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## COVID-19 in artisanal and small-scale mining communities: Preliminary results from a global rapid data collection exercise

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### ABSTRACT

As early as March 2020, anecdotal reports and some news stories began trickling in about COVID-19 related restrictions and their impacts on strategic mineral supply chains, and the miners who labor in the informal mining sector. However, these reports were few and far between. Imperative was the need for a more accurate and comprehensive picture of the situation, should development partners wish to respond rapidly and accurately to the possible crisis developing in artisanal and small-scale mining (ASM). The World Bank, along with a range of development partners,<sup>1</sup> set out to understand how COVID-19 is influencing the development trajectories of select ASM communities (Delve, 2020a). By way of a standardized short questionnaire administered by telephone, researchers conducted rapid surveys on a bi-weekly basis with miners in ASM communities spread across 22 countries (Delve, 2020a) and mining a total of nine minerals.<sup>2</sup> The questionnaire contained seven main areas of inquiry: (i) knowledge on COVID-19 and its prevention; (ii) access to work; (iii) food security; (iv) human security; (v) service delivery; (vi) supply chains; and (vii) recovery perspectives. More than 3400 responses were gathered over the full data collection period, providing rich snapshots of the impacts being felt by mining communities. The results, as discussed in this viewpoint piece, suggest that whilst ASM continues to offer important livelihoods, even amidst crisis such as COVID-19, the sector is yet to be fully integrated into sustainable development discussions. Formalization, a broad term to capture efforts to strengthen the legitimacy of ASM, is at a critical juncture where the disruption brought about by the global pandemic could yield new, vibrant and promising measures to further support the growth and sustainability of this important global productive sector.

### 1. Introduction

It is now more than a year into the global COVID-19 pandemic. During this time, we have come to understand COVID-19 not only as a worldwide public health concern but also the cause of an international economic crisis that could surpass the global financial crisis of 2008–2009. Recent calculations by the World Bank indicate that COVID-19 will likely cause the first increase of global poverty since 1988, pushing 70 to 100 million people into extreme poverty (Mahler et al.,

2020). Containment and mitigation measures are necessary to limit the spread of the virus and save lives. However, this comes at a cost as shutdowns imply a reduction in economic activity.

These human and economic costs are likely to be felt the most in developing countries. Here, COVID-19 will have an immediate and amplified impact on the poorest and most vulnerable regions. The impact on state income and surge of unemployment will likely lead to an increase in migration and a ‘distress-push’ (Hilson and Garforth, 2012) of workers into the informal economy, which represents 90 % of total

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<sup>1</sup> Partner organizations: Agere Treasures (Ethiopia), Alliance for Responsible Mining (Burkina Faso), Artisanal and Small Scale Mining National Federation of Mongolia (Mongolia), Terah DeJong & Sebastian Pennes (Central African Republic), GemFair (Sierra Leone), Harvard Humanitarian Initiative (Democratic Republic of Congo), IMPACT (Democratic Republic of Congo), Levin Sources (Democratic Republic of Congo, Mozambique, Uganda, Zimbabwe), Pact (Colombia-Afai Consulting, Kenya, Myanmar, Nigeria), Resources Consulting Services (Chad), Synergy Global Consulting (Democratic Republic of Congo-Innovation Hub for Research in Africa), University of Surrey (Ghana, Mali, Liberia, Sierra Leone, Malawi), University of São Paulo NAP-Mineração ‘Centre for Responsible Mining’ (Brazil), United Nations Development Programme (Ecuador), World Bank (Indonesia-Yayasan Tambuhak Sinta, Niger)

<sup>2</sup> Cobalt, diamonds, gemstones, gold, quarry stone, sand, tantalum, tin, and tungsten.

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employment in low-income countries (International Labour Organization, 2018).

One informal sector largely overlooked thus far in discussions on the impacts of COVID-19 is artisanal and small-scale mining (ASM). Given the staggering employment numbers—over 44 million persons across the globe<sup>3</sup>—and that, by and large, the individuals engaged in the sector work without formal recognition or rights, it is bewildering that few questions have been raised about the possible devastating consequences facing this segment of the global informal labor market. Perhaps more surprising about this omission is that many of the world's strategic metal supply chains for clean energy, information technology and jewelry rely on materials produced by artisanal miners. For example, ASM accounts for the global production of 20 % of diamonds, 25 % of cobalt (Banza Lubaba Nkulu et al., 2018), 20 % of gold and 80 % of sapphires (Weldegioris et al., 2018).

