

# Enhancing Human Rights and Sustainable Practices in Cobalt Mining: The Role of Supply Chain Due Diligence

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## Abstract

Artisanal and small-scale cobalt miners in the Democratic Republic of Congo (DRC) face numerous human rights abuses, including poor working conditions and child labor exploitation. As the DRC remains a global leader in cobalt production, driven by the increasing demand for lithium-ion batteries, concerns over the health and well-being of these miners have escalated. While previous attempts to address the issue, such as Law No. 007/2002, fell short, this research paper proposed a solution centered around international legislative regulations requiring supply chain due diligence and responsible cobalt standards. This research paper examined the effectiveness of supply chain due diligence through a case study of two artisanal and small-scale mining sites in the DRC. Results revealed that implementing due diligence significantly curtails common human rights violations, such as child labor, by enforcing strict age control systems. Moreover, supply chain due diligence improves health and safety conditions in artisanal and small-scale mines, thus reducing occupational accidents and mitigating health risks associated with elevated cobalt exposure. Despite a counterargument questioning the efficacy of due diligence initiatives, the paper highlighted the adverse welfare impacts of eliminating artisanal mining, emphasizing the need for sustainable solutions. The proposed implementation involves an international cobalt supply chain management system, promoting ethical and safe standards for cobalt mining. While short-term challenges may arise during the certification process, strict enforcement of supply chain due diligence promises long-term benefits for artisanal and small-scale cobalt miners in the DRC. By safeguarding their human rights and improving working conditions, this solution aims to balance economic demands and social responsibility in the cobalt mining industry.

*Keywords: Cobalt Mining, Democratic Republic of Congo, Artisanal and Small-Scale Mining, Supply Chain*

## 1. Introduction

Artisanal and small-scale cobalt miners in the Democratic Republic of Congo (DRC) experience human rights abuses through poor working conditions and child labor exploitation. As defined by the National Minerals Information Center, cobalt is a metal mined as a byproduct of copper or nickel (National Minerals Information Center, 2023). Although many countries produce cobalt, the DRC is a global leader in cobalt production. According to the European Commission, a politically independent executive arm of the European Union, "The DRC produces about 60% of worldwide cobalt" (Figure 1) (European Commission, 2023). Cobalt is widely used in producing goods, including lithium-ion batteries for smartphones, computers, and electric vehicles, for which demand is growing (Figure 2). Specifically, the electric vehicle industry heavily relies on cobalt production. According to the Columbia Center on Sustainable Investment, a university-based applied research center and forum dedicated to studying, practicing, and discussing sustainable international investment, lithium-ion batteries are an "integral component to powering electric vehicles" (Ali, 2018). Furthermore, Raphael Deberdt and Philippe Le Billon, professors of anthropology and

geography, respectively, at the University of British Columbia, state that electric vehicle production is rising because of climate change initiatives (Deberdt and Le Billon, 2022). Therefore, cobalt production in the DRC is essential in

both global economies and climate change technologies. However, this recent evolution comes at the cost of the health of artisanal and small-scale cobalt miners in the DRC. The International Labor Organization defines artisanal and small-scale mining (ASM) as "mineral extraction undertaken by individuals, small groups of individuals, or cooperatives working with hand tools or elementary forms of mechanization" (Hentschel et al., 2003). As nations attempt to remain resilient in the fight against climate change, they also become tolerant of poor ASM conditions. Tomas Chamorro-Permuzic and Derek Lusk corroborate this idea in *The Dark Side of Resilience*. They claim that "when resilience is taken too far, it may put individuals on impossible goals and make them unnecessarily tolerant of unpleasant or counterproductive circumstances" (Chamorro-Permuzic and Lusk, 2017). Addressing climate is a necessary goal, but it must not infringe upon the human rights of ASM cobalt miners to achieve this goal. Célestin Banza Lubaba Nkulu, a professor of public health at the University of Lubumbashi, claims, "A substantial proportion (estimated at 15-20%) of cobalt in the DRC is being extracted by artisanal miners" (Nkulu et al., 2018). Also, due to the increasing demand for cobalt to make electric vehicles, children have been

