

# Forced Labor in Cobalt Mining in the Democratic Republic of the Congo

## Final Report

United States Department of Labor

Bureau of International Labor Affairs

Office of Child Labor, Forced Labor, and Human Trafficking

**May 30, 2023**

This publication was produced for review by the United States Department of Labor. It was prepared by ICF Macro, Inc.



## ACKNOWLEDGMENTS

This report presents research on the prevalence of forced labor in cobalt mining in the Democratic Republic of the Congo. ICF Macro, Inc. prepared this report according to the terms specified in its contract with the United States Department of Labor. The research team would like to express sincere thanks to all the parties involved for their support and valuable contributions.

Funding for this research was provided by the United States Department of Labor under contract number I605DC-I8-A-0016 and task order I605C2-20-F-0046. This material does not necessarily reflect the views or policies of the United States Department of Labor, nor does the mention of trade names, commercial products, or organizations imply endorsement by the United States Government.

This study was conducted by ICF and Marakuja Kivu Research.

### ICF

Suteera Nagavajara, Project Manager

Holly Koogler, Technical Lead

Ronaldo Iachan, Senior Statistician

Melody Kimani, Field Manager

Sindhura Geda, Data Analyst

Lily D'olce, Data Analyst

Melissa Romero, CAPI Programmer

### Marakuja Kivu Research

Issa Kiemtoré, Research Manager

Aimable Amani Lameke, Director of Operations

Paulin Bazuzi Christian, Senior Field Manager

Edmond Mutombo Musangachi, Field Manager

Limbisa Nakitumba Sylvain, Field Manager

Junior Matekete Mali Bulaya, Field Team Leader

Richard Tshilombo Mwin Kavul, Field Team Leader

Freddy Koleramungu, Field Team Leader

Mirah Mashant Kathund, Field Team Leader

Matthieu Mashindola, Field Team Leader

Olivier Mamba Kalimba, Field Team Leader

# CONTENTS

- ACKNOWLEDGMENTS.....ii**
- ACRONYMS AND KEY TERMS.....v**
- EXECUTIVE SUMMARY.....vi**
- I. STUDY OBJECTIVES AND BACKGROUND ..... I**
  - 1.1. Objective of the study..... I
  - 1.2. Background ..... I
    - 1.2.1. Definitions..... I
    - 1.2.2. Cobalt sector ..... 2
    - 1.2.3. Forced labor in cobalt mining in the DRC..... 4
- 2. STUDY DESIGN..... 6**
  - 2.1. Sampling methodology..... 6
    - 2.1.1. Selection of sampling units..... 6
    - 2.1.2. Household selection..... 6
    - 2.1.3. Selection of respondents within households..... 7
    - 2.1.4. Response rate and final sample..... 7
    - 2.1.5. Weighting and estimation..... 7
  - 2.2. Development of key measures and questionnaire..... 8
    - 2.2.1. Operationalizing the definition of forced labor..... 8
    - 2.2.2. CAPI program..... 9
- 3. STUDY IMPLEMENTATION..... 10**
  - 3.1. Ethical considerations..... 10
    - 3.1.1. Informed consent..... 10
  - 3.2. Training and preparation activities ..... 10
  - 3.3. Data collection ..... 11
    - 3.3.1. Data quality control..... 11
- 4. STUDY LIMITATIONS..... 12**
- 5. FINDINGS ..... 14**
  - 5.1. Sample characteristics ..... 14
  - 5.2. Forced labor indicators and prevalence..... 18
    - 5.2.1. Prevalence of forced labor..... 18
    - 5.2.2. Indicators of involuntariness and coercion ..... 22
    - 5.2.3. Number of workers in forced labor..... 25
    - 5.2.4. Roles in cobalt mining associated with increased vulnerability to forced labor..... 26
  - 5.3. Working conditions and hazards ..... 27
    - 5.3.1. Recruitment and contracts ..... 27
    - 5.3.2. Worker safety and health ..... 29
    - 5.3.3. Working hours and days ..... 32
    - 5.3.4. Earnings and mineral sales..... 32
    - 5.3.5. Child labor ..... 35

**6. CONCLUSION ..... 36**  
**APPENDIX A: FORCED LABOR STATISTICAL DEFINITION ..... 39**  
**APPENDIX B: QUESTIONNAIRE..... 40**  
**APPENDIX C: MAPS..... 102**  
**APPENDIX D: ADDITIONAL TABLES ..... 104**  
**APPENDIX E: COMPARISON OF COBALT AND NON-COBALT MINE WORKERS... 108**

## ACRONYMS AND KEY TERMS

ASM	artisanal and small-scale mining
CAPI	computer-assisted personal interviewing
CI	confidence interval
<i>dépôts</i>	buying houses
DRC	Democratic Republic of the Congo
<i>fondeurs</i>	smelters
ICLS	International Conference of Labour Statisticians
ILO	International Labour Organization
LSM	large-scale mining
<i>negociants</i>	traders
OR	odds ratio
SE	standard error
ZEA	<i>zones d'exploitation artisanale</i> (artisanal mining zones)

## EXECUTIVE SUMMARY

The mining of cobalt in the Democratic Republic of the Congo (DRC) is linked to major human rights risks, including forced labor and child labor. Although the working conditions of those in the cobalt sector are widely acknowledged to be problematic, little was previously known about the scale or specifics of these issues. This study helps fill this gap. The objective of this study was to gather quantitative data on the prevalence and nature of forced labor in the mining of cobalt in the DRC. The study aims to estimate the prevalence of forced labor in cobalt mining in the DRC; understand the demographic characteristics of workers experiencing forced labor; explore the various roles within the context of the cobalt supply chain, particularly at the mining level, and which roles maybe involve increased vulnerability to forced labor; and understand the working conditions in the cobalt mining industry, particularly the hazards involved in the work.

### Background

Cobalt is essential for a wide array of modern products, including lithium-ion batteries, wind turbines, electric vehicles, computers, cell phones, vacuum cleaners, and hearing aids. Global production of cobalt rose from an average global production of 38,000 tonnes per annum over the 1970 to 2009 period to around 145,000 tonnes per annum over the recent 2010 to 2019 period,<sup>1</sup> and demand is likely to double again by 2030.<sup>2</sup> The DRC accounts for about 70 percent of the world's cobalt supply,<sup>3</sup> and most cobalt mined in the DRC comes from two provinces in the south: Haut-Katanga and Lualaba. Cobalt is mined through artisanal mining, which uses “a largely manual mode of extraction,”<sup>4</sup> through small-scale mining, which is similar to artisanal mining except that the first stage is mechanized, and through large-scale mining (LSM), which typically uses “a mechanized mode of production.”<sup>5</sup>

### Methods

Data collection took place from August 6 to August 22, 2022.

**Questionnaire:** This study uses the definition of forced labor contained in International Labor Organization (ILO) Convention 29 as the DRC has ratified this fundamental convention.<sup>6</sup> The questionnaire included questions matched to the indicators of forced labor laid out in the 20th International Conference of Labour Statisticians (ICLS) *Guidelines Concerning the Measurement of Forced Labour* (2018).<sup>7</sup> The questionnaire was administered by trained interviewers using tablets.

