wellbeing, access to quality education and vocational training, and enhanced livelihood opportunities.” However, of the companies that did mention business or economic development opportunities that benefited women, there was rarely a connection made to loss of economic opportunities and livelihoods as a direct consequence of mining. Rather, these concerns were only noted in general terms as if they were pre-existing. Again, it is notable that the mention of ASM by [Barrick \(2019\)](#) is a reaffirmation of the illegitimacy (and thus need to eliminate) ASM.

Across the reports analyzed, there was one acknowledgement that mining leads to a loss of traditional livelihoods and income, when [MMG \(2019; p.10\)](#) stated “Work has begun to better understand social impacts from closure on neighbouring communities at the Kinsevere mine. This includes investigating workforce transition planning, alternative livelihoods and artisanal mining.” There was no discussion of the specific effects of loss of traditional livelihood on any specific demographic considerations. Again, returning to key insights and themes from the literature, loss of land and income can disproportionately affect women and other marginalized community members in terms of coping with decreasing food security, dealing with the loss of communally owned land (which women tend to be heavily invested in), and in relation to their roles in building and maintaining communities (as communities become sites of conflict with splits emerging within communities and even families, over the presence of mining in local area) ([Jenkins, 2014](#)). The literature also highlights particularly adverse impacts for Indigenous women, tribal, Adivasi, or dalit women, or those from other minority groups ([Jenkins, 2014](#)).

4.2.3. Cultural and human rights implications of mining

We sought explicit mentions of the disproportional effect that cultural loss has on women or gender relations, particularly where cultures might have previously valued women’s productive work and their status as decision-makers and landowners, or other specific labours or practices that might be affected by mining. We would have, for instance, noted explicit mention of cases where women are the custodians of cultural customs, and may lose status or positions of power with the

introduction of new economies and other practices due to mining activity. In terms of human rights, we sought recognition that women’s rights may be violated to a greater extreme than men’s due to gender and sex differences; for instance, in the context of sexual and/or domestic violence.

Mentions were made in virtually every report to human rights, particularly about companies not having any human rights violations or having zero tolerance towards such violations, as well as policies in place to make sure that employees did not experience human rights violations (particularly at mine sites). Many companies also mentioned supporting guidelines related to Human Rights such as the UN Global Compact and United Nations Declaration of Human Rights. However, only three companies, ARM, Barrick, and MMG, specifically mentioned women’s rights in a manner showing separation from general human rights. Examples include ARM (2019; p.99) stating “We actively recognize women’s rights to property and resources,” [Barrick \(2019; p.66\)](#) stating “In the Dominican Republic, gender-based violence is a serious problem ... That is why we established a Gender Ambassador program ... The objectives are to ... increase awareness of women’s rights,” and [MMG \(2019; p.8\)](#) mentioning human rights as a material issue and describing this as “Managing the impacts of our operations on human rights. This includes ... the rights of women and children.”

There did not seem to be mention in any report of human rights being violated, and particularly in ways that might specifically focus on violations regarding women and girls. Additionally, all companies mentioned either upholding and respecting traditional cultures and cultural rights in some way, particularly in the context of Indigenous peoples. However, we did not find specific mentions of how cultural losses due to mining affects gender dynamics, or women in particular. Again, as we emphasize further below, a broader intersectional perspective on these issues was also missing.

4.2.4. Health effects of mining

We sought explicit mentions of the gendered dimensions of effects of mining on the health of mining communities (e.g. for male mine workers) or the disproportionate health effects that mining may have on women’s health, as described through key themes from the literature, above. We were also looking for health initiatives that specifically targeted the health effects of mining on women, reproductive health, neonatal care, breastfeeding, and so forth.

The ways in which mining activity causes health issues among mine workers was discussed to some degree – for example, the potential for noise-induced hearing loss and respiratory problems, and preventative measures were noted. Some companies also discussed programs related to the health of male and female workers, and the specific benefits to women were quantified ([Polyus, 2019](#)). However the commentary was very broad, and the specific gender or intersectional dimensions of the issues were not highlighted.

Issues relating to women’s health in general – but not explicitly those caused by mining activity— were noted by three companies. Examples include [Newcrest \(2019\)](#) starting a program to increase midwifery training in PNG and investing in HPV vaccination support for 6000 girls, and [Minera San Cristóbal \(2018\)](#) starting a “Safe and healthy motherhood program”, which involved monitoring 87 pregnant women, through prenatal controls, delivery care and newborn care, as well as post-delivery care. The latter example is notable because the target population of this program was female workers, female beneficiaries and pregnant women. However, there was no emphasis by any company on the *specific effects of mining* on women’s health, despite the knowledge of the above-described effects. Gender based violence, although explicitly mentioned by several companies ([Anglo American, 2019](#); [Anglo Gold Ashanti, 2019](#); [Barrick, 2019](#)) as being an issue in the areas where they operate, was not recognized as a female health issue. Finally, there was no recognition that women in mining communities sometimes subsidize the mining industry through their unpaid care work in reproducing and feeding their family and dealing with the health

consequences resulting from mining (often in a context of inadequate healthcare provisions); the closest thing there was to any policies related to this were flexible working policies.