As debates turn to the precarious nature of the gig economy in developed countries, and more broadly, the global state of formal and informal labor markets during this time of crisis, it is timely to consider how ASM will fare and where opportunities for new approaches to formalization may be emerging.

## 2. Early days

As early as March 2020, anecdotal reports and some news stories were trickling in about the impacts of the global halt on travel (and by consequence movement of goods) on strategic mineral supply chains, and the miners who labor in the informal mining sector. In Choco District, Colombia, the sudden closure of gold buying shops was reportedly leading to food insecurity. In the words of one woman: “With the closure of all the local gold shops...the real threat is not the COVID-19 virus but dying of hunger (Porter, 2020).” Similarly, reports were emerging from West African gold-producing countries of temporary bans on mining or suspension of movement between mining areas and the capitals, leading to a constriction of the in-country supply chains and a significant drop (upwards of 40 %) of the typical gold price being offered to miners (Reid and Lewis, 2020). Speculation rose that in the vacuum of traditional or legitimate buyers, miners would turn to the illicit market, further cementing terrorist organizations in fragile areas of Africa, such as the Sahel (Hunter, 2019). As miners struggled to maintain footholds at their mine sites, the need for protective gear and safe washing stations emerged. In Zimbabwe and southern Democratic Republic of Congo, reports detailed efforts by mining cooperatives to put these measures in place against the odds of limited local supplies. However, scattered stories, such as the ones illustrated here, were few and far between. Imperative was the need for a more accurate and comprehensive picture of the situation, should development partners wish to respond rapidly and accurately to the looming crisis in ASM communities.

## 3. The research project

Crises lay bare the cracks and fissures which exist in

<sup>3</sup> See Delve: [www.delvedatabase.org](http://www.delvedatabase.org) (Accessed Feb 1st, 2021)

systems—whether households, societies or organizations. Crises can also present opportunities for positive disruption and problem-solving. In the case of the present global pandemic, the World Bank, along a range of development partners,<sup>4</sup> has set out to understand how COVID-19 is influencing the development trajectories of select ASM communities.<sup>5</sup> In particular, as a group of researchers and practitioners, we were motivated to provide rapid, evolving snapshots of how COVID-19 responses were impacting the ability of artisanal and small-scale miners to work and the consequences these possible restrictions were having on their livelihoods. The development objective is to inform potential policy and programming responses under discussion by donors and multilateral organizations.

By way of a standardized short questionnaire administered by telephone, researchers conducted rapid surveys on a bi-weekly basis with miners in ASM communities spread across 22 countries<sup>6</sup> and mining a total of nine minerals.<sup>7</sup> The questionnaire contained seven main areas of inquiry: (i) knowledge on COVID-19 and its prevention; (ii) access to work; (iii) food security; (iv) human security; (v) service delivery; (vi) supply chains; and (vii) recovery perspectives. In addition, key informant interviews were completed to draw out contextual information in support of the quantitative results. More than 3400 responses were gathered over the full data collection period. The full data set is available on the Delve website (Delve, 2020b).

The survey was conducted over five reporting periods.<sup>8</sup> Never before had the ASM sector benefited from such an extensive, and coordinated global data gathering exercise. Not only was the reach of the survey exceptional, but it also demonstrated the appetite and possibility for large-scale, rapid and coordinated data collection exercises for the ASM sector. Organizations participated in various ways, with some self-funding the in-country data collection exercises<sup>9</sup> while others brought additional resources to the table.<sup>10</sup>

## 4. Findings

This section of the viewpoint piece shares some of the most significant results from the global survey, which, have important implications for discussions on the Sustainable Development Goals (SDGs) and ASM.