**Sampling:** The study used probability methods to select a sample of adult cobalt mine workers representative of all cobalt mine workers in Lualaba and Haut-Katanga. Sample frame development involved primary research to identify communes and villages with cobalt mining activity (defined as within five kilometers of a mine). Our sample included 64 villages in 16 communes, and interviewers attempted interviews at an average of 16 households per village. The final sample size was 946 eligible

---

<sup>1</sup> OECD. Interconnected supply chains: a comprehensive look at due diligence challenges and opportunities sourcing cobalt and copper from the Democratic Republic of the Congo. (2019). <https://mneguidelines.oecd.org/Interconnected-supply-chains-a-comprehensive-look-at-due-diligence-challenges-and-opportunities-sourcing-cobalt-and-copper-from-the-DRC.pdf>; USGS. Cobalt Statistics and Information. Accessed October 2022. <https://www.usgs.gov/centers/national-minerals-information-center/cobalt-statistics-and-information>.

<sup>2</sup> Holman, J. (2020). “Cobalt demand set to roughly double by 2030: Roskill.” S&P Global. <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/metals/120120-cobalt-demand-set-to-roughly-double-by-2030-roskill>

<sup>3</sup> USGS. Mineral Commodity Summaries 2022 – Cobalt. <https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-cobalt.pdf>.

<sup>4</sup> Stoop, N., Verpoorten, M., & Van Der Windt, P. (2019). Artisanal or industrial conflict minerals? Evidence from Eastern Congo. *World Development*, 122, 660-674.

<sup>5</sup> Ibid.

<sup>6</sup> C029 (Forced Labour Convention, 1930): “For the purposes of this Convention the term **forced or compulsory labour** shall mean all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily.”

<sup>7</sup> ILO. (2018). Guidelines concerning the measurement of forced labour . ICLS/20/2018/Guidelines. Geneva: ILO. [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/meetingdocument/wcms\\_648619.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/meetingdocument/wcms_648619.pdf).

adult (at least 18 years old) cobalt worker respondents. A majority of eligible cobalt worker respondents lived in close proximity of a Chinese-associated cobalt mine or facility—within 5km and one hour walking—as measured by publicly-available data.

## Limitations

The lack of recent population data and the absence of a full list of cobalt mine sites may reduce the accuracy of the weights used, and relatedly, the resulting weighted estimates. The study likely failed to capture a significant proportion of workers in auxiliary roles related to cobalt mining, and as a result, it likely underestimates the proportion of women involved in cobalt production. The study did not collect forced labor data on workers who identified as self-employed, and therefore the estimate of the prevalence forced labor in the cobalt mining sector should be considered highly conservative because it does not account for forced labor in this sub-population. The study did not assess whether respondents worked in the LSM or artisanal and small-scale mining (ASM) sector, but rather asked respondents to self-report the type of mine site at which they worked.<sup>8</sup> The data should not be interpreted as estimates of the distribution of forced labor across the ASM or LSM sectors.

## Findings

**Background and job characteristics:** Nearly half of workers (45 percent) were born outside of their province of work. Almost twice as many of those working in Lualaba (64 percent) were born outside their province of work, compared to those working in Haut-Katanga (36 percent). Almost all workers (97 percent) in the population represented by this sample are male. Nearly three-fourths (72 percent) of workers work at ASM sites, and 28 percent work at LSM sites. Almost all workers at ASM sites are self-employed (95 percent), and almost all workers who work at LSM sites are employed by employers (85 percent). On average, workers at ASM sites are slightly younger than those at LSM sites (31.6 years for ASM and 33.9 years for LSM). The majority of workers (98 percent) have at least some formal education, and 87 percent of workers completed primary school. A much higher proportion of workers at LSM sites (49 percent) completed a secondary or higher education, compared to those at ASM sites (26 percent). The primary mining activities for workers at ASM sites compared to workers at LSM sites are notably different. Digging ore without machines is by far the most common primary mining activity for workers at ASM sites (70 percent). Workers at LSM sites do a wider variety of primary tasks, and the most common are cleaning or preparing tools or workspaces (24 percent) and digging for ore using machines (15 percent). Workers engage in an average of 2 mining activities, with workers at ASM sites engaging in slightly more activities (2.2) on average, compared to those at LSM sites (1.6).

**Forced labor:** The study identified 251 cases of forced labor among employed cobalt workers in the sample and extrapolated a weighted estimate that 78 percent of *employed cobalt workers* experience forced labor.<sup>9</sup> Bearing in mind research limitations, the study offers an estimate of forced labor among *employed adult workers in cobalt mining*: between 67,000 and 80,000 workers experience forced labor.<sup>10</sup> The main indicators of involuntariness are being unable to refuse to do hazardous work, being subjected to abusive overtime requirements to which they have not agreed, and deceptive recruitment. The main indicators of coercion are restrictions on workers' movements, abuse of worker vulnerability, and withholding of wages or other promised benefits. Nearly half of employed workers (47 percent) experience coercion related to overtime, and 40 percent experience coercion related to the requirement to do hazardous work. On average, employed workers experience 1.7 indicators of involuntariness, 1.6 indicators of coercion, and 3.3 total indicators of either involuntariness or coercion. Twenty-three percent of employed workers experience 5 or more indicators of either involuntariness or coercion. The study found that being paid below minimum wage, having a production quota, and

<sup>8</sup> Consequently, the study reports data as “workers at LSM sites” for workers who reported that their work site was a large-scale or industrial mine site, and “workers at ASM sites” for workers who reported that their work site was an artisanal or small-scale/semi-industrial site.

<sup>9</sup> The unweighted percentage of employed cobalt workers in the sample who experienced forced labor is 251 out of 340 (73.8%).

<sup>10</sup> The estimated total number of cobalt mine workers, include both employed and self-employed workers, is 305,255 to 350,000.

working in Haut-Katanga (versus Lualaba) were significant predictors of forced labor. The study further identified the presence of forced labor in villages close to certain Chinese-associated cobalt mines and facilities, consistent with the widespread nature of Chinese mining interests in the DRC. A majority of employed cobalt miners who live in close proximity (within 5km and 1 hour walking) to Chinese-associated cobalt mining sites and facilities, notably including the Kasulo and Ruashi mines, experienced forced labor (62 percent, 65 out of 105 respondents).<sup>11</sup>

**Exposure to hazards:** Most workers reported exposure to multiple hazards. On average, employed workers who experience forced labor are exposed to more hazards (5.0), compared to employed workers who do not experience forced labor (4.0). Among all workers, the most common hazards are dust or strong fumes without appropriate protective equipment (84 percent), using dangerous or sharp tools or heavy machinery without appropriate protective equipment (77 percent), and carrying unreasonably heavy loads (77 percent). Less than half of workers (43 percent) report usually wearing protective gear. The proportion who report wearing protective gear is much lower for workers at ASM sites (29 percent) compared to those at LSM sites (79 percent). The proportion who report wearing protective gear is similar for employed workers who experience forced labor (79 percent) and for those who do not experience forced labor (86 percent). Workers were asked whether there is protective equipment they do not have that would make them feel safer, and two-thirds of all workers (66 percent) answered in the affirmative.