4.3. Category 3: issues not discussed at all (but suggested by the literature as important)

4.3.1. Topics mentioned in the literature that were not mentioned in the reports

A range of issues identified in our literature review garnered no mention in the sustainability reports, such as: adopting a broader intersectional perspective beyond narrow focus on women, subsidization of unpaid care work (i.e. as explained above, it can be argued that some women in mining communities are effectively subsidizing the mining industry through their unpaid care work), effects of mining on mental health, community cohesion, and other broad effects.

4.3.2. Lack of broader intersectional focus

In spite of broad recognition that mining negatively affects “women”, as discussed in Jenkins (2014), the reports lacked attention to how those effects varied among women due to differences in their socio-cultural statuses – for example, being Indigenous, LGBTQ, racialized, etc. There were a few minor exceptions. Notably, (2019), Freeport-McMoran (2019), and Teck (2018) all mentioned initiatives targeting Indigenous or racialized women. ARM (2019) mentioned special emphasis in its initiatives and policies on supporting “Black women,” and Minsur (2018) mentioned an economic development initiative to support peasant women. Of the 5/27 companies that did have initiatives targeting women whose identity intersected with other statuses, none actually mentioned the need for such in explicit terms of how the negative experiences of these women would be different compared to other women. We did not see evidence of other broader intersectional dimensions (vis a vis race, caste, class, age, etc), though some of these might have been less easy to highlight given our methods (e.g. because discussions regarding impoverishment or livelihoods might have been less visible given our search terms and coding framework, for instance).

That said, we did aim to attend to intersectional difference in our reading and coding of the reports, attending to whether the language of the reports (1) recognized differentiation among women of their experiences with mining activity and (2) attempts to mitigate the disproportionate effects of mining for some community members (according to race, class, livelihood, etc). As noted, we were also attentive to broader concerns related to Indigeneity, racialized identities, impoverishment or other axes of difference and inequality. While we are not surprised that a broader intersectional perspective was generally missing, we nonetheless consider this to be an important finding, especially when we consider what we might expect and hope for in ways that are consistent with current approaches to gender, and intersectional dimensions of mining from the literature (see sections above).

4.4. Study limitations

It should be noted that all of the conclusions above are drawn based on the text that could actually be found in the sustainability reports. The coding process was quite comprehensive, with each report being read in full and coded in detail, and conclusions that were drawn were also verified using multiple keyword searches. However, between the large number of sustainability reports and the length of each sustainability report, we recognize that it is wholly possible that some references were missed due to human error.

5. Conclusion

In this paper, we’ve analyzed 27 sustainability reports published by mining companies that are a members of the International Council on Mining and Metals (ICMM) for their discussion of issues related to

gender and intersectional dimensions of mining. The literature shows us that the activity of mining companies in mining communities has been associated with a range of concerns that merit consideration from a gendered lens, for instances, ways that mining differentially and disproportionately affects women or other marginalized community members in mining communities, such as land dispossession, criminalization of illegal mining and anti-mining activity, and loss of traditional culture. We analyzed whether mining companies explicitly discussed these problems and their connection to mining, and whether they made specific efforts to mitigate those effects. Ultimately, we found that although some problems were specifically mentioned with attention to women narrowly, a broader gender and intersectional perspective was largely missing. As well, even issues that might be of concern for women were only partially addressed. Furthermore, while a number of companies had initiatives in place that targeted women, they generally failed to describe why they were necessary. This prevents the reader from fully understanding whether or not the initiatives were important, or even successful.

While we laud the evidence that some attention is being paid by mining companies to particular effects of mining for women, a broader gender and intersectional lens is needed to more adequately address the full range of sustainability concerns recognized within the literature. For efforts focused on women per se, more needs to be done to acknowledge the broader contextual factors that make such efforts important. As well, more consideration needs to be given to the unique situation of particular women, as well as how broader issues play out in ways that are differentiated and unequal. Framing these issues in terms of gender and intersectional perspectives will go a long way towards achieving this end.

CRedit author statement

Phyllis Lesnikov: Investigation, Methodology, Software, Validation, Writing- Original draft preparation, Writing - Review & Editing, Data Curation; **Nadja C. Kunz:** Conceptualization, Methodology, Supervision, Writing - Review & Editing, Funding acquisition; **Leila M. Harris:** Conceptualization, Methodology, Supervision, Writing - Review & Editing, Funding acquisition.

Data availability

Further details of our methodology available through our website, as explained in the paper

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