

Making Mining Safe and Fair: Artisanal cobalt extraction in the Democratic Republic of the Congo

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This paper is an independent expert assessment based on the author's review of cobalt-producing mines in the Democratic Republic of the Congo (DRC). The goal of the assessment was to identify actions that could eliminate violations of human rights and the use of child labour in sourcing cobalt in the DRC. These findings are intended to inform future dialogue on human rights and child labour issues associated with artisanal small-scale mining (ASM) in the DRC, including consultations being led by the Global Battery Alliance.

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Executive summary

- “ Artisanal mining is a lifeline for millions of impoverished people in the DRC. We need to see companies working with the authorities to formalize it – make it safer, remove children, provide miners with a fair price.

Mark Dummett, Head of Business, Security and Human Rights at Amnesty International, quoted in *The Financial Times*, 28 May 2020¹



Global demand for cobalt, a key component of lithium-ion batteries used in consumer electronics and electric vehicles, is expected to grow fourfold by 2030.

More than 70% of the global production of cobalt takes place in the Democratic Republic of the Congo (DRC), of which 15–30% comes from so-called artisanal and small-scale mines where independent miners use their own resources to extract the mineral.²

Sourcing cobalt from the DRC is linked to major human rights risks, which have been widely documented. The prevalence of artisanal and small-scale mining (ASM) in the cobalt supply chain

creates challenges for establishing responsible sourcing practices. This white paper assesses recent company approaches to formalizing ASM. Formalization of an informal industry is generally defined as the development of standards in line with basic human rights principles and environmental standards. In the case of ASM, these standards include basic infrastructure, health and safety measures, and monitoring to assess compliance with these standards.

The insights from three ASM formalization projects stem from field research conducted in Kolwezi, DRC, in September 2019, with insights largely

“ Any efforts to develop responsible sourcing practices need to focus primarily on ASM operations

drawn from the Mutoshi site because it is the only running ASM cobalt formalization project. The main objective of analysing these formalization projects is not to assess the current effectiveness of the pilots but to inform the factors that would need to be put in place to make ASM formalization projects scalable and replicable, based on the limited sample of existing formalization projects.

The field research shows that the formalization of ASM is necessary. Fully examining lessons and best practices to inform a comprehensive assessment of formalization of ASM will require consultation

with all stakeholders, particularly those working in the DRC's mining communities. However, the research does not show that the model of ASM on a large-scale industrial mining (LSM) concession is the best or only model for formalization. If it is implemented well, formalization can address key human rights concerns relating to cobalt mining, including child labour and health and safety issues. Yet today there are no common standards to formalize ASM, which hampers the establishment of responsible ASM in the cobalt market and the likelihood of ASM cobalt from responsible sources entering the formal supply chain.

Key findings

1. ASM production constitutes 15–30% of total cobalt production in the DRC.³ Human rights risks, including child labour, are greatly elevated in ASM operations. Yet ASM is often the sole form of livelihood for those in destitute local communities. Any efforts to develop responsible sourcing practices need to focus primarily on ASM operations, both on ASM sites and ASM activities that take place within large-scale industrial mining (LSM) concessions. Companies sourcing cobalt from the DRC must implement sustainable sourcing strategies that include the establishment of clear labour standards in line with the DRC's mining code and a system to implement those standards. This formalization of ASM sites on LSM concessions will require a range of actions including: 1) fencing off mining sites with access controls; 2) introducing safety measures, as well as the mechanical preparation of open pits that do not require deep pits or tunnel constructions; and 3) involving one or multiple independent cooperatives of artisanal miners to oversee the implementation of safety standards and negotiations with the mining company.
2. The formalization of ASM practices is an essential step to address the widespread human rights problems that are prevalent today at Congolese mining sites. The jobs and income created on formalized ASM sites can also help reduce extreme poverty, which is a root cause of child labour. The formalization of ASM will produce a number of social and economic benefits for local communities. These may include: 1) creating stable employment for adults, which will reduce the need for extra income from child labour and provide funds for school fees;⁴ 2) ensuring safer working conditions and reducing the number of accidents through capacity- and skills-building training for miners; 3) achieving higher productivity levels and generating higher income for miners as a result of better-organized operations; 4) promoting female employment and respect for women across a range of mining tasks, including the best-remunerated ones; 5) improving the health of miners and community members; 6) creating new business opportunities in response to higher output levels and higher demand for goods and services; 7) ensuring effective and transparent representation of miners' labour rights through the formation of cooperatives that are empowered to negotiate prices.
3. Formalization will also require the development of industry standards, performance metrics and an implementation system that includes routine monitoring and evaluation of mining operations to ensure compliance with these standards. The standards must respond to industry needs and address the very specific human rights and environmental impacts of each different operational site. Regulatory agencies, industry associations and multinational companies have all publicly recognized the validity of the ASM sector as an important revenue generator for impoverished communities. Also, the DRC government has developed a range of legal instruments, regulations and guidance on ASM formalization.⁵ A common standard developed through a multistakeholder process needs to reflect and reinforce DRC law and help to build capacity for its enforcement.
4. In addition to the formalization of ASM sites, it is important to understand the multidimensional root causes of persistent human rights issues in the DRC's mining context. Addressing underlying socioeconomic causes related to extreme poverty, food insecurity, lack of social protection systems and an underinvestment in affordable education and health services requires specific attention. In addition to building basic infrastructure (schools and day-care facilities), social development programmes must build capacity in the community by including programmes that enhance and diversify the miners' economic opportunities such as apprenticeships, financial literacy courses and microloan programmes. Comprehensive remediation strategies need to be developed in collaboration with the DRC government and with supplemental funding from the international community.⁶