**Illness and injury:** Nearly two-thirds of all workers (63 percent) have gotten hurt or sick because of their work in their most recent job in cobalt mining. The rate of injury or illness is nearly twice as high for workers at ASM sites (72 percent) as it is for workers at LSM sites (39 percent). Moreover, workers who experience forced labor have more than twice the rate of injury or illness (45 percent), compared to workers who do not experience forced labor (21 percent). Among those who have been hurt or injured, the most common type of ailments are injuries to feet (43 percent), injuries to knees or legs (42 percent), and injuries to or swelling in hands (41 percent). The most common ways the injuries or illnesses occur are falling rocks (57 percent) and tool accidents (57 percent).

**Earnings and hours worked:** In general, cobalt mining pays relatively well by DRC standards, but a small proportion of workers earn less. On average, mine workers earn about \$8 per day, and workers at ASM sites tend to earn more (\$9 per day) than those at LSM sites (\$6 per day). The median daily earnings of those experiencing forced labor are an estimated 41 percent lower than the earnings of those not experiencing forced labor. Ten percent of those experiencing forced labor earn less than minimum wage in DRC (\$3.50 per day). On average, cobalt workers work 9.5 hours per day, 5 days per week, and they average 51 hours per week. Workers at LSM sites average more hours per week (59 hours per week) than workers at ASM sites (49 hours per week), and the number of hours is similar for employed workers who do and do not experience forced labor.

**Sale of minerals:**<sup>12</sup> Workers at ASM sites report that the minerals are sold to traders (*negociants*; 53 percent) or buying houses (*dépôts*; 57 percent). Most workers at LSM sites (56 percent) reported not knowing where the minerals are sold, but 16 percent reported sales to buying houses (*dépôts*), 11 percent reported sales to smelters (*fondeurs*), 6 percent reported sales to traders (*negociants*), and 9 percent reported sales to other places including international markets. Among those who know where the minerals are sold, 62 percent report that the place where the minerals are sold is owned by a Congolese person, and 46 percent report that the place where the minerals are sold is foreign owned. Sampled cobalt workers reported that among foreign-owned trading places, 91 percent of owners were Chinese, and 14 percent were Indian. Nearly all (92 percent) workers experiencing forced labor

---

<sup>11</sup> The study analyzed the proximity of worker villages to certain Chinese-associated mines and facilities; the research did not gather information about these workers' specific employers.

<sup>12</sup> Percentages do not sum to 100 percent because multiple responses were allowed.



reported that the minerals they produced are sold to foreign-owned entities (52 percent to Chinese-owned entities, 31 percent to Indian-owned entities).

**Child labor:** About two-thirds of workers at ASM sites and a quarter of workers at LSM sites report that children work at their worksite.<sup>13</sup>

## **Conclusion**

In aggregate, these findings indicate that labor conditions for cobalt mine workers are abominable. Workers are routinely exposed to a panoply of work-related hazards, most suffer illness or injury related to their work, and many experience forced labor. Policies and interventions seeking to improve working conditions in cobalt should target workers at both ASM and LSM sites. Given the widespread presence of Chinese-associated cobalt mines and facilities in the DRC, and the proximity of some of these sites to villages with high incidence of forced labor, these findings suggest that Chinese cobalt interests, such as ownership of mine sites and trading places, may be associated with the forced labor landscape in the DRC. Further research should be conducted to understand how Chinese-associated businesses may be influencing the labor environment for Congolese workers. Additional research is also needed on all fundamental labor rights in cobalt mining beyond forced labor; gender discrimination; freedom of association and collective bargaining; and the intersection between cobalt mining and other economic activities, such as agriculture, in cobalt mining areas. There is a monumental need to address labor conditions among nearly all cobalt mine workers in the DRC.

---

<sup>13</sup> These respondent reports are not estimates of child labor prevalence in the sector, but rather should be taken as indications that child labor is an issue in the DRC's cobalt mining sector.

# I. STUDY OBJECTIVES AND BACKGROUND

The Copperbelt of the Katanga region (modern-day Haut-Katanga, Lualaba, Tanganyika, and Haut-Lomami), an area of the wider Central African Copperbelt, was the industrial flagship of Congo-Zaire, organized around the mining city of Lubumbashi during the colonial period but also after independence. When the Democratic Republic of the Congo (DRC) entered a period of unprecedented economic, political, and social crises in the 1990s, the mining sector in the Copperbelt of the Katanga region was changed dramatically by the collapse of Gécamines (*Société Générale d'Etat des Carrières et des Mines*) and experienced a large drop in production.<sup>14</sup> With the end of the war in 2003 and the increase in political stability, the mining sector in the Copperbelt of the Katanga region greatly increased production to meet the strong demand for raw materials, essentially from China and India. Although some “western” companies slowly exited the Copperbelt space as Chinese companies entered, there are notable European, Australian, and Canadian companies who have endured, such as Glencore-Swiss and various Belgian-affiliated industrial companies. Mining now accounts for 90 percent of the country's exports and is a central component of the Congolese economy. However, the mining of cobalt in the DRC is linked to major human rights risks, including forced labor and child labor. Cobalt ore from the DRC has been on the United States Department of Labor's *List of Goods Produced by Child Labor or Forced Labor* since 2009 for child labor.

## I.1. Objective of the study

The objective of this study was to gather quantitative data on the prevalence and nature of forced labor in the mining of cobalt in the DRC. The study aims to:

1. Estimate the prevalence of forced labor among adult miners in cobalt mining in the DRC
2. Understand the demographic characteristics of adult workers experiencing forced labor
3. Explore the various roles within the context of the cobalt supply chain, particularly at the mining level, and which roles maybe involve increased vulnerability to forced labor
4. Understand the working conditions in the cobalt mining industry, particularly the hazards involved in the work

This report first presents background information, followed by a discussion of the study design, implementation, and limitations. *Section 5. Findings* explores both the characteristics of forced labor and the prevalence of forced labor among miners. Finally, the report provides a conclusion.

## I.2. Background

### I.2.1. Definitions

#### *Forced labor*

This study uses the definition of forced labor contained in International Labor Organization (ILO) Convention 29 as the DRC has ratified this fundamental convention.<sup>15</sup> The questionnaire included questions matched to the indicators of forced labor laid out in the 20th International Conference of Labour Statisticians (ICLS) *Guidelines Concerning the Measurement of Forced Labour* (2018).<sup>16</sup> According to the ICLS guidelines, “a person is classified as being in forced labour if engaged during a specified

---

<sup>14</sup> Gécamines is the state-controlled commodity trading and mining corporation founded in 1966 and headquartered in Lubumbashi, Haut-Katanga.

<sup>15</sup> C029 (Forced Labour Convention, 1930): “For the purposes of this Convention the term **forced or compulsory labour** shall mean all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily.” The DRC has also ratified ILO Convention 105: C105 (Abolition of Forced Labour Convention, 1957).

<sup>16</sup> ILO. (2018). Guidelines concerning the measurement of forced labour . ICLS/20/2018/Guidelines. Geneva: ILO. [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/meetingdocument/wcms\\_648619.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/meetingdocument/wcms_648619.pdf).

reference period in any work that is both under the threat of menace of a penalty and involuntary” (p. 2). The ICLS guidelines include definitions of both menace of penalty and involuntary work.