### 4.1. Knowledge on COVID-19

Across the 22 countries, when combined, over three-quarters of

<sup>4</sup> Partner organizations: Agere Treasures (Ethiopia), Alliance for Responsible Mining (Burkina Faso), Artisanal and Small Scale Mining National Federation of Mongolia (Mongolia), Terah DeJong & Sebastian Pennes (Central African Republic), GemFair (Sierra Leone), Harvard Humanitarian Initiative (Democratic Republic of Congo), IMPACT (Democratic Republic of Congo), Levin Sources (Democratic Republic of Congo, Mozambique, Uganda, Zimbabwe), Pact (Colombia-Afai Consulting, Kenya, Myanmar, Nigeria), Resources Consulting Services (Chad), Synergy Global Consulting (Democratic Republic of Congo-Innovation Hub for Research in Africa), University of Surrey (Ghana, Mali, Liberia, Sierra Leone, Malawi), University of São Paulo NAP-Mineração ‘Centre for Responsible Mining’ (Brazil), United Nations Development Programme (Ecuador), World Bank (Indonesia-Yayasan Tambuhak Sinta, Niger)

<sup>5</sup> See <https://delvedatabase.org/news/delve-covid-19-impact-reporting-initiative-begins> (Accessed July 21st, 2020).

<sup>6</sup> Ibid.

<sup>7</sup> Cobalt, diamonds, gemstones, gold, quarry stone, sand, tantalum, tin, and tungsten.

<sup>8</sup> Reporting Periods: 1 (June 1–12), 2 (June 13–26), 3 (June 27–July 10), 4 (July 11–24), 5 (July 25–31)

<sup>9</sup> Such as such GemFair in Sierra Leone, IMPACT in the Democratic Republic of Congo, USP Centre for Responsible Mining in Brazil, UNDP in Ecuador

<sup>10</sup> Such as the Organization for Economic Cooperation and Development (OECD) in the Democratic Republic of Congo and Burkina Faso, and Levin Sources in Mozambique.

respondents felt very informed (48 %) or somewhat informed (33 %) about COVID-19. In each reporting period, over 90 % of all respondents said that they had heard messages explaining what COVID-19 is and how to protect oneself. As reported by over 80 % of respondents, the principal medium of communication by which messaging was received was radio, followed by word of mouth. These findings demonstrate that even remote, rural mining areas have been well-targeted by government efforts to sensitize populations on prevention. It also demonstrates that peer-to-peer messaging is a very useful means to encourage behavior change in these communities. Some countries reporting on levels of awareness significantly improved over the reporting periods, with Indonesia,<sup>11</sup> Central African Republic and Niger having the largest percentage increases. In the case of the Central African Republic, the very positive increase in level of awareness can be partly explained by the Ministry of Mines' extensive communication campaign, rolled out in the spring 2020.

Amongst respondents, wearing face masks and washing hands were the most commonly-cited methods to prevent contracting COVID-19. Awareness of these two preventative methods was high across all reporting periods though their implementation was not as high. Still, over 60 % of respondents globally in each reporting period stated they were implementing preventative measures at mine sites. Countries where the respondent group showed significant interest in taking additional measures were Colombia (100 %), Kenya (73 %), Malawi (96 %), Niger (82 %), Uganda (95 %), and Zimbabwe (100 %). Amongst these countries and their respondents, the major barriers to implementing additional measures were indicated to be a lack of available funds to purchase supplies and lack of available supplies locally.

Over the reporting periods, for those respondents not implementing preventative measures at mine sites there was a significant decline in their belief that preventative measures were not necessary. This meant that, as the crisis continued, respondents became further convinced that prevention was important. Most respondents not implementing measures provided a variety of 'Other' responses, including difficulty working with a face mask, lack of authority onsite, and general belief the virus was not locally present. Notably, amongst the respondent group, there remained a consistent majority that held the view that they were not likely or not at all likely to get infected from COVID-19.<sup>12</sup>

Lastly, more than half of respondents for each reporting period did not feel that, should they fall ill, they had adequate access to healthcare. In several countries, over 80 % of respondents in the fifth reporting period felt they did not have access to adequate healthcare: Mali (100 %), Myanmar (100 %), Chad (92 %), and Colombia (84 %). Such findings point to lack of health infrastructure available in many of these mining areas, and should, therefore, guide programming responses to close these human capital gaps. Only in Indonesia and Uganda did over 80 % of respondents in the fifth reporting period feel they would have access to adequate healthcare.