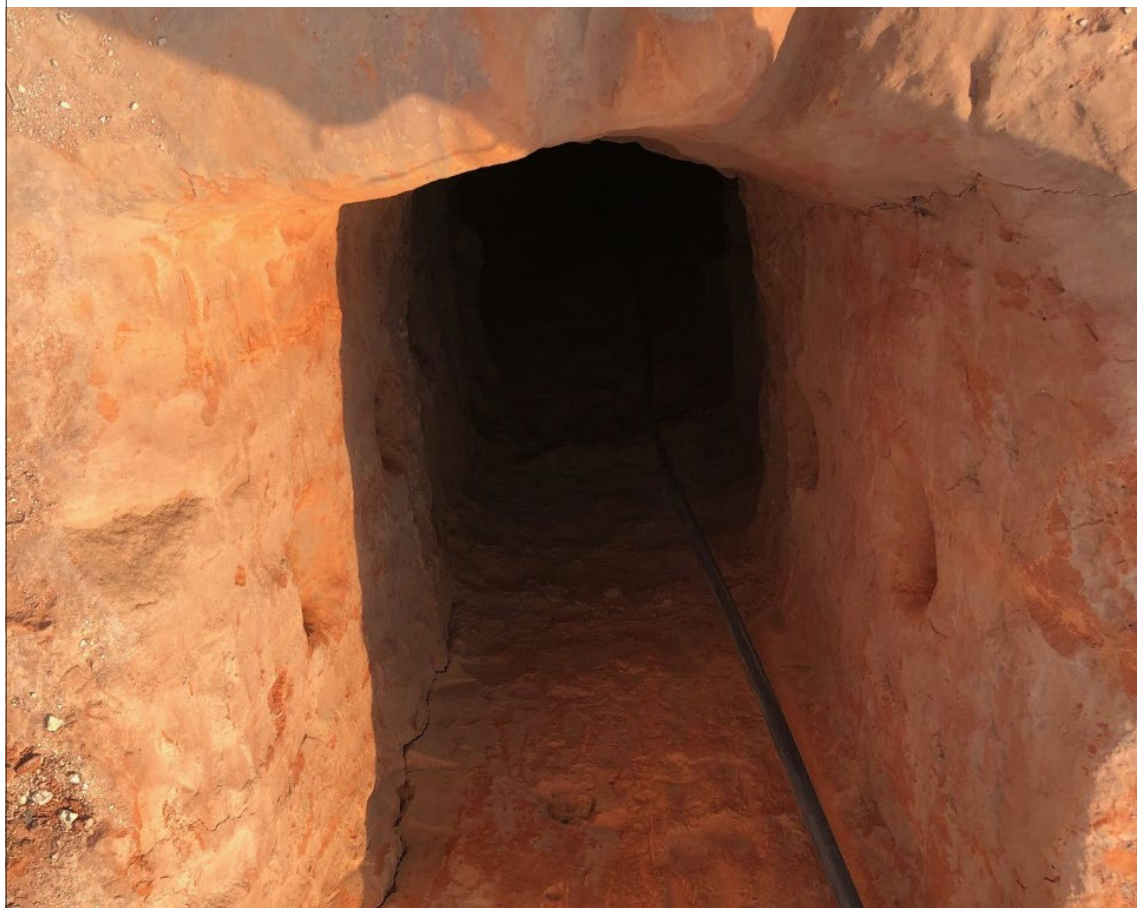
Introduction: ASM as a business reality in the DRC

🔊 The production of cobalt from ASM sites in the DRC represents the second-largest cobalt-mining sector in the world after LSM production in the DRC

Approximately two-thirds of all global cobalt production takes place in the DRC, the location of half of the world's cobalt reserves. Other cobalt-producing countries each account for less than 10% of global production and are unlikely to fully cover the rising demand for cobalt expected in the coming years. Recent projections by the European Commission and the Global Battery Alliance forecast a fourfold increase in cobalt demand before 2030.⁷ This growing demand means that companies reliant on lithium-ion batteries will need to source cobalt either directly or indirectly from the DRC. The development of potential new battery technology that reduces or entirely eliminates cobalt content from batteries will take time to develop and scale. Many experts estimate that it will take about 10 years to achieve this.⁸ Battery mineral recycling technology is also being developed and may eventually help to meet the global demand. Yet until these changes occur, the DRC will remain the key sourcing country for cobalt. Companies reliant on cobalt need to address questions about their responsible sourcing strategies from the DRC.

ASM is a business reality in the Congolese cobalt supply chain. An estimated 20–30% of cobalt production in the DRC currently takes place in artisanal mines in which minerals are extracted using basic tools and typically without the help of machines.⁹ **The production of cobalt from ASM sites in the DRC represents the second-largest cobalt-mining sector in the world after LSM production in the DRC.** Cobalt extraction through ASM therefore presents an important development opportunity for the DRC, on the condition that responsible practices can be established.

The population of the DRC is growing very quickly and the Organisation for Economic Co-operation and Development (OECD) estimates that more than 80% of the population is underemployed or unemployed.¹⁰ The country does not have a widely diversified industrial sector. Companies that extract cobalt on LSM sites typically rely on heavy machinery and create far fewer jobs than ASM mines, which are often the only source of income for impoverished communities. As a result, even at large mining sites



Right: Illegal artisanal cobalt mine

closed off for industrial mining, ASM remains a common practice. In such cases, ASM can occur in a variety of forms – for example, where individuals or groups of individuals: 1) covertly enter and extract ore from pits or stockpiles; 2) are tolerated by mine owners in the margins of operations; and 3) are accepted and contribute to mine production.

According to estimates of the provincial mining minister of the copper- and cobalt-rich Lualaba province, there are between 150,000 and 200,000 artisanal miners in Lualaba alone.¹¹ Creating decent employment opportunities for this ASM community would have a positive impact on the socioeconomic development of the region. It also would address an increasingly pressing security question arising from tensions between traditional ASM communities that struggle for land access and foreign mining companies that engage in LSM.¹²

Faced with these challenges, among others, some companies that require cobalt to produce their goods are avoiding the DRC. BMW, for example, decided to source cobalt from Morocco and Australia to be used in the production of electric vehicles from 2020 onwards.¹³ Tesla has reduced its average cobalt use by more than 60% in the past seven years, and the company recently announced that it would start using cobalt-free lithium-iron phosphate (LFP)

batteries to build its new car models.¹⁴ Following this announcement, however, Tesla signed a long-term supply deal with the world's largest mining company, Glencore, for 6,000 tonnes of cobalt a year (around 4% of global output).¹⁵ This decision by Tesla suggests that, despite its efforts to develop cobalt-free battery technology, electronics and vehicle manufacturers will continue to rely on Congolese cobalt for the foreseeable future. Generally, downstream companies are taking a greater interest in their supply chain than ever before by asking battery makers questions and, for the first time, looking to cut out the middleman and buy direct.

From a human rights perspective, curtailing mining activities in the DRC would severely harm the local population. Mineral extraction accounts for 90% of the country's exports and constitutes a core element of the Congolese economy.¹⁶ More than 2 million Congolese rely on ASM for their livelihood and they in turn support about five times as many people.¹⁷ Globally, more than 40 million people are directly engaged in ASM compared to 7 million in LSM.¹⁸

In light of the rising demand for cobalt, the DRC's unparalleled cobalt resources and its reliance on the cobalt mining industry, solutions to mitigate the human rights risks in the Congolese supply chain need to be developed now.