Consistent with this definition, the study includes quantitative estimates of forced labor as well as separate estimates of indicators of involuntariness and menace of penalty, which individually do not constitute forced labor but can be seen as risk factors as forced labor is the combination of involuntariness and menace of penalty. The study notes where these estimates constitute forced labor.<sup>17</sup>

#### *Cobalt miner*

For the purpose of this study, a cobalt miner is an individual who performed an activity related to the extraction of cobalt in the past year. This includes workers who personally dig into the earth (known as *creuseurs*, meaning diggers) and any other person who works manually within a mine site or in the processing of minerals, as well as other workers at mine sites, such as drivers, mechanics, and lab technicians. It also includes those who are involved peripherally with the mine in activities such as selling food, goods, or services to mine workers. See 4. *Study Limitations* for more details on the challenges of applying this definition in practice.

#### *Artisanal and small-scale mining (ASM)*

Artisanal mining “refers to a largely manual mode of extraction, practiced by individuals, groups or communities.”<sup>18</sup> Small-scale mining is similar to artisanal mining except that the first stage, stripping of the first layers of earth, is mechanized. According to law, small-scale mining requires “a minimum of fixed installations, using semi-industrial or industrial processes, after the discovery of a deposit”<sup>19</sup> For the purposes of this study, artisanal and small-scale mining are explored jointly and are referred to as ASM.

#### *Large-scale mining (LSM)*

LSM, also called industrial mining, “refers to a mechanized mode of production, practiced by large, often international, companies.”<sup>20</sup> While the LSM sector is characterized by capital intensive, mechanized and industrial-scale mining, artisanal mining activities may occur on LSM sites, either informally or on legally designated artisanal mining zones (*zones d'exploitation artisanale*, or ZEAs).

#### *Adult*

In contrast to a child, defined in International Labour Organization (ILO) Convention No. 182 on the Worst Forms of Child Labor (ILO C. 182) as a person under age 18, an adult is a person age 18 or older.

### **1.2.2. Cobalt sector**

Cobalt is essential for a wide array of modern products, including lithium-ion batteries, wind turbines, electric vehicles, computers, cell phones, vacuum cleaners, and hearing aids. Global production of cobalt rose from an average global production of 38,000 tonnes per annum over the 1970 to 2009 period to around 145,000 tonnes per annum over the recent 2010 to 2019 period due the increased

---

<sup>17</sup> When analyzed separately, indicators of involuntariness and indicators of menace of penalty do not necessarily constitute forced labor, as forced labor requires both the presence of involuntariness and menace of penalty.

<sup>18</sup> Stoop, N., Verpoorten, M., & Van Der Windt, P. (2019). Artisanal or industrial conflict minerals? Evidence from Eastern Congo. *World Development*, 122, 660-674.

<sup>19</sup> Loi n° 18/001 du 09 mars 2018 modifiant et complétant la Loi n° 007/2002 du 11 juillet 2002 portant Code minier.

<https://www.leganet.cd/Legislation/Droit%20economique/Code%20Minier/Loi.18.001.09.03.2018.html#:~:text=exploitation%20artisanale%20%3A%20toute%20activit%C3%A9%20par,22>.

<sup>20</sup> Stoop, N., Verpoorten, M., & Van Der Windt, P. (2019). Artisanal or industrial conflict minerals? Evidence from Eastern Congo. *World Development*, 122, 660-674.

manufacturing of electric vehicles, representing 55 percent of total cobalt importation in 2019.<sup>21</sup> Global demand is likely to double again by 2030,<sup>22</sup> in response to decarbonization challenges and the growing prevalence of digital technologies and battery-powered vehicles. In fact, the properties of cobalt provide industries with unprecedented energy storage for the mass production of rechargeable lithium-ion batteries (including cathode, anode, electrolyte, and separator) for smartphones, laptops computers, and other electronic devices. Electric vehicle batteries can have up to 20 kilograms of cobalt in each 100 kilowatt-hour pack,<sup>23</sup> and 8 grams are needed for a smartphone.<sup>24</sup> The Africa Business Forum 2021 reports that, “Electric vehicles represent a \$7 trillion market opportunity between today and 2030, and \$46 trillion between today and 2050.”<sup>25</sup> The estimated construction of 140 million electric vehicles for 2030 will therefore require 263,000 tonnes of cobalt,<sup>26</sup> of which 20 percent is expected to be extracted manually.

Cobalt mining activity occurs in three levels. At the primary level, industrialized operations largely excavate surface pits. At the secondary level, targeting (the mining of sediment containing weathering products) can include high-yield cobalt. Finally, leftover tailings and other scrap are also mined at the tertiary level.

Cobalt has been mined in the DRC since 1924, and today the DRC accounts for about 70 percent of the world's cobalt supply.<sup>27</sup> Cobalt is mined in the Central African Copperbelt, defined by the Katanga sedimentary basin of southern DRC and northern Zambia.<sup>28</sup> The southern DRC provinces in the Copperbelt are Lualaba and Haut-Katanga, and most cobalt mined in the DRC comes from these two provinces (see maps in Appendix C).<sup>29</sup> Initially derived as a by-product from secondary sediments, cobalt is obtained from nickel and copper mining and smelting. In 2021, DRC produced an estimated 120,000 metric tonnes of cobalt.<sup>30</sup>

The political instability and civil wars of the 1990s prompted the decline of the Congolese industrial mining sector and spurred the expansion of artisanal copper and cobalt mining initiatives across the southeast of the Congolese territory. ASM sites proliferated due to easy access to mineralized areas and the ability to extract materials without machinery. An estimated 30 percent of cobalt production comes from these artisanal and small-scale mines, in which informal miners use their own tools and resources

---

<sup>21</sup> OECD. (2019). Interconnected supply chains: a comprehensive look at due diligence challenges and opportunities sourcing cobalt and copper from the Democratic Republic of the Congo. <https://mneguidelines.oecd.org/Interconnected-supply-chains-a-comprehensive-look-at-due-diligence-challenges-and-opportunities-sourcing-cobalt-and-copper-from-the-DRC.pdf>; USGS. Cobalt Statistics and Information. Accessed October 2022. <https://www.usgs.gov/centers/national-minerals-information-center/cobalt-statistics-and-information>.

<sup>22</sup> Holman, Jacqueline. (2020). “Cobalt demand set to roughly double by 2030: Roskill.” S&P Global. <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/metals/120120-cobalt-demand-set-to-roughly-double-by-2030-roskill>

<sup>23</sup> Energy.gov. Reducing Reliance on Cobalt for Lithium-ion Batteries. April 6, 2021. <https://www.energy.gov/eere/vehicles/articles/reducing-reliance-cobalt-lithium-ion-batteries>.

<sup>24</sup> NPR. Cobalt: Rare and Everywhere. March 6, 2018. <https://www.npr.org/transcripts/591264651#:~:text=And%20when%20you%20put%20it,of%20cobalt%20in%20your%20cellphone>.