#### 4.2. Work

The survey equally sought to understand how men's and women's access to work changed, if at all, during the crisis. At a global level, no significant gender gap was noted in how men's and women's access to

employment changed over the reporting periods. In fact, changes in access to employment remained relatively steady across all reporting periods.<sup>13</sup> Countries in which there were high levels of respondents indicating decreases in the presence of women and men<sup>14</sup> at mine sites were Burkina Faso, Ethiopia, Kenya, Malawi and Zimbabwe. Similarly, across the 22 countries over the course of the survey period, men and women's role did not change significantly. For instance, during the first reporting period, 48 % of female respondents stated no change in access to employment compared to 63 % during the final reporting period. Similarly, during the first reporting period, 52 % of male respondents stated no change in access to employment at sites compared to 67 % during the final reporting period. In the cases where men and women reported facing changing circumstances change at sites, the top reason given for both male and female respondents was a decrease in the number of hours worked. These results suggest that at the global level, there has been very little gendered impact on male and female miners' access to work.

#### 4.3. Human security

Across the 22 countries, and over the course of the survey period, the majority of respondents stated the security situation in their mining community had remained the same as prior to COVID-19.<sup>15</sup> There are, however, considerable variations in security when the data are disaggregated by country with causes of insecurity varying greatly across countries. For instance, in Central African Republic, armed groups were identified as the main cause of insecurity, whereas in Brazil, it was government entities.

Ethiopia was the only country to have a majority of respondents across all reporting periods indicate an increase in insecurity. Respondents attributed this to illicit mining activity and a range of 'Other' factors, including increased criminality related to lack of employment and other domestic social unrest in June and July 2020 (Meseret, 2020). Interestingly, Niger, where concerns over insecurity in mining areas has been quite high, reported no negative change in security. Some 98 % of Niger miner respondents during the fifth reporting period (July 25–31, 2020) stated that insecurity has remained the same as prior to COVID-19, with 68 % responding that they consider their mining areas secure and another 23 % responding that their mining areas are very secure.

Five countries had response data that suggested a decrease in insecurity when compared to pre-COVID levels. Indonesia, Mozambique, Nigeria, Sierra Leone and Uganda had the majority of respondents from each reporting period indicate that insecurity had decreased or greatly decreased. This decrease in insecurity may be attributed to government restrictions put in place to limit in-Country travel as well as quarantines and curfews that may have limited conflict and criminality (Oktavianti, 2021). Further research at the country level is needed to understand these potential dynamics.

#### 4.4. Food security

During the early stages of the COVID-19 pandemic, food security was

<sup>13</sup> 46–51% of respondents for reporting periods 2 through 5 indicated the presence of female stayed the same and between 37–51% of respondents stated that the presence of men at mine sites has remained the same since before COVID-19. Respondents indicating a decrease in the presence of women at mine sites was between 36–42% for all reporting periods and for the presence of men the range was between 40–50%.

<sup>14</sup> Defined as >75% of respondents stated presence of women compared to pre-COVID period 'decreased' or 'greatly decreased'

<sup>15</sup> Response data aggregated at a global level found that between 53% and 62% of respondents indicated that insecurity had stayed the same across reporting periods 2–5.

<sup>11</sup> From 26% to 61%

<sup>12</sup> For global respondent data between 1st and 5th reporting period between 62–70% of respondents thought they were not likely or not at all likely to get infected.

severely impacted in mining areas surveyed with up to 76 % of respondents indicating a decrease in available food in the first reporting period. Over the data collection periods, 42 % of total respondents reported food availability had decreased. This suggests that ASM communities experienced initial shocks as global movements were restricted but that as the crisis prolonged, the flow of goods and opportunities for employment normalized to a certain degree. This is supported further by a second question posed related to food security where over the course of the reporting periods the level of respondents reporting a resumption of pre-COVID levels of food grew from 20 % to 50 %.

Respondents indicated that the top causes of decreased food availability were price inflation of basic food staples and a reduction in household income. Skipping meals was reported in just under 20 % of respondents across all reporting periods. At the country level, Burkina Faso, Chad and Kenya were the outliers, with over 30 % of respondents stating they had to skip meals on a weekly basis.