Below: On street market: tools for mining (a complete set costs a maximum of \$50)



Human rights risks linked to the Congolese cobalt mining sector

“ Child labour is a systemic issue in the region

For years, human rights advocates and others have documented child labour and other human rights concerns related to cobalt mining in the DRC. In February 2016, Amnesty International published a report that detailed widespread child labour, health and safety risks for miners.¹⁹ The report triggered multistakeholder initiatives such as the Global Battery Alliance. In recent years, several large automotive and electronics brands such as BMW, Ford and IBM have launched responsible sourcing and tracing pilot projects to drive transparency in the extraction of raw materials.²⁰

In the aftermath of Amnesty's report, many international companies focused on the use of child labour, viewing it as a red flag compliance issue in their supply chains. In 2014, UNICEF estimated that 40,000 children were involved in mineral extraction in the DRC.²¹ The Center for Effective Global Action at the University of California, Berkeley published a policy report in 2017 after conducting large-scale surveys in 150 ASM communities; the report estimated that more than 4,700 children from ASM communities worked in the mining sector, only about half of whom were 15 years of age or older.²² An investigative report by Harvard adjunct lecturer Siddharth Kara in 2018, based on a visit to 31 artisanal mining sites in the DRC, estimated that there were 35,000 child labourers.²³ Most recently, in an interview in *The Guardian* in January 2020, Mark Dummett of Amnesty International reiterated the presence of children working in cobalt mines around Kolwezi, where the three pilot projects discussed in this white paper are located.²⁴ Other recent studies on the number of child labourers in the production of cobalt in the DRC are provided in the endnotes section.²⁵

There are three principal reasons for the large number of children working or present at Congolese mining sites.²⁶ First, smaller children often have no guardians other than their working parents and therefore must accompany their parents to mines and work alongside them.²⁷ Second, the places where the miners live and the sites where cobalt is mined are not clearly separated and children play everywhere, including at worksites. Third, child labour is a systemic issue in the region because it is cheaper than adult labour and, with

weak enforcement of laws against child labour, the likelihood that companies will be held accountable is low.²⁸ From the perspective of child labourers, the reasons to work in Congolese mining concessions are many: the need for supplemental income from child miners in large families; child-headed households where children have to provide for themselves due to parental death, divorce or illness; young mothers who are considered adults and need to care for their own children; and peer pressure on older children who decide to work to have discretionary income.²⁹

The continued pressure by activists and growing attention to child labour issues in the media have increased the need for collective action to address this problem. In December 2019, a lawsuit was filed against large technology companies on behalf of 14 Congolese families who say their children were killed or maimed while mining for cobalt. The lawsuit, filed in a US federal district court in Washington, DC, claims that defendants Apple, Dell, Google, Microsoft and Tesla “knew that DRC's cobalt mining sector is dependent on child labour which included hazardous work such as tunnel digging in primitive cobalt mines”.³⁰ It also alleges that these companies have aided and abetted in the death and serious injury of children who were working in their supply chain. As of June 2020, the lawsuit is at the preliminary pleadings stage.

There have been several company initiatives aimed at improving working conditions in the cobalt supply chain and ensuring the safe and secure delivery of cobalt to the market. China's largest cobalt producer, Huayou Cobalt, and one of the world's leading commodity trading firms, Trafigura, have each initiated pilot formalization projects in the DRC to experiment with business models that integrate ASM activities in LSM concessions. A third, more recent project was set up by the German Agency for International Cooperation (GIZ) and is financially supported by BMW, BASF, Samsung SDI and Samsung Electronics.

This white paper examines each of these pilot projects and outlines their similarities and differences, and identifies key characteristics that can be useful in building future ASM formalization projects.

ASM formalization projects in Kolwezi

ASM in the cobalt supply chain is a business reality in the DRC and requires a more formalized oversight system to address child labour and other chronic human rights challenges

This white paper focuses primarily on ASM formalization projects in Kolwezi, which is the capital city of the Lualaba province in the former Katanga region of the DRC. This is in the heart of the Congolese copper belt, one of the most important production hubs for copper and cobalt mining in the world.

The paper presents evidence in support of the formalization of ASM cobalt production, which is generally understood by downstream companies as the development of industry standards in line with basic human rights principles and environmental standards. It includes the creation of basic infrastructure and support to enable the implementation of such standards in ASM sites, including routine monitoring to assess compliance with these standards.

The three projects analysed here involve cobalt mining in the communities of Mutoshi, Kasulo and Kisote. These formalization efforts aim to ensure respect for basic human rights. Comparing the projects and identifying the factors that enable a successful formalization of ASM will indicate how these pilots can be sustained, scaled and replicated.

The primary focus is on the Mutoshi mining project, which is the most advanced active formalization project at a cobalt mining site in the region.³¹ Access to the site at Mutoshi to carry out independent research was facilitated by: Trafigura, a Swiss-based commodity trading company; Pact, a non-profit organization that Trafigura appointed for the implementation of its pilot project at the Mutoshi mine; Chemaf, the operator of the mine; Service d'Assistance et d'Encadrement des Mines Artisanales et de Petit Echelle (SAEMAPE), the Congolese government agency responsible for ASM regulation and training; and COMIAKOL, the worker cooperative on site.

In the past year, there have been several developments that reinforce the timeliness of addressing human rights risks in the Congolese cobalt supply chain. While the current low price of cobalt has drastically reduced the number of artisanal cobalt miners, this number is expected to grow as demand increases and causes a rise in prices. The “swing capacity” of the local community – farmers can switch to mining and miners from one mineral to the other – means that the number of artisanal miners will increase quickly with a rising cobalt price. Mitigating risks from ASM therefore requires solutions to be developed now, before larger numbers of miners return to cobalt mining without regulation.³²

The DRC government has begun to pay more attention to the need for greater oversight of ASM. In November 2019, it issued two new legal directives, which require that: 1) cobalt from artisanal production be kept separate from industrial production; 2) cobalt mined at ASM sites be exclusively sold to the government; and 3) a government oversight body be created to ensure decent working conditions at ASM sites. ASM products sold to the government will require certification by this oversight body. In June 2020, the DRC government announced that it would begin its state-controlled purchase of ASM cobalt by the end of the summer.³³ It remains to be seen how these government directives will be put in place. At the provincial level in Kolwezi, local government officials have already identified 40 artisanal exploration sites (each called a Zone d'Exploration Artisanal, or ZEA) that they want to open in the coming months. Analysing existing formalization projects can help the government as well as the companies that support these formalization efforts to build on key lessons from the initial pilots. An example of this is the Kisote formalization project.

On another front, in October 2019, the London Metal Exchange decided to allow the trade of only responsibly sourced minerals.³⁴ This will require companies to apply, among other requirements, the OECD Due Diligence Guidance for responsible mineral supply chains³⁵ by 2022 and reach full conformity with these standards by 2023.³⁶ This also creates incentives for companies to develop due diligence systems for their metal supply chains.