<sup>25</sup> Songwe, Vera. Remarks at the ECOSOC Special Meeting on Natural Resources, Peaceful Societies and Sustainable Development: Lessons from the Kimberley Process. Session on “Leveraging natural resources for peaceful societies and sustainable development” March 18, 2022. [https://www.un.org/ecosoc/sites/www.un.org.ecosoc/files/files/ECA\\_18March2022\\_ECOSOC%20Special%20Meeting.pdf](https://www.un.org/ecosoc/sites/www.un.org.ecosoc/files/files/ECA_18March2022_ECOSOC%20Special%20Meeting.pdf)

<sup>26</sup> Behrmann, Elisabeth et al. (2019). China Is Already Winning the Next Great Race in Electric Cars. Bloomberg. <https://www.bqprime.com/view/victory-in-electric-cars-depends-on-recycling-so-far-china-s-winning> <https://www.bloomberg.com/news/articles/2019-08-30/victory-in-electric-cars-depends-on-recycling-so-far-china-s-winning#xj4y7vzkg>.

<sup>27</sup> USGS. Mineral Commodity Summaries 2022 – Cobalt. <https://pubs.usgs.gov/periodicals/mcs2022/mcs2022-cobalt.pdf>.

<sup>28</sup> Taylor, Cliff et al. (20013). Descriptive models, grade-tonnage relations, and databases for the assessment of sediment-hosted copper deposits: with emphasis on deposits in the Central Africa Copperbelt, Democratic Republic of the Congo and Zambia: Chapter J in *Global mineral resource assessment*. US Geological Survey. [https://pubs.er.usgs.gov/publication/sir20105090#:~:text=The%20Central%20African%20Copperbelt%20\(CACB,\(DRC\)%20and%20northern%20Zambia](https://pubs.er.usgs.gov/publication/sir20105090#:~:text=The%20Central%20African%20Copperbelt%20(CACB,(DRC)%20and%20northern%20Zambia).

<sup>29</sup> Reuters. Cobalt-rich Congo province to centralise mineral sales. June 25, 2020. <https://www.reuters.com/article/us-congo-mining/cobalt-rich-congo-province-to-centralise-mineral-sales-idUSKBN23W2YZ>

<sup>30</sup> Statista. Cobalt mine production in the Democratic Republic of Congo 2010-2021. April 14, 2022. <https://www.statista.com/statistics/339834/mine-production-of-cobalt-in-dr-congo/>.

to extract the mineral.<sup>31</sup> The production of cobalt from ASM sites in DRC represents the second-largest cobalt-mining sector in the world after LSM production in DRC.<sup>32</sup>

There have been efforts to formalize the artisanal mining sector through creation of *zones d'exploitation artisanale* (ZEAs, or artisanal mining zones). ZEAs are run by cooperatives that have formal governmental registration and tax requirements, and miners who work in ZEAs are registered to these cooperatives. Many ZEAs are located on or adjacent to industrial mine sites. Industrial mine sites are divided into many categories, including small mines.

The landscape of the use of mechanized versus manual labor for ore extraction is complex and varies by site. Each site has a series of players and ownership interests. For example, one company may hold the official mining concession, another company might have operational control, and yet another company might employ the subcontractors. Within the main large-scale mines, more than half of miners are hired through subcontractors rather than being directly employed by the mining companies.<sup>33</sup> These hiring mechanisms avoid the forms of social protection that would provide workers with decent working and living conditions; this subcontracting model provides cheap labor while eroding workers' rights and increasing the risk of poor working conditions.<sup>34</sup>

Workers are further put at risk by China's role in the cobalt mining sector in the DRC. As of 2021, 70 percent of DRC's mining sector was controlled by Chinese investments,<sup>35</sup> and 15 out of 19 cobalt-producing mines in the region are China-owned or managed by Chinese investors.<sup>36</sup> An estimated 90 percent of cobalt from DRC is further refined and processed in China, which controls the majority of refined global cobalt output and supplies high-grade chemical cobalt to the international marketplace. The Chinese refining industry remains a major entry point for cobalt mined from DRC ASM sites into the supply chain.<sup>37</sup> The increased Chinese activity in the region is reported to have generated tensions between Chinese and Congolese workers. Some Congolese miners at Chinese-owned mines refer to forms of systemic discrimination, physical mistreatment, requirements to undertake dangerous tasks, and dismissal without pay.<sup>38</sup>

### 1.2.3. Forced labor in cobalt mining in the DRC

While human rights abuses, including the recruitment of children in armed conflict and forced labor in artisanal mining, are widely documented in the DRC's eastern provinces, a review of the literature found few studies specifically focused on forced labor in cobalt mining in the DRC's southern Copperbelt region.<sup>39</sup> There have been some media reports of forced labor in cobalt mining, and a high-profile case brought before the District of Columbia District Court in 2019 alleged that forced child labor occurred

---

<sup>31</sup> World Economic Forum. (2020). Making Mining Safe and Fair: Artisanal cobalt extraction in the Democratic Republic of the Congo. August 2020. [https://www.unige.ch/gsem/files/3416/0036/1727/89268\\_Making\\_Mining\\_Safe\\_V5.pdf](https://www.unige.ch/gsem/files/3416/0036/1727/89268_Making_Mining_Safe_V5.pdf).

<sup>32</sup> World Economic Forum. (2020). Making Mining Safe and Fair: Artisanal cobalt extraction in the Democratic Republic of the Congo September 2020. [https://www3.weforum.org/docs/WEF\\_Making\\_Mining\\_Safe\\_2020.pdf](https://www3.weforum.org/docs/WEF_Making_Mining_Safe_2020.pdf).

<sup>33</sup> RAID. (2021). The Road to Ruin? Electric vehicles and workers' rights abuses at DR Congo's industrial cobalt mines. [https://media.business-humanrights.org/media/documents/report\\_road\\_to\\_ruin\\_evs\\_cobalt\\_workers\\_nov\\_2021.pdf](https://media.business-humanrights.org/media/documents/report_road_to_ruin_evs_cobalt_workers_nov_2021.pdf).

<sup>34</sup> Ibid. See also Sovacool, Benjamin. (2021). When subterranean slavery supports sustainability transitions? Power, patriarchy, and child labor in artisanal Congolese cobalt mining. *The Extractive Industries and Society*, 8, 1, 271-293. <https://doi.org/10.1016/j.exis.2020.11.018>. Rubbers, Benjamin. (2019). Mining towns, enclaves and spaces: A genealogy of worker camps in the Congolese copperbelt. *Geoforum*, 98, 88-96. <https://doi.org/10.1016/j.geoforum.2018.10.005>.

<sup>35</sup> Ross, A., & Strohecker, K. (2021). EXCLUSIVE Congo reviewing \$6 bln mining deal with Chinese investors -finmin. Reuters. <https://www.reuters.com/world/africa/exclusive-congo-reviewing-6-bln-mining-deal-with-chinese-investors-finmin-2021-08-27/>.

<sup>36</sup> Narang, A. (2022). Congo kicks out Chinese company from one of the world's biggest copper-cobalt mining sites. TFI Global. <https://tfiglobalnews.com/2022/03/02/congo-kicks-out-chinese-company-from-one-of-the-worlds-biggest-copper-cobalt-mining-site/>.