#### 4.5. Service delivery

Less than a quarter of respondents surveyed across the 22 countries had received any services to alleviate impacts from COVID-19 measures. Hence while governments were quick to sensitize communities about the threat of COVID-19, few have delivered practical services to address impacts. At the country level, Brazil, Colombia, Indonesia and Sierra Leone were the only countries in which greater than 50 % of the respondents stated they had received services in response to COVID-19 across all reporting periods. For those limited respondents who had received support, roughly half of services were delivered by governments while the other half were delivered by a combination of civil society, international organizations and local associations. The top two items delivered were food rations and masks followed by disinfectant and cash. In Brazil, the mining cooperatives provided miners with food assistance, masks and COVID-19 tests to vulnerable community members. In Sierra Leone, GemFair, a pilot program of De Beers to source ethically-sourcing diamonds from artisanal miners, delivered emergency food aid, protective equipment and public health messaging to local communities surveyed in the data collection exercise (GemFair, 2020).

#### 4.6. Supply chains

At the country level, and across all reporting periods, 20 of the 22 countries surveyed had a majority of respondents indicate that COVID-19 had affected their ability to work in the mines. Government restrictions asking individuals to stop work and constricting access to mining sites were the most disruptive measures impacting miners' access to sites in the first two reporting periods. The two country exceptions were Ghana and Myanmar where starting in the second reporting period a majority of respondents indicated that COVID-19 had not impacted their ability to do work in the mines. In Myanmar, the government eased lockdowns restrictions in mid-June 2020 which facilitated the return of economic activity in the mining regions surveyed (Thulayphaw, 2020). Global data suggest that after June 26, restrictions started easing, giving way to two further factors impacting miners' ability to operate under pre-COVID-19 conditions. These two factors were the lack of financing to keep operations going and the inability to sell minerals at the desired price. In Myanmar, financing remained a key challenge for operators as lost capital during lockdown has significantly impaired mine owners' ability to cover costs and invest in restarting operations. At some sites, the lockdowns were so damaging that additional site preparation measures had to be undertaken to resume mining. These additional works came at a cost to operators.

As suspected, COVID-19 has had varying impacts on ASM operations based on the mineral mined and, by consequence, its global supply chain structures. For instance, gold and stone aggregates have had the most fluctuating impacts depending on the country and the point in time with

respect to the crisis. Gold and stone aggregates have exhibited the greatest variability in price offered and have shown the greatest differences on ability to sell on the market. In the first three reporting periods, globally aggregated data for gold miners indicated that it was more difficult to sell gold and prices were lower than pre-COVID times. However, in the final two reporting periods, gold prices were reportedly higher than pre-COVID rates and ease of selling returned to the same level as before the crisis. This rebound may be linked to the record rise in the international gold price, as investors continued to rely on gold as a stable asset during the pandemic, presenting supply chain actors a lucrative market opportunity sufficient to restart buying. At the country level, the exceptions to this trend were in Uganda, Zimbabwe and Colombia, where it remained more difficult to sell gold. Furthermore, in Mali and Uganda the gold price remained lower than before COVID-19 for greater than 75 % of respondents in the final reporting period. For stone aggregate miners, data from Ghana and Uganda was collected. In Ghana respondents reported the price being offered was consistently split between the same price or an increase in price compared to pre-COVID-19 across all reporting periods. For miners in Uganda reported price was same or lower than prior to COVID-19 across all reporting periods. Stone aggregate markets are most commonly driven by domestic consumption, contributing to local infrastructure development. Further research is needed to understand local market dynamics contributing to these variances.

For other minerals surveyed (diamonds, colored gemstones, and cobalt) across all reporting periods, respondents consistently indicated it was more difficult to sell minerals and prices were lower than pre-COVID times.

#### 4.7. Recovery perspectives

Overwhelmingly, when asked about needs for recovery, the top requests were financing and access to capital to restart operations. At a global level for each reporting period, greater than 47 % of all respondents prioritized financing as the most necessary intervention to restart or improve operations after the crisis. Mongolia, Mozambique, and Myanmar were the only countries where a non-financing response was prioritized by the majority of respondents across the majority of reporting periods. For Mongolia and Myanmar, 'Support with licensing and regulatory requirements (including customary and surface rent fees)' was rated slightly higher than financing. In these context, benefits of formalization of operations and regulatory compliance presents advantages to enhancing operations. For instance, In Myanmar, the qualitative data revealed that miners deal with ethnic armed forces that claim informal taxes on top of government taxes. In addition, miners struggle to get the necessary licenses due to corruption. These governance challenges raise significant barriers to safety and profitability for artisanal and small-scale operations hence their response indicating a preference for support with licensing and regulations over financing. In Mozambique, however, respondents prioritized 'Access to tools and equipment' and support with licensing over financing.