All of these developments add to the growing consensus among various stakeholders that ASM in the cobalt supply chain is a business reality in the DRC and requires a more formalized oversight system to address child labour and other chronic human rights challenges. Developing business solutions that address these risks has become a priority for many companies that are dependent on cobalt production. Civil society and development organizations such as Amnesty, Human Rights Watch and Pact share this perspective and see the formalization of this sector as the most effective first step in addressing child labour and other human rights issues affecting mining communities.³⁷ Furthermore, jobs on formalized ASM sites can provide decent income opportunities and safer workplaces.³⁸ In the many poverty-stricken communities, these jobs can reduce the need for children to help support their families by working as artisanal miners.

Scope and methodology of the situational analysis

There are three cobalt ASM formalization projects around Kolwezi, two of which had been in operation (Mutoshi and Kasulo) until decisions were made for their closure due to the COVID-19 pandemic.^{39,40} It appears that the Kasulo site is now closed indefinitely, as Huayou Cobalt announced in May 2020 that it had stopped sourcing from the site.⁴¹ The Mutoshi project has been on hold since March 2020, with project partners hoping to resume activities in the future. The project partners of the Kisote mine announced their intention to develop a formalization project on a ZEA (artisanal mining area) in September 2019, but, as of June 2020, the site has not become operational.

There are two models of formalization project. Under the first model, the mining company or its buyer executes an agreement with the cooperative on the site. This agreement grants the company an exclusive right to purchase all of the supply from that mining site and thereby confers the ability to largely control conditions on concessions and set standards for ASM. This is the case at Mutoshi and Kasulo, where the formalization projects are on the concessions of private, international, large-scale mining companies. Chemaf (Mutoshi) and Congo Dongfang International Mining (Kasulo) use earth-moving machinery to prepare the ASM site. The projects were initiated by the buyers (Trafigura at

Mutoshi and Huayou Cobalt at Kasulo) and there is close cooperation between buyers, the mining companies and the implementation organizations on the ground (e.g. Pact at Mutoshi). To legalize ASM activity on an LSM concession (the so-called hybrid model), clear contracts need to be put in place between the cooperatives and the mining companies, otherwise ASM exists in a legal grey zone. For Mutoshi and Kasulo, these contracts exist, but this is not the case for other sites. Critics of this model argue that there is a risk of abuse because of the power of the mining company in this relationship.

Under the second model, neither private LSM companies nor their foreign buyers have a direct role. Instead, the ASM site is set up at a ZEA that the DRC government has identified. As described below, there are plans to test this model for the first time in Kisote. Currently there are 40 ZEAs in Lualaba province with registered cooperatives for each site. ASM is a legal activity on these ZEAs. However, according to GIZ, digging has not started on any of the ZEAs yet because of uncertainty over whether there are any cobalt resources. No geological surveys have been conducted on the ZEAs and very few are close to large concessions with proven resources. The cost of a geological survey is estimated at \$1 million, which is a very high sum for any cooperative to pay.

4.A Mutoshi

The Mutoshi formalization project started in February 2018, initiated by Trafigura. Chemaf, the mining operating company, agreed to the project provided that Trafigura would support its implementation. Trafigura appointed Pact, a non-profit organization, to help implement workplace standards and to work alongside SAEMAPE, the government's ASM supervision body.

Pact consulted with five local mining cooperatives that the government proposed for the Mutoshi site. The local cooperatives are vital to the success of these formalization projects. In this largely informal context, they provide a consolidated institutional contact point for the mining companies and help to support the implementation of agreed standards.

COMIAKOL, the cooperative working at Mutoshi, is registered with regional and national government agencies. Having operated in the region for more

than 30 years, it has strong links to the local community and, together with Chemaf, it has developed its own management structures.⁴²

As part of the formalization process Trafigura and Chemaf have fenced off premises and controlled entry/exit areas. With the help of COMIAKOL, they registered more than 5,000 miners and distributed identity cards to them, which are in addition to the cards individuals are required to carry by law to demonstrate they are registered as artisanal miners. The photographic ID cards are not digital and copying them or passing them on to family members would not be difficult for individuals who look similar. While registration is a necessary step to formalization, the current system may require additional updates to be fully effective. The companies have adopted rules aimed at excluding children and (visibly) pregnant women from the site. The exclusion of pregnant women requires

the creation of alternative safe workplaces where women can earn an income while they are most vulnerable. At Mutoshi, COMIAKOL reported that a very modest fund to support pregnant women and women after birth was set up, but it could not be assessed how many women have benefitted from this financial support.

An investigative team of local researchers led by Harvard lecturer Siddharth Kara determined that the fence at Mutoshi does not prevent outside miners from selling cobalt into the project site, thereby potentially mixing the cobalt from the project with cobalt extracted at non-formalized ASM sites. The project partners at Mutoshi, however, denied that the fence is permeable and questioned what motivation there could be to sell cobalt into the project, given that Chemaf's prices are lower than those paid by public depots in order to recoup some of the cost of the project. Ensuring that cobalt from formalization sites is kept separate is a condition for establishing trust in the viability of a responsible cobalt production through ASM.

Trafigura and Chemaf provided every worker with personal protective equipment (PPE): uniforms, boots, glasses, helmets, masks and gloves. During the site visit for this white paper, most miners used some PPE but generally not masks or gloves. On-site Pact staff explained that some of the PPE had already worn out and needed replacing, and discussions between the project partners are ongoing over who will bear the cost for the replacement.

Chemaf had also opened the pits using earth-moving machines, which allows extraction to take place without dangerous tunnel constructions or deep pits. This mechanical preparation of mining sites improves worker safety and productivity. Under this new oversight system, new rules have also been enacted on alcohol consumption to prevent conflicts and accidents. Alcohol tests with a breathalyser are now conducted randomly and regularly by COMIAKOL.

COMIAKOL fully supports the efforts by Chemaf, Pact and Trafigura to implement ASM standards.

Furthermore, COMIAKOL has introduced formal and informal grievance channels. The cooperative appointed a female member to handle all complaints, including gender-specific requests related to funds reserved for mothers who request support for a two-week maternity leave.

Chemaf's general manager, Ghislain Yumba K., said that all of these reform measures are designed "to create a safe environment". He also pointed out that putting these measures in place is costly and "all these costs remain the same at a time when production is going down". What this means from his perspective is that "to make the project viable [they] need to have a minimum income". As cobalt prices have dropped, this means that the economic viability of the formalization project has become even more challenging.