<sup>37</sup> The Faraday Institution. (2020). Building a Responsible Cobalt Supply Chain. <https://faraday.ac.uk/wp-content/uploads/2020/05/Insight-cobalt-supply-chain1.pdf>.

<sup>38</sup> Thomas, D. African News. November 9, 2021.

<https://african.business/2021/11/energy-resources/workers-report-colonial-era-abuse-at-congolese-cobalt-mines/>

<sup>39</sup> Faber, B., et al. (2017). Artisanal Mining, Livelihoods, and Child Labor in the Cobalt Supply Chain of the Democratic Republic of Congo. CEQA. [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).

in cobalt mining in the DRC.<sup>40</sup> Technology companies, including Apple and Google, were named in the lawsuit, and the court dismissed the lawsuit for lack of standing and without factual findings on the forced labor conditions asserted by the plaintiffs.<sup>41</sup>

Serious labor rights violations have been revealed by studies conducted in five industrial mines in DRC, including Chinese-owned mines: Kamoto Copper Company, Metalkol Roan Tailings Reclamation, Tenke Fungurume Mining, La Sino-Congolaise des Mines (Sicomines), and Deziwa Mining Company (Somidez).<sup>42</sup> Some adult workers are reported to be working in extreme hardship at the cost of their own lives, without sufficient breaks, and for wages as low as \$2 per day, while using their own tools, primarily their hands.<sup>43</sup> Subcontracted miners reported working under exploitative labor conditions and having pay agreements regularly violated.<sup>44</sup> Workers face continuous abusive treatment, systematic violence, racism, ethnic violence, a dangerous working environment, and the absence of basic health provisions.<sup>45</sup> These normalized forms of abuse in both LSM and ASM remain largely unaddressed by Congolese labor inspectors, with recurrent reports of miners being “beaten with sticks, insulted, shouted at, or pulled around by their ears.”<sup>46</sup>

Risks of human rights violations in ASM is particularly high. Miners are often mistreated, experience racism and gender-based discrimination, are exposed to chemically toxic environments, and lack basic health provisions.<sup>47</sup> Whether in extraction sites or in neighboring villages, women are highly vulnerable to sexual harassment and often undertake arduous and poorly paid activities. Women tend to be allocated crucial roles in cleaning, processing, transporting, and trading materials. However, illegal intrusions of artisanal miners onto concessions often create tensions between local communities and mining companies. Military officers and LSM security are reported to physically assault artisanal miners who, not having been granted access to artisanal mining zones, clandestinely trespass onto official extraction sites.<sup>48</sup> With almost no labor oversight, labor exploitation is common in the sector. In particular, small-scale mining in the region is known to involve people of all ages, including children, who often work in deplorable conditions without protective equipment, sometimes inside pre-collapsing shafts, to bring mineral-encrusted rocks to the surface or collect minerals for exportation.<sup>49</sup>

The dearth of more detailed research on forced labor in the sector, including an absence of quantitative studies, highlights the need for greater research in this area.

---

<sup>40</sup> Case 1:19-cv-03737, December 15, 2019. United States District Court for the District of Columbia.

[https://regmedia.co.uk/2019/12/16/cobalt\\_lawsuit.pdf](https://regmedia.co.uk/2019/12/16/cobalt_lawsuit.pdf).

<sup>41</sup> Piontkovska, M., & Nguenang, D. (2021). US Court Dismissed Cobalt Mining Forced Labor Lawsuit Against Tech Companies. Global Supply Chain Compliance.

<https://supplychaincompliance.bakermckenzie.com/2021/11/18/us-court-dismissed-cobalt-mining-forced-labor-lawsuit-against-tech-companies/>.

<sup>42</sup> RAID. (2021). The Road to Ruin? Electric vehicles and workers' rights abuses at DR Congo's industrial cobalt mines. November 2021.

[https://media.business-humanrights.org/media/documents/report\\_road\\_to\\_ruin\\_evs\\_cobalt\\_workers\\_nov\\_2021.pdf](https://media.business-humanrights.org/media/documents/report_road_to_ruin_evs_cobalt_workers_nov_2021.pdf)[https://media.business-humanrights.org/media/documents/report\\_road\\_to\\_ruin\\_evs\\_cobalt\\_workers\\_nov\\_2021.pdf](https://media.business-humanrights.org/media/documents/report_road_to_ruin_evs_cobalt_workers_nov_2021.pdf)

<sup>43</sup> Lawson, M. (2021). The DRC Mining Industry: Child Labor and Formalization of Small-Scale Mining Wilson Center.

<https://www.wilsoncenter.org/blog-post/drc-mining-industry-child-labor-and-formalization-small-scale-mining>

<sup>44</sup> RAID. (2021). The Road to Ruin? Electric vehicles and workers' rights abuses at DR Congo's industrial cobalt mines. [https://media.business-humanrights.org/media/documents/report\\_road\\_to\\_ruin\\_evs\\_cobalt\\_workers\\_nov\\_2021.pdf](https://media.business-humanrights.org/media/documents/report_road_to_ruin_evs_cobalt_workers_nov_2021.pdf).

<sup>45</sup> RAID. (2021). The Road to Ruin? Electric vehicles and workers' rights abuses at DR Congo's industrial cobalt mines. [https://media.business-humanrights.org/media/documents/report\\_road\\_to\\_ruin\\_evs\\_cobalt\\_workers\\_nov\\_2021.pdf](https://media.business-humanrights.org/media/documents/report_road_to_ruin_evs_cobalt_workers_nov_2021.pdf).

<sup>46</sup> Ruiz Leotaud, V. (2021). Researchers link cobalt mining in the DRC to violence, substance abuse, food-water insecurity. Mining.com. <https://www.mining.com/researchers-link-cobalt-mining-in-the-drc-to-violence-substance-abuse-food-water-insecurity/>

<sup>47</sup> Jamasmie, C. (2019). Health and safety bigger risks to artisanal miners that conflict minerals — report. Mining.com.

<https://www.mining.com/health-and-safety-bigger-risks-to-human-rights-than-conflict-minerals-report/>

<sup>48</sup> Boko, H. (2021). DR Congo: Video of miners beaten for trespassing shows stranglehold of foreign mining interests. The Observers.

<https://observers.france24.com/en/africa/20210802-dr-congo-video-artisanal-miners-beaten-for-trespassing>.

<sup>49</sup> Tria, E. (2021). The impact of Covid-19 on child labour in cobalt mines in the DRC. Humanium.

<https://www.humanium.org/en/the-impact-of-covid-19-on-child-labour-in-cobalt-mines-in-the-drc/>.

## 2. STUDY DESIGN

### 2.1. Sampling methodology

The study was designed to select a sample of cobalt mine workers representative of all cobalt mine workers in Lualaba and Haut-Katanga.

The sampling frame for this study comes from population data available at the commune level for the purposes of establishing electoral districts for the 2011 election. The research team made some updates to the frame before proceeding because, due to the political instability in the country, there have been frequent changes in the boundaries and number of divisions of various administrative units at various levels. Some of these changes have been made bureaucratically but not changed formally by law, leaving their current status unclear. As noted in the *Section 4. Study Limitations*, these challenges impact the reliability of the population estimates used for weighting.