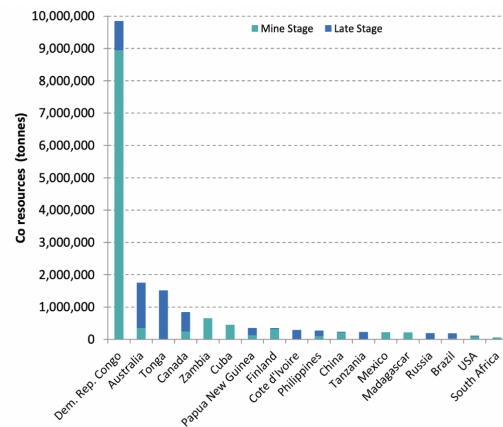


Figure 1. Illustrates 2023 cobalt deposits (in tonnes) by country, including mine stage and late stage. Note. European Commission. (2023). *Critical raw materials*. Single-Market-Economy.ec.europa.eu. [https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials\\_enfocus](https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials_enfocus)

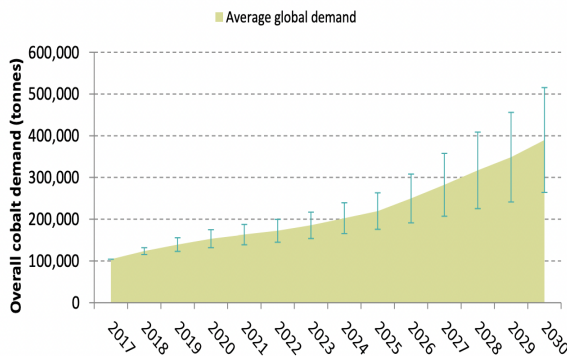


Figure 2. Displays global cobalt demand (in tonnes) from 2017 to 2030.

Note. European Commission. (2023). *Critical raw materials*. Single-Market-Economy.ec.europa.eu. [https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials\\_en](https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials_en)

employed to extract cobalt. Currently, "12.65% of the mining workforce living in mining communities is below the age of 18" (Faber et al., 2017). Ultimately, ASM cobalt miners in the DRC are vulnerable to severe health conditions because of the hazardous ASM conditions. International legislative regulations requiring supply chain due diligence and responsible cobalt standards should be implemented to solve this issue of human rights abuses, poor working conditions, and child labor exploitation among ASM cobalt miners in the DRC.

## 2. Method

This research employed a mixed-methods approach, integrating both qualitative and quantitative analyses to examine the conditions of ASM cobalt miners in the DRC. The qualitative aspect involved a

combination of qualitative and quantitative data provided a comprehensive perspective, enabling a well-rounded analysis of the situation. This methodological approach ensured a balanced examination, capturing both the human element and the empirical aspects of ASM cobalt mining, thus laying a solid foundation for the findings and recommendations presented in this research.

### 3. Previously Attempted Solution

The primary solution to improve the disadvantageous conditions for ASM cobalt miners was Law No. 007/2002, implemented by President Joseph Kabila. Filipe Calvão, an anthropology and sociology associate professor at the Geneva Graduate Institute, describes, "This 2002 law aimed to formalize ASM and fuel growth of DRC's mining industry through the creation of artisanal mining zones" (Calvão et al., 2021). To operate legally under this new law, ASM miners were required to obtain a mining permit to mine in designated areas. However, the law also included some harsh restrictions. Calvão notes, "Should the permit be lost, destroyed, or stolen, authorization for artisanal mining would not be reissued, adding to the vulnerability of miners." Additionally, the 2002 mining code stated that ASM zones should be developed where the "technological and economic factors are not suited for the site to be industrially exploited." Thus, ASM zones would be limited to the least profitable areas with poorer cobalt deposits. Despite the passage of Law No. 007/2002, ASM cobalt miners also lacked the financial security guaranteed by most formalized occupations. The price volatility of international cobalt markets took a heavy toll on the livelihoods of ASM cobalt miners. According to Calvão et al., "93% reported mining as their main source of income with no other personal or household source to supplement their livelihoods" (Calvão et al., 2021). Cobalt's recent two-year low of \$32,000 per tonne, compared to prices near \$100,000 per tonne in the first half of 2018, has led many miners to turn to less profitable alternatives that are less prone to price fluctuations. Ultimately, the passage of Law No. 007/2002 failed to formalize ASM because it increased the financial burden on ASM cobalt miners and reduced their mining security.