While the project's infrastructure, such as overburden removal and PPE distribution, was clearly implemented at the time of the research trip to Mutoshi, other less visible aspects of the project (for example, the extent to which workers trust the grievance channels set up by the cooperative COMIAKOL or the extent of worker satisfaction in general with the work of COMIAKOL) could not be fully assessed. One indicator of success is the amount of turnover and, at Mutoshi, the attrition rate is very low. While alternative sources of livelihood in the Congolese copper belt are very limited,⁴³ at least some of the miners at Mutoshi have been working on the site for many years. Several of the female workers stated that they liked working at Mutoshi because they felt safe on the site. In addition, child labour on the mining site has been fully eliminated. A first socioeconomic assessment of the Mutoshi community found decreased rates of illness, injury and harassment of female miners.⁴⁴ Local critics such as Afrewatch attest to an improved safety situation at Mutoshi, but claim that there are neither economic nor social benefits for workers.⁴⁵ Clearly, further independent assessments are needed to comprehensively analyse the improvements in mining conditions delivered by the Mutoshi formalization project.

Below: The Mutoshi mining site





4.B Kasulo

Above: Kasulo mine

The Kasulo project started prior to Mutoshi in the concession controlled by CDM, a mining company and a subsidiary of Huayco Cobalt based in the DRC.

While there are many structural similarities to Mutoshi in terms of the project's set-up, there were also major differences regarding the implementation of standards. Similar to the physical structure of Mutoshi, a wall had recently been constructed at Kasulo, with clearly designated entry and exit areas to keep the site closed to the outside community. During the visit to Kasulo, it was not possible to make an assessment as to whether the wall was effectively keeping non-miners out of the mining site.

At the peak of production in 2018, Kasulo had approximately 14,000 artisanal miners working on the site. At the time of the research trip in September 2019, there were only 565 miners still active on the site, owing to the decline in the commercial demand for cobalt. There were also no women working in the mines because, according to local guides, there is widespread superstition that women bring bad luck for mining.⁴⁶ Some women were on the premises as food vendors, and other women were involved in washing and selling

the ore, but they were not typically present at the extraction sites.

At Kasulo, there were open pits but also many tunnels. The working conditions in these tunnels do not meet international standards. Even if tunnels are only 10 metres deep, miners need to wear head lamps because they work in total darkness. Many miners also need to carry oxygen because of the low oxygen level in the tunnels. Work takes place for hours in very confined spaces. The construction of these tunnels often poses added dangers of collapse. While tunnel depth is limited to a maximum of 10 metres, miners are allowed to dig horizontally underground, which increases the potential for mines to collapse.⁴⁷

Workers at Kasulo were not wearing PPE. A representative of Kasulo's cooperative stated that equipment had been provided to the miners, but they resisted using it. A CDM representative explained that some miners were selling their equipment on the market. Neither the representative of the cooperative nor the representative of CDM expressed concern about workers not availing themselves of the protections afforded to them by PPE.

Another challenge at Kasulo arose from the relocation of the village prior to the launch of the formalization project. Several non-profit organizations including representatives of Pact argued that the relocations were not problematic because communities themselves had already destroyed the foundation of roads and houses to dig for cobalt and, in any event, were paid compensation. But residents of Kasulo and local civil society organizations argued that the

compensation had been inadequate and that communities were moved to locations that did not have any infrastructure, leaving them without access to drinking water, health services or schools.⁴⁸ While a resettlement of the local community took place only in the case of Kasulo's project, it is important to highlight that relocations add significant complexity and cost to building formalization projects and can give rise to additional human rights challenges.

4.C Kisote

Known as "Cobalt for Development", the Kisote project has a budget of approximately \$5 million, which is exclusively financed by several major multinational companies, including BMW, BASF, Samsung SDI and Samsung Electronics. It is implemented by GlZ, with The Good Shepherd International Foundation (through local affiliate Bon Pasteur Kolwezi) and IMPACT (an NGO formerly known as Partnership Africa Canada, which focuses on transforming natural resource management and empowering communities) acting as implementing partners.

The aim of this project is to test how working conditions in artisanal mines can be improved through formalization and improve the living conditions for artisanal cobalt miners, their families and the neighbouring communities. The project partners have identified five areas in which they will assess performance. These are:

- Drinking water – preventing the contamination of drinking water in mining regions by new methods such as adding impermeable layers to ground around the open pits to prevent toxins from entering ground water.
- Air quality – preventing respiratory diseases through the use of PPE, such as mouth filters, and by watering dusty sites during the dry season.

- Tunnel security – increasing the security of digging activities by providing advice for tunnel construction, for example, tips on how to protect tunnels from rainwater and how to support horizontal tunnels structurally.
- Accident reduction – distributing helmets, gloves, protective glasses and security boots, and making their use obligatory.
- Eradication of child labour – stopping children from undertaking such tasks as transporting sacks of cobalt and washing ore, while providing free schooling as an alternative.

In September 2019, Cobalt for Development announced its intention to work at a ZEA next to Kisote, 20 kilometres south of Kolwezi. This site was under development by the Lualaba provincial government and several partners. A geological report – commissioned and financed by this government-led project – confirmed the site's likely economic viability based on initial drill data. However, external factors caused repeated delays and, as of June 2020, the government's ZEA development project has not been concluded and the site is still not operational.

Despite these unexpected challenges, the Kisote project plans to continue implementing its activities in the community. Until the mine site becomes operational, the project is engaging with various concession holders to negotiate authorizing existing ASM operations on their permits.

TABLE 1 | Comparison of cobalt formalization projects in Kolwezi

Key facts of ASM formalization projects in Kolwezi, DRC	Mutoshi	Kasulo	Kisote
Initiated by	Trafigura (buyer)	Huayou Cobalt (buyer)	GIZ, BMW, BASF, Samsung SDI, Samsung Electronics
Operated by	Chemaf	Congo Dongfang International Mining (CDM)	Tbd
Implemented on the ground by	Pact and COMIAKOL	CDM and cooperative	The Good Shepherd International Foundation, IMPACT
Concession held by	Chemaf	CDM	ZEA designated by local government
Number of workers allowed on formalization site at one time	5,000	14,000	Tbd
Cooperative on site	Yes, COMIAKOL	Yes	Yes, planned
Provision of personal protective equipment (PPE)	Yes, masks, hats, boots, uniforms and gloves are provided by Chemaf, but first generation of PPE has worn out	Yes, but the provided PPE was not used systematically and disappeared	Yes, planned
Enforcement of PPE at time of visit	Yes, miners wore PPE	No, miners did not wear PPE	N/A
Health, sanitation and hygiene measures	Yes, free provision of sanitary facilities, potable water and healthcare services	Yes, healthcare services on site	Yes, planned
Structural measures	Yes, fences	Yes, walls	Yes, fence is planned
Controlled entry and exit	Yes	Yes	Yes, planned
Registration of miners	Yes, ID cards	No clear registration process	Yes, planned
Work shifts	8 hours	No clear work shifts	Tbd
Preparation of open pits	Yes	Yes	Yes, planned, with local company providing earth-moving machines
Construction of tunnels	No tunnels permitted.	Yes, both vertical and horizontal, limited to 10 metres in depth	No tunnels permitted.
Advice on tunnel construction	N/A	Yes, provided by CDM engineers	N/A
Grievance mechanisms	Yes, informal mechanisms set up by COMIAKOL	Not assessed	Yes, planned
Turnover rate of miners	Low	No record	Tbd
Presence of female miners	Yes	No, only female food vendors	Tbd
Relocation of community prior to project	No	Yes	No