#### 2.1.1. Selection of sampling units

The research team conducted preliminary research with local leaders throughout the two provinces to determine whether cobalt mining takes place in or near (within five kilometers) each commune, which was required for commune selection eligibility. The team determined that 101 of the 235 communes have mining activity within their borders or nearby. Team members then randomly selected 18 of the 101 mining communes using probabilities proportional to size.

The study team conducted additional preliminary research to develop a list of all villages within each of the 18 selected communes. They contacted local leaders to determine whether mining activity takes place in or within five kilometers of each of the villages. Of the 1,362 villages in the 18 selected communes, 596 villages were determined to have mining activity within 5 kilometers, which was the eligibility condition for villages. After reviewing this list, researchers determined there were no eligible villages in two of the selected communes (Moero and Simba) and removed these communes from the sample.

The research team selected 4 mining villages at random (without probabilities proportional to size) from each of the remaining 16 communes, for a total of 64 villages. During fieldwork, it was discovered that six villages were inaccurately described as cobalt mining villages and did not actually have any cobalt mining nearby. As such, replaced these villages with six other mining villages randomly selected from the list of mining villages (restricted to villages in communes where data collection was not yet complete for logistical purposes).

With the exception of four villages in the northeast of Haut-Katanga (Kamabange, Kapulo Centre, Mushima, and Pembe) and one village in the south (Lonshi), all villages in the sample were between 0.75 and 34km away from a Chinese-associated cobalt mine or facility.<sup>50</sup> In turn, more than half of respondents lived in close proximity of a Chinese-associated cobalt mine or facility—within 5km and one hour walking—as measured by publicly-available data (see Limitations).<sup>51</sup> Chinese-associated sites used in the research included cobalt mines and processing facilities (i.e., smelters and refineries).

#### 2.1.2. Household selection

On arrival in each village, the field team worked with local leaders to create a list of all households with at least one adult involved in an activity related to mining. The list of households was numbered, and the

---

<sup>50</sup> With the exception of the five villages specified above, villages were an average of 9.7km from a Chinese-associated cobalt mine or facility.

<sup>51</sup> There is evidence that most miners live within 5km of their mining site. See, for example, CEGA (2017). Artisanal Mining, Livelihoods, and Child Labor in the Cobalt Supply Chain of the Democratic Republic of Congo. [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).

total number of eligible households was entered into the supervisor computer-assisted personal interviewing (CAPI) program. The program randomly selected household numbers, which were then matched to the list of households. If a household refused, was not available after three attempts, or contained no miners,<sup>52</sup> the household was replaced by the next unused household number on the list. Interviewers attempted interviews at an average of 16 households per village, for a total of 1,022 selected households.

### 2.1.3. Selection of respondents within households

The CAPI program first directed the interviewer to identify household members eligible to complete the mine worker questionnaire. Any adult (18+) household member familiar with the work of the household members could provide the list of eligible respondents. Any adult household members who have worked in the mining sector in the past year were eligible to complete the mine worker questionnaire. After the list of mine workers was complete, the CAPI program randomly selected one household member who worked in mining in the past year for interview. If the selected respondent was not available after three visits, he or she could be replaced by another eligible respondent within the household. The sampling approach did not set a target for respondent gender.



*Interview with a worker involved in cobalt mining activities*

### 2.1.4. Response rate and final sample

Most selected households chose to participate in the research. Of the 1,022 randomly selected mining households approached, interviewers completed interviews in 1,014 households (a 99 percent response rate). Two households refused, and the remainder did not have an available eligible respondent despite repeated visits. The within-household response rate was 94.5 percent; in 59 households, the selected respondent was either not available despite repeated visits (n=57) or refused (n=2) and was therefore replaced by another household member. The final sample size was 1,014 respondents, including 946 eligible cobalt mine workers, 64 non-cobalt mine workers (excluded from the estimates presented in Section 5. Findings; see Appendix E for a brief analysis of this sub-sample), and 4 ineligible cobalt mine workers who stopped working more than 1 year ago.

### 2.1.5. Weighting and estimation

The research team computed two sampling weights for the three stages of selection: (1) the sampling weights used to select communes were computed as reciprocal of the probability of selection for the commune, (2) the sampling weights for villages were computed as reciprocal of the probability of selection for the village, and (3) the sampling weights for households were computed as the reciprocal of

<sup>52</sup> Question text: Has at least one member of this household, age 18 or older, worked in mining or in an activity related to mining in the past year? [IF NEEDED: A household is a person or group of persons, related or unrelated, who normally cook, eat, and live together in the same dwelling unit, acknowledge one household head, and share living arrangements.]

As discussed in Section 4. Study Limitations, respondents may have had differing understandings of what constitutes “an activity related to mining.”



the probability of selection for each household within the selected village. Villages and households were selected using simple random sampling. The two provinces were design strata, and selection was independent in the two provinces. Within each province, the selection with probabilities proportional to size at the two stages, communes and villages, coupled with the selection of a constant number of households per village, leads to a sample with approximately equal probabilities of selection for households. Samples selected with equal probabilities of elements, or self-weighting samples, are more efficient statistically.

One eligible adult was selected within eligible households. We then computed overall sampling weights at the household and adult levels as the product of the component sampling weights. Weights were adjusted with post-stratification using population totals for the sectors in the two provinces. Table I presents the overall province totals for the two provinces. As the allocations were nearly proportional, unequal weighting effects were kept to a minimum, and so were the impacts on survey variances.

**Table I. Sampling summary**

Province	Selected villages	Sample sizes (individual respondents)	Total (adult) population
Haut-Katanga	44	703	560,788
Lualaba	20	312	254,719

## 2.2. Development of key measures and questionnaire

### 2.2.1. Operationalizing the definition of forced labor

The questionnaire used in this study (available in *Appendix B*) was adapted from other forced labor studies that ICF has conducted in Nepal and Suriname,<sup>53</sup> as well as questions from the ILO SIMPOC questionnaires.<sup>54</sup> The first step in the original questionnaire development was to create a list of indicators from the definition of forced labor in the ICLS guidelines. To contextualize the instrument to this study, any indicators that were irrelevant to the mining sector in the DRC were removed.<sup>55</sup>

Indicators of menace of penalty included limited freedom of movement and coercion related to debt bondage, achieving daily quotas, overtime, hazardous work, having to work for other employers, and inability to quit the job. Forms of coercion included being arrested or prosecuted, threats of violence against the respondent or respondent’s family, dismissal or threats of dismissal, denial or withholding of rights or privileges or wages, withholding of valuable documents, causing family to lose access to land or other resources, attempting to prevent other employers from hiring the respondent, and manipulation related to debt.

Indicators of involuntariness included work of a different nature than promised without consent, lower earnings than promised, degrading living conditions, insufficient wages defined as below minimum wage, inability to refuse to work in hazardous conditions, being required to work for other employers without consent, involuntary excessive overtime, and inability to quit the job without consequences imposed by the employer.