At the global level, the second and third most cited requests were for 'Access to tools and equipment' and 'Support with licensing and regulatory requirements'. Of the options presented to miners, 'Access to protective equipment' was the lowest ranked option<sup>16</sup> for the final three reporting periods. This finding is consistent with previous studies (Nakua et al., 2019) that have noted use of personal protective equipment is limited amongst ASMs often due to a lack of awareness and the poverty-driven nature pushing participants into the sector. It is not surprising to see that miners believe the most beneficial interventions

<sup>16</sup> Options given to respondents to restart or improve operations included: Access to Personal Protective Equipment, Access to Tools & Equipment, Education and resources to implement safe mining practices, Financing, Support with licensing and regulatory requirements.

will focus on regaining (if not surpassing) their pre-COVID levels of production.

## 5. Preliminary reflections

Set against the backdrop of these initial findings from the global data collection exercise, what can be said about the impact the current crisis will have on ASM and its continued contribution to global development and more broadly, sustainability?

Despite greater permanency of ASM in rural settings, mining communities still remain largely under-served with respect basic human capital infrastructure. As noted in the first survey section on health, whilst miners had received some form of health prevention communication more than half were not confident that they had access to adequate health services should they fall ill from COVID-19.

Impacts of COVID-19 related restrictions in mining communities have not been particularly gendered. As women have not retreated significantly from the mine sites at present, this is the time to cement progress on key gender equity indicators such as equal pay, reduction in various forms of gender-based violence, and increasing women-led and women-owned mining entities.

Though men and women have felt the impacts of access to work equally, women have suffered from food insecurity more than men. As the crisis continues, attention should be placed on food provision to mining communities with an emphasis on female-headed and single, female headed-households. Beyond food relief provided in the initial months, community kitchens projects and agricultural support could buffer any further shocks if second waves of COVID-19 are to hit many of these countries. The Responsible Mica Initiative and the partnership between Virtu Gem and the Zambian Women in Mining Association are illustrative examples of the types of relief interventions in need at present.<sup>17</sup>

Impacts on human security have not worsened substantially, allowing efforts to promote responsible supply chains, free of conflict, to continue un-compromised. Yet, overall market declines may make responsible sourcing scheme unprofitable until mineral prices return to pre-COVID-19 levels. This gives impetus to continue the hard work to make global mineral supply chains more transparent and accountable. It gives rise to the opportunity to radically re-appraise the way in which supply chains have functioned to date, to modernize these trade chains, and to introduce new mine models where greater benefits can accrue to miners on the ground.

The dramatic impact on pricing and access to markets for diamonds and gemstones could spur innovations in disruptive mines-to-market solutions. Take, for instance, Virtu Gem or Moyo Gems<sup>18</sup>, two initiatives which, during COVID-19, have created virtual marketplaces for artisanal and small-scale miners to sell their product directly to end buyers, removing in some instances the need for in-country middle persons. These virtual marketplaces could revolutionize the enormous variability in pricing found in these specific trade chains, offering miners more bargaining power and further competition to sell their wares to the highest global bidder with much greater degrees of transparency.

Requests for financial support, tools and equipment, and licensing indicate that miners intend to remain working at mine sites. This further reinforces evidence over the last two decades that ASM is not a temporary stopgap economically in rural areas anymore (Hilson and McQuilken, 2014). Rather, it is an important livelihood outpacing more traditional livelihood activities such as agriculture and petty trade.

Formalization, a broad term to capture efforts to strengthen the legitimacy of ASM, is at a critical juncture where the disruption brought

about by the global pandemic could yield new, vibrant and promising measures to further support the growth and sustainability of this important global productive sector.

## Author statement

I hereby that the information contained in this viewpoint has been written and analyses by myself and my co-author Nathan Schneck.

## Declaration of Competing Interest

The authors declare no conflict of interest.

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<sup>17</sup> See Responsible Mica Initiative and Virtu Gem partnership with Zambian Women in Mining Association

<sup>18</sup> See Virtu Gem: <https://www.virtugem.com/> and Moyo Gems: <https://moyogems.com/>