Lessons learned: key factors for successful implementation in ASM formalization projects

Based on the experiences of the ASM formalization projects at Mutoshi and Kasulo and the plans outlined for Kisote, there are several useful lessons that can help promote human rights in the implementation of formalized ASM at these and future sites. This section is largely based on the lessons from Mutoshi because it is the only running ASM cobalt formalization project to date. Fully

examining lessons and best practices to inform a comprehensive assessment of formalization of ASM will require consultation with all stakeholders, particularly those working in the DRC's mining communities. This section does not show that the model of ASM on a LSM concession is the best or only model for formalization.

5.1 Close coordination among all project partners and ongoing oversight of the project by the buyer

Devising and implementing a formalization project requires close coordination between buyer, mining company, implementation organization and communities through local cooperatives. To succeed, the project partners need to conduct a thorough analysis of the realities on the ground to establish the key risks to people and the environment. All consecutive project steps will demand exceptionally active and ongoing oversight and assistance.

For the Mutoshi project, Trafigura (the buyer), Chemaf, Kumi Consulting (a sustainability specialist acting as a third-party assessor) and Pact collaborate to set, implement and assess the extent to which sourcing expectations are being met. A spokesperson for Pact noted that Trafigura's project lead has visited the project frequently. Close involvement of the buyer was crucial. Trafigura presented the adoption of ASM standards as a business condition to Chemaf, while Pact ensured

the implementation of the standards on the ground, which were regularly assessed by Kumi Consulting. Trafigura's advocacy for the project with Chemaf after the COVID-19 pandemic will be essential to help ensure the successful continuation of the project. Effective implementation of standards, such as wearing PPE, requires close communication and mutual trust between parties active at the mine site and the local cooperatives. Because this trust and the capacity-building of cooperatives are key to success, mining companies and foreign aid agencies should invest in building them at the outset when they set up ASM formalization sites.

Capacity-building on safety, productivity and compliance at Mutoshi is carried out through a collaboration between technical experts employed by Chemaf, such as mine engineers, IT specialists, geologists and safety managers, and the other project partners – COMIAKOL and SAEMAPE – overseen by Pact.⁴⁹

5.2 Longer-term commitments to build sustainable ASM formalization projects

At Mutoshi, Trafigura executed a three-year marketing agreement with Chemaf whereby it would receive all cobalt hydroxide production from the site provided that Chemaf would meet Trafigura's responsible sourcing requirements. Formalization of ASM activities at the Mutoshi site became part of the agreement subsequently. For a commodity trading company, this is an unprecedented long-term commitment that enabled the formalization project at Mutoshi to launch and operate successfully. To advance the project, Trafigura built close relationships with local and national stakeholders, including government representatives, civil society organizations and ASM cooperatives and they consider this network as essential to the formalization project's success.

To date, there is neither an agreed ASM human rights standard nor any form of internationally recognized validation of the implementation of such a standard at ASM sites. As a result, many downstream buyers still refuse to source any cobalt from ASM sites. What this means in practice is that informal ASM sites operate without any basic human rights protections. Looking to the future, commitment by more buyers to buy products from formalized ASM sites will help to create a new understanding that ASM sites can be run according to basic human rights standards and that they can serve as development accelerators for poor mining communities. The success of this model will require cooperation among industry competitors and longer-term commitments.

5.3 Independence, legal status and governance capacity of local cooperatives

“Commitment by more buyers to buy products from formalized ASM sites will help to create a new understanding that ASM sites can be run according to basic human rights standards”

The recently enacted DRC mining law requires artisanal miners to become members of a cooperative in order to engage in legal mining activities in ZEAs.⁵⁰ The law also permits artisanal miners to mine legally on LSM sites under a subcontracting relationship with the LSM operator and thereby introduces the legal basis for a collaboration between LSM operators and artisanal miners.

Interviews with implementation partners at Mutoshi highlighted the critical role that the local cooperative COMIAKOL is playing. Because it has close ties to the community, COMIAKOL's engagement is crucial to shaping these standards and winning their acceptance by the miners. Identifying an organization that authentically represents the interests of the ASM community at each facility, and one that can operate independently, ensures that the interests of artisanal miners are integral to the project.⁵¹

At Mutoshi, COMIAKOL has been active on the site for many years and has very engaged and effective leadership. Many of those interviewed during the research trip view COMIAKOL's role as a major factor in the success of the project. COMIAKOL had no proper legal status prior to the start of the formalization project. According to Pact, registering cooperatives in the DRC can be an expensive, complicated and long process involving DRC government agencies at the provincial and national level. Registering COMIAKOL was successful thanks to the support it received from the implementation partners at Mutoshi. Allegations

that COMIAKOL was unable to negotiate a fair price with Chemaf could not be substantiated in the interviews. During the visit to the project, the head of COMIAKOL explained how he checks daily world market prices and negotiates with Chemaf in case its price does not reflect world market fluctuations. Daily prices are displayed in the entry and exit areas so that miners know the compensation they will be paid. The low cobalt prices in the past year have been challenging for all project partners at Mutoshi and raise questions over the project's sustainability. Generally, strengthening the leadership of cooperatives is relevant to ensuring that they remain independent of government influences and the interests of mine operators (if they operate on an LSM site) and truly work for the benefit of the miners and not for the interests of government officials or the mine operator.⁵²

To further clarify and strengthen the role of cooperatives that operate on LSM sites, legal subcontracting agreements need to be put in place between the owner of the LSM concession and the cooperative in line with the 2018 mining law. Currently, such contracts that fully legalize the ASM activity on the property of a foreign mining company have been put in place only at Mutoshi and Kasulo, while cooperatives elsewhere operate on this so-called “hybrid model” but are effectively illegal.⁵³ Formal contracts are in the interest of both parties because on the one hand they fully legalize the cooperatives' ASM activity while on the other they enable the mining company to outline the conditions for the cooperative to operate, including respecting standards.

5.4 Professional geological analysis and preparation of the mining site

ASM communities develop around locations with rich resources. At Kasulo, the discovery of highly concentrated cobalt resources resulted in a gold rush-like extraction of the mineral in the middle of an established village. At Mutoshi, artisanal miners have been active for several decades, originally digging for gold but also copper and cobalt. These mining locations are thus known for rich resources. Eventually, however, the resources will be depleted and new mining sites will need to be carefully assessed before new formalization projects are set up. If artisanal miners are digging for weeks without significant income, this could endanger the trust in all formalization projects. At Mutoshi, Chemaf geologists have conducted drilling to identify potential future sites on their mining concession for profitable ASM formalization projects; this is because the ore body of the original Mutoshi site is depleted and artisanal miners are seeking new mining areas.

Careful geological analysis is therefore particularly important for the many new ZEAs. Cobalt resources must be accessible close to the surface to avoid

too much earth moving, and the cobalt must have the right “grade” or quality. Cooperatives cannot afford the excessive cost of geological surveys. While cooperatives have already been registered for most ZEAs, artisanal miners represented by cooperatives are currently not interested in commencing work on these sites.

At Mutoshi, representatives of Chemaf explained that the ASM site’s location would also not lend itself to machine extraction. Apparently, the “grade” of cobalt there would not make it profitable to extract with machines. While machines can recover cobalt ore at a grade of 0.5%, the human eye can recover material at a higher concentration (i.e. around 1.5%). As such, ASM works well at Mutoshi. Furthermore, the site is an ideal location for a formalization project because it does not take away from the land that can be used for LSM, even as it provides profitable resource extraction for ASM.⁵⁴ For mining companies to identify such locations would be ideal for integrating future formalization projects on LSM sites.

5.5 Agreement on common ASM standards and a system of assessment

Currently, there are no widely accepted industry standards for ASM cobalt formalization projects and no independent body to monitor and assess standards once individual projects have been established. Yet the development of these standards and metrics does not need to start from scratch. The 2018 mining law can guide formalization and a future standard must build on these legal foundations and strengthen their efficacy. We can also learn from other ASM contexts where good methods have already been identified and draft ASM standards have been developed. For example, the Code of Risk-mitigation for ASM engaging in Formal Trade (“CRAFT”) outlines ASM standards generally, without a specific focus on any commodity or geography.⁵⁵ The Certified Trading Chains (“CTC”) approach of the BGR (German Federal Institute for Geosciences and Natural Resources) was developed to certify responsible mining practices and is particularly concerned with feasibility and impact in the ASM context.⁵⁶ The CTC has been implemented at pilots in Rwanda and the DRC. Further input for the operationalization of standards could come from comparative analysis of formalization projects in other mineral industries. One example is the Fairmined Standard, which was developed in the gold context to support sustainable

development of ASM communities engaged in the mining of gold and associated precious metals.⁵⁷ Most recently, the Fair Cobalt Coalition set out to define specific ASM standards for cobalt mining from the DRC.⁵⁸ Standard development for ASM in the cobalt context can benefit from these explorations and be adapted to the specific challenges of cobalt mining in the DRC.

The currently disparate standards and implementation levels observed at Mutoshi and Kasulo threaten to undermine the formalization idea because formalization has different definitions at different sites. ASM standards need to be developed that will define concrete operational measures applicable to all formalized cobalt mining sites and cover the most consequential human rights risks.

Once these common standards are in place, a system needs to be developed that will include independent inspectors assessing the sites and determining compliance with these standards. Audit reports need to be undertaken against a common industry standard using shared metrics and carried out by independent monitors to ensure the credibility of the process.

5.6 Preparation of basic infrastructure for formalized ASM sites

“ A key aspect of formalization is to control who enters and works on designated ASM sites

Formalization projects require minimum infrastructure to address gaps in mine safety and to promote health. Understanding that the size of ASM sites varies considerably and that smaller sites will not be able to set up the infrastructure elements outlined below, the following list outlines an ideal benchmark for larger formalized ASM operations:

A. Offices for cooperative, SAEMAPE, clinic, etc.

Preparing space for the cooperative, for the government oversight body SAEMAPE and for emergency medical services in case of an accident are important infrastructure elements that support the implementation of standards. Offices need to be provided, as is the case at Mutoshi, so that these agencies can conduct their work on site and basic health services in case of injuries are directly accessible.

B. Fencing/walling of the site and creating designated entry/exit areas where identity cards are checked

A key aspect of formalization is to control who enters and works on designated ASM sites. This aspect is most important to control for child labour or for pregnant women who should be banned from mining sites for health reasons. At Mutoshi, there is a fence; at Kasulo, a wall was constructed to separate activities on the mining site from the community life that directly borders the concession. In the past, accidents involving children reportedly often happened simply because the children were playing too close to dangerous mining sites.

While controlling who enters the mining site is certainly a necessary condition, it is also important to ensure that miners are free to leave at any time to prevent forced labour situations.

C. Preparation of open pits with heavy machinery

All three projects are semi-mechanized sites where ASM is facilitated by heavy earth-moving machinery that prepares open pits. At Mutoshi, there are exclusively open pits and no tunnels. Earth-moving machines create terraces. Digging is allowed to a maximum of 10 metres, at which point machines remove the earth to open the pit further. The open

pits are significantly less dangerous than tunnels. Also, the machines do the most labour-intensive work – namely, removing the top layer of earth and the waste material. An added benefit of the semi-mechanized method is that the cobalt extraction can start immediately, without miners having to dig deep in order to reach the cobalt. At Kasulo, open pits are also prepared for artisanal miners. Although it is not in operation yet, the Kisote project plans to employ a local company to provide earth-moving machines to prepare open pits and it will not allow the construction of tunnels on the site.

D. Installation of drinking water, sanitation, etc.

For health and safety reasons, toilets as well as drinking water access are provided at Mutoshi. There is also no rubbish on the site, which represents a stark contrast to the environment outside of the fence. These measures contribute to a cleaner work environment and better health and safety conditions for the workers.

E. Protective equipment

At both the Mutoshi and Kasulo formalization sites, PPE was provided for free to all registered miners. The kit includes helmet, masks, uniforms, gloves, glasses and protective shoes.

At Mutoshi, using the PPE is obligatory and its use is controlled by the oversight bodies Pact and SAEMAPE. COMIAKOL helped to explain to all workers why wearing the PPE reduces risks, an effort that led to greater acceptance of its use in practice. However, the PPE at Mutoshi has worn out after more than a year of use. According to calculations by Chemaf, replacing the equipment for 5,000 workers would cost around \$120,000. However, the low cobalt price has also affected the finances of the cooperative and it currently does not have sufficient funds to replace the PPE.

At Kasulo, miners were not wearing PPE during the visit. This reluctance to use PPE reinforces the need for oversight by project partners to ensure artisanal miners are protected against health and safety risks. These facts demonstrate not only that PPE should be practical for the working context but also that individuals should consistently be encouraged to wear PPE and that PPE should be regularly renewed.

5.7 Monitoring of the standards

The implementation of the ASM standards requires ongoing on-site monitoring. At Mutoshi, Trafigura employed Pact as its implementation partner on the ground. Pact provides Trafigura with risk assessments, on-site technical support and help with organizing stakeholder engagement and specialized training. Currently, two Pact staff members are based on the Mutoshi site and the project lead is based in the DRC's capital, Kinshasa. Chemaf and COMIAKOL's health, safety and environment (HSE)

team also monitor the site daily. The large overhead that was necessary to start and run the Mutoshi project calls into question whether this model can be replicated outside of LSM sites. Also, the state monitoring organization, SAEMAPE, has offices at Mutoshi and inspects the sites, but SAEMAPE's monitoring efforts could not be assessed during the visit. Independent assessments that establish the level of compliance with the company expectations would further strengthen the credibility of this pilot project.

5.8 Grievance procedures

At Mutoshi, workers can file grievance complaints directly with COMIAKOL. It was not possible to make an assessment of the effectiveness of this process or conduct an inquiry into the existence of a log of grievances filed by miners during the research

trip. At each site, there should be a grievance mechanism that outlines a formal procedure for the resolution of a complaint. More research is required to better understand effective grievance procedures in the DRC's ASM context.

5.9 Community development to remedy child labour

The field assessment for this white paper was limited to the project sites and did not extend to the local communities. Yet interviews with representatives of an NGO, The Good Shepherd International Foundation (through local affiliate Bon Pasteur Kolwezi), made clear that poverty-stricken communities still need major support. For example, to ensure that children have access to free education, additional schools need to be built for a growing population of students. Teachers need to be trained, and book and school uniform donations are necessary because even minimal cost can prevent parents from sending their children to school. Consequently, many children start working or accompany their parents to mines.

While these are primarily government functions, given the DRC government's limited financial

resources, a range of outside actors including foreign governments, international financial institutions and major multinational companies that benefit from cobalt production also need to be involved.⁵⁹ A comprehensive impact will require the development of a shared responsibility model along the lines of that proposed by the Global Council on Human Rights of the World Economic Forum in 2015.⁶⁰

Such community development is also mandated by the DRC government under the 2018 mining code, which requires mining companies to pay 0.3% of their revenues to "community development projects".⁶¹ The projects funded by this provision and other non-mandatory, community-based activities will be vital to building a comprehensive strategy to address child labour in the long term.

5.10 Responsible exit plans

Trafigura is currently discussing the future of the Mutoshi project with Chemaf. Once cobalt resources are depleted at Mutoshi, Chemaf and its partners will seek to build a responsible exit strategy for the Mutoshi project and, depending on the findings of the drilling conducted by Chemaf geologists, they may choose to develop a new ASM site within the same concession. This is not an isolated situation.

All formalization projects will have a limited time horizon due to the finite nature of resources at any location. This planning for a responsible exit should be considered at the outset as part of the design phase. Assessing formalization projects that are more advanced in other supply chains, including gold and diamonds, may provide useful input for possible good practices.

Recommendations for the future

Based solely on the review of the mines noted in this evaluation, for formalization standards to be developed and implemented effectively four things need to happen.

6.1 Promote ASM formalization

The formalization of ASM sites should be endorsed across the battery value chain as an essential component of cobalt mining and as a complement to LSM concessions. This includes identifying appropriate mining sites for ASM and addressing the legalization question of ASM activity on LSM sites. Anchoring ASM formalization efforts in the rule of law is a necessary condition for advancing formalization.

With the new mining law, the DRC introduced a legal basis for the ASM–LSM relationship, but it lacks the legislative tools to enhance this cooperation. More concrete legal routes that build on national regulations, and multistakeholder initiatives and platforms that integrate local expertise are required to implement this recommendation.

6.2 Adopt common standards and metrics

The first stage of such a process should be the adoption of industry standards and metrics in a multistakeholder process that includes local stakeholders from the outset. These standards will help to clarify the expectations for ASM formalization and help to increase the acceptance of ASM products in the market. Second, the group should create a formalized system to oversee the implementation and assessment of these standards and metrics as part of cobalt production at all

formalized ASM sites in the DRC. ASM formalization is not a new topic. ASM formalization projects exist for gold mining in Columbia,⁶² Mongolia⁶³ and Rwanda.⁶⁴ The existing efforts to define and establish ASM standards in other mining industries (e.g. CRAFT, Fairmined and CTC) and in the cobalt context can provide the departure point for consultation and engagement with a broad set of stakeholders.

6.3 Establish a monitoring and assessment process

Once the standards and metrics are in place, the multistakeholder initiative needs to build an ongoing monitoring and oversight capacity to ensure compliance with these standards. While the structure and form will need to be determined by the group itself, it will need to have sufficient independence and transparency to give consumers confidence in the system. It will also require adequate resources to undertake this work effectively.

More than 20 years ago, the garment industry adopted metrics and monitoring tools, which independent auditors can apply to ensure that minimum standards are met in production sites. While the social auditing methodology is unable to shed light on the root causes of systemic issues, it has served as a tool to regularly engage with suppliers and establish baseline data against which compliance can be determined and progress can be measured.

6.4 | Share knowledge and responsibility

The challenges in the DRC are too great for any single actor to take on alone. Multistakeholder platforms can help to pool knowledge and resources among companies and other stakeholders to tackle long-term, systemic human rights challenges such as child labour. For example, a discussion with

governments (including the DRC government) and international financial institutions could be initiated to determine the best means to ensure access to education and other social benefits for children living in mining communities.



Appendix – Conversation and interview partners

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Group Purchasing and Supplier Network, Head of Sustainability, Innovation Management, Cooperations, BMW

Luc Lenge Asosa

Development Program Manager, Pact

Claudia Becker

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Simone Capolupo

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Me Schadrack Mukad Mway End Naw

President of the Lualaba Province, Cadre de Cencertation Provincial de la Société Civile Province Lualaba

Sylvestre Ngombe Kingudi (Petit-Petit)

Head of Miners' Cooperative at Mutoshi, COMIAKOL

James Nicholson

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The paper was researched and written by **Dorothee Baumann-Pauly**, Director of GCBHR and the Research Director at the NYU Center. All photographs shown in this paper were taken by the lead author. Her research assistant, **Serra Cremer Iyi**, contributed to the project during the desk research phase from July to September

2019 and during the revision of this white paper in the spring and summer of 2020. **Michael Posner** and **Paul Barrett** of the NYU Center supported this paper by sharing their expertise in the drafting and revision stages of this paper.

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NYU Stern Center for Business and Human Rights

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Endnotes

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