### 4. Solution Claim One

To formalize ASM and help address human rights abuses, countries should come together to implement international legislative regulations requiring supply chain due diligence based on responsible cobalt standards and mineral traceability systems. Supply chain due diligence occurs at ASM mines to ensure the safety and ethics of ASM. Lucia Mancini, a professional research councilor at the Slovenian National Building and Civil Engineering Institute, assesses the impacts of supply chain due diligence in ASM for cobalt through a case study of two ASM sites in the DRC. The first case of supply chain due diligence is *Better Mining*, an ASM site that regularly monitors working conditions and incident reports (Mancini et al., 2021). Access to this site is only possible through dedicated doors, which are constantly supervised. To enter, miners must provide a document certifying they are over 18 years old. The second case of ASM supply chain due diligence is the *Mutoshi Cobalt Pilot Project*, which also aims to improve safe working conditions by site monitoring and reporting information on incidents. Similarly, miners must enter through designated gates by showing their membership cards. Miners must wear personal protective equipment and closed shoes to enter the site. Overalls and hard hats are offered free of charge to the miners, ultimately ensuring the safety of ASM cobalt miners. Mancini et al. find that "in contrast to the baseline, where child labor is a serious risk, no cases of child labor or young adolescents working on sites have been either directly observed or reported by the Chief Security officers or miners consulted." Both pilot sites rigorously enforce age control systems to avoid the presence of minors on site. Mancini et al. conclude that the use of ASM due diligence in the *Better Mining* and the *Cobalt Pilot Project* resulted in "major improvement" for the "worst forms of child labor" and "improvement" for the "serious human rights violations." Although human rights violations are a severe risk in the ASM sector, this case study demonstrates that ASM due diligence entirely suppresses these common human rights violations.

### 5. Solution Claim Two

Mandatory supply chain due diligence also improves egregious health and safety conditions in ASM mines in the DRC. Elevated cobalt exposure (especially in children) increases the rate of birth defects and erectile dysfunction among ASM miners in the DRC (Mancini et al., 2021). Additionally, ASM sites in the DRC exhibit hazards and report a high frequency of occupational accidents. These poor working conditions cause both mental and physical suffering among artisanal and small-scale miners. However, the case study presented by Lucia Mancini et al. reveals success in combating these mines' egregious health and safety conditions. *Better Mining* and the *Mutoshi Cobalt Pilot Project* both demonstrated that supply chain due diligence improved the health and safety conditions for ASM cobalt miners. Mancini concludes, "Compared to the baseline, the occupational health and safety conditions on both sites are significantly better as neither has recorded any fatalities during the last year and the level of risk has decreased markedly according to both miners and consulted Chief Security Officers" (Mancini et al., 2021). Thus, regulations requiring supply chain due diligence would improve the human rights of ASM cobalt miners by eliminating the exploitation of child laborers and improving the working conditions for all ASM cobalt miners.

## **6. Counterargument**

However, Christoph Vogel, a former UN Security Council expert on the DRC, suggests that supply chain due diligence may be ineffective. Vogel points out that "supply chain due diligence initiatives have ambivalent effects on the livelihoods of local communities and that the income of artisanal miners has decreased in some areas" (Vogel et al., 2018). There were numerous reasons for these effects. For instance, ASM mines had to shut down for long periods until certification processes were completed, authorities rarely issued clear titles for land and mining, and there was a general lack of technical and financial support for artisanal miners. Furthermore, the supply chain due diligence and traceability reforms destroyed many of the existing local regulations for ASM mining sites and frequently created tensions among different newly established mining cooperatives (Vogel et al., 2018). One alternative solution to the ongoing human rights abuses of ASM cobalt miners in the DRC is to reduce or even eliminate ASM cobalt miners in favor of industrially mined cobalt by large-scale companies. This solution would eliminate the need for new regulations requiring supply chain due diligence.

## **7. Rebuttal**

Removing ASM mining can have detrimental welfare impacts. Benjamin Faber, an associate professor at the Department of Economics at the University of California Berkeley, points out that since a significant number of households and children depend on artisanal mining for their income, interventions that reduce demand for artisanal mining output are likely to harm the livelihoods of children and families living in the DRC (Faber et al., 2017). The risks are especially high because, on average, households in the DRC are poor, have limited ability to save, and are particularly vulnerable to regional demand shocks. Furthermore, since the search for additional household income is the primary reported cause of child labor, adverse shocks to ASM miners' income by forcing households to search for alternative, often less profitable activities could increase child labor in the region. Efforts to reduce or eliminate the sourcing of ASM of cobalt risk harming many households in the DRC. However, although the income of artisanal miners may slightly decrease, it would only be temporary. Once artisanal mines are certified, they need not be shut down again for certification. Additionally, destroying many of the existing informal local regulations for ASM mining sites creates safety standards and regulations to ensure that all ASM mines have safe working conditions.