The questionnaire included questions matched to each indicator. In addition to the ICLS guidelines, the following studies and instruments provided guidance during the development of the questionnaire items:

<sup>53</sup> ICF International. Children working in the carpet industry in India, Nepal and Pakistan: Summary report of the Carpet Research Project. May 2012. [https://ecommons.cornell.edu/bitstream/handle/1813/79465/ILAB\\_Summary\\_Report.pdf](https://ecommons.cornell.edu/bitstream/handle/1813/79465/ILAB_Summary_Report.pdf); ICF International. Child labor in the small-scale gold mining industry in Suriname. 2012. <https://www.dol.gov/agencies/ilab/child-labor-small-scale-gold-mining-industry-suriname>

<sup>54</sup> International Labor Organization. SIMPOC questionnaires for stand-alone national child labour surveys. July 2007.

[https://www.ilo.org/ipec/Informationresources/WCMS\\_IPEC\\_PUB\\_4946/lang--en/index.htm](https://www.ilo.org/ipec/Informationresources/WCMS_IPEC_PUB_4946/lang--en/index.htm)

<sup>55</sup> For example, background research indicated that “unfree recruitment at birth or through transaction such as slavery or bonded labour” is not known to occur in the cobalt mining sector in DRC.

- Improving Human Trafficking Victim Identification—Validation and Dissemination of a Screening Tool (U.S. Department of Justice, 2014)<sup>56</sup>
- Food and Beverage Tool 07: Protections Against Trafficking in Persons: Conducting Migrant Worker Interviews (Responsible Sourcing Tool, n.d.)<sup>57</sup>
- Forced Labor in the Production of Electronic Goods in Malaysia (Verité, 2014)<sup>58</sup>
- Hard to See, Harder to Count: Survey Guidelines to Estimate Forced Labour of Adults and Children (ILO, 2012)<sup>59</sup>

The study team adapted some previously used survey measures, and in cases for which measures were not available or appropriate, researchers wrote survey questions that addressed key constructs most directly. The questionnaire was formatted as a spreadsheet in which each response category was tied to a forced labor indicator, differentiating between menace of penalty and involuntary work indicators. (See *Appendix A* for a list of indicators and the statistical definition of each indicator.) Any case with both an indicator of menace of penalty and an indicator of involuntary work was considered to be a case of forced labor.

### 2.2.2. CAPI program

The worker questionnaire was designed for interviewer administration using tablets. The CAPI program guided the interviewer through the questionnaire by automatically applying skips and filters. The program also included response constraints where relevant to improve data quality. The questionnaires were programmed using SurveyCTO and administered using Android tablets.

---

<sup>56</sup> Simich, L., et al.(2014). Improving Human Trafficking Victim Identification - Validation and Dissemination of a Screening Tool.

<https://www.ojp.gov/pdffiles1/nij/grants/246712.pdf> . <https://www.ojp.gov/pdffiles1/nij/grants/246712.pdf>

<sup>57</sup> Responsible Sourcing Tool. Protections Against Trafficking in Persons: Conducting Migrant Worker Interviews. Accessed October 26, 2022. <https://www.responsiblesourcingtool.org/uploads/47/RST-Food-and-Bev-Tool-07-Conducting-Migrant-Worker-Interview.pdf>.

<sup>58</sup> Verite. (2014). Forced Labor in the Production of Electronic Goods In Malaysia: A Comprehensive Study of Scope and Characteristics. <https://www.verite.org/wp-content/uploads/2016/11/VeriteForcedLaborMalaysianElectronics2014.pdf>.

<sup>59</sup> ILO. (2012). Hard to see, harder to count Survey guidelines to estimate forced labour of adults and children. Geneva: ILO. [https://www.ilo.org/wcmsp5/groups/public/---ed\\_norm/---declaration/documents/publication/wcms\\_182096.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---declaration/documents/publication/wcms_182096.pdf).

## 3. STUDY IMPLEMENTATION

### 3.1. Ethical considerations

We obtained ethical approvals from the ICF Institutional Review Board and from the DRC National Committee of Health Ethics (Comité National d'Éthique de la Santé) prior to the start of fieldwork. Respondents received \$3 cash in appreciation of their time.

#### 3.1.1. Informed consent

Interviewers read a consent statement to all respondents, which included detailed information about the study, objectives, risks, and benefits, and emphasized voluntary participation. Respondents could ask questions and were assured of confidentiality before the interview continued. The CAPI program prompted interviewers to record whether the respondent consented to participate. Interviewers then continued with the interview if the respondent provided consent.

### 3.2. Training and preparation activities

Prior to the start of training and fieldwork, ICF developed a field procedure manual. The manual was used for the survey training and to provide guidance to interviewers and supervisors on field procedures. The manual described the study design and goals and the role and responsibility of interviewers. It provided guidance for conducting an interview and building rapport with respondents. The manual included detailed instructions for selecting households and respondents, ensuring data quality, and conducting the interview.



*Field team training in Lubumbashi, DRC*

Marakuja conducted field team training from July 31 to August 4, 2022. An ICF representative provided on-site technical support and guidance during training and early fieldwork. During the training, the survey leadership introduced the study design and its objectives and discussed general interviewing techniques and expectations of staff. There was a substantial emphasis on ethics, with discussions of the consent process and procedures for maintaining confidentiality. The field team learned to use the CAPI program developed by ICF for data entry and for household selection. The training also included a discussion of respondent and household

selection and a question-by-question discussion of the questionnaire.

Following training, interview team members conducted a one-day pre-test with mine workers in an area not selected for the study. After the pre-test, the survey leadership and field team met for debriefing and feedback. During the debriefing, the field team identified and corrected a few remaining issues in the translation of the questionnaire and in the programming of the skip patterns. The research team also revised some response categories based on the pre-test participant responses. The questionnaire was updated and finalized after the pre-test.

### 3.3. Data collection

Data collection took place from August 6 to August 22, 2022. The field team included 30 interviewers, 6 supervisors, 3 field managers, and 2 team leaders.



*Field team members deploy to interview sites*

#### 3.3.1. Data quality control

To ensure high-quality data, supervisors were instructed to observe at least 10 percent of interviews conducted by their team. Supervisors and quality controllers regularly reviewed completed questionnaires and provided feedback to interviewers. ICF also conducted quality control checks on the data during the fieldwork period and found no irregularities. The CAPI program recorded interview dispositions, including refusals and mid-interview dropouts and reasons. Study leadership regularly aggregated and reviewed the disposition data to ensure that work was distributed appropriately among interviewers and that the number of refused or incomplete interviews was reasonable.

## 4. STUDY LIMITATIONS

There are several limitations related to sampling. First, as discussed in *Section 2.1. Sampling methodology*, the lack of recent population data for the DRC may reduce the accuracy of the weights used, and relatedly, the resulting weighted estimates. Second, the study team relied on local leadership to identify mining communes, mining villages within communes, and mining households within villages. The resulting lists may have been incomplete or have included inaccuracies, depending on the knowledge level of the informants or other factors.<sup>60</sup>

Third, because initial scoping research indicated that the majority of mine workers live within five kilometers of a mine site, the research team opted to only include those villages that are within five kilometers of a mine site in the sample. The smaller proportion of villages (and workers in those villages) farther than five kilometers away from mine sites were not included in this study and may have different characteristics. Initial scoping research also indicated that most mine workers live in villages or in temporary camps near mines, but a small percentage live within gated compounds of industrial mines. The research team were not able to access these gated compounds, so the small proportion of workers who live within