## **8. Conclusion**

In concluding this research on the conditions of ASM cobalt miners in the DRC, it is crucial to acknowledge the challenges and limitations encountered during the study. One significant challenge was the reliance on secondary data sources, including academic papers and reports. While these sources provided valuable insights, there is a potential for bias or outdated information, which could affect the comprehensiveness and accuracy of our findings. Furthermore, the complexity of tracking and verifying data within the cobalt supply chain posed difficulties in obtaining real-time, on-ground information. Additionally, the nature of this research, primarily based on qualitative accounts and

quantitative data from 12 sources, means that the conclusions drawn may not encompass all perspectives or the full scope of the situation in the DRC. The limited number of sources, while carefully selected, may not fully represent the diverse experiences of all ASM cobalt miners. Future research should aim to incorporate primary data sources, such as first-hand interviews with miners, local community leaders, and government officials in the DRC. This approach could provide a more direct and nuanced understanding of the ASM cobalt mining conditions. Moreover, exploring technological advancements in traceability and supply chain transparency could offer more accurate data for analysis. Further exploration is also needed on the socio-economic impacts of cobalt mining on the local communities. This includes examining the long-term effects of mining activities on public health, environment, and social structures. Collaborative research involving local stakeholders, international organizations, and the mining industry could lead to more holistic and effective solutions. Lastly, ongoing actions should focus on developing and enforcing international standards for responsible mining practices. These standards must be backed by robust monitoring and evaluation mechanisms to ensure compliance and effectiveness. Involvement and support from global entities, including the United Nations and World Health Organization, could play a pivotal role in enhancing the welfare of ASM cobalt miners and their communities. In summary, while this research provides important insights into the ASM cobalt mining sector in the DRC, acknowledging its limitations and the need for continued, more diversified research is essential for a deeper and more accurate understanding of the situation. It is hoped that the findings and recommendations of this study will contribute to the ongoing efforts to improve the lives of ASM miners and their communities in the DRC.

## References

- Ali, S., et al. (2018). Resourcing green technologies through smart mineral enterprise development: A case analysis of cobalt. *SSRN Electronic Journal*. doi:10.2139/ssrn.3669838
- Banza Lubaba Nkulu, C., et al. (2018). Sustainability of artisanal mining of cobalt in DR Congo. *Nature Sustainability*, 1(9), 495–504. doi:10.1038/s41893-018-0139-4
- Calvão, F., Mcdonald, C. E. A., & Bolay, M. (2021). Cobalt mining and the corporate outsourcing of responsibility in the Democratic Republic of Congo. *The Extractive Industries and Society*, 8(4), 100884. doi:10.1016/j.exis.2021.02.004
- Cobalt statistics and information. (2023). Retrieved 24 July 2023, from <https://www.usgs.gov/centers/national-minerals-information-center/cobalt-statistics-and-information>
- Chamorro-Premuzic, T., & Lusk, D. (2017, August 16). The dark side of resilience. *Harvard Business Review*. Retrieved from <https://hbr.org/2017/08/the-dark-side-of-resilience>
- Deberdt, R., & Le Billon, P. (2022). The Green transition in context—cobalt responsible sourcing for battery manufacturing. *Society & Natural Resources*, 35(7), 784–803. doi:10.1080/08941920.2022.2049410
- European Commission. (2023). *Critical raw materials*. Single-Market-Economy.ec.europa.eu. [https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials\\_en](https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials_en)
- Faber, B., et al. (2017). Artisanal mining, livelihoods, and child labor in the cobalt supply chain of the Democratic Republic of Congo. Retrieved 24 July 2023, from [https://cega.berkeley.edu/assets/cega\\_research\\_projects/179/CEGA\\_Report\\_v2.pdf](https://cega.berkeley.edu/assets/cega_research_projects/179/CEGA_Report_v2.pdf).
- Hentschel, T., Hruschka, F., & Priester, M. (2003). *Challenges and Opportunities Artisanal and Small-Scale Mining*. <https://www.iied.org/sites/default/files/pdfs/migrate/9268IIED.pdf>
- ILO. (1999). *Social and labour issues in small-scale mines. Report TMSSM/1999*. Retrieved from [https://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS\\_PUBL\\_9221114805\\_EN/lang-en/index.htm](https://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_PUBL_9221114805_EN/lang-en/index.htm).

Mancini, L., et al. (2021). Assessing impacts of responsible sourcing initiatives for cobalt: Insights from a case study. *Resources Policy*, 71(102015), 102015. doi:10.1016/j.resourpol.2021.102015

Vogel, C., Musamba, J., & Radley, B. (2018). A miner's canary in eastern Congo: Formalisation of artisanal 3T mining and precarious livelihoods in South Kivu. *The Extractive Industries and Society*, 5(1), 73–80. doi:10.1016/j.exis.2017.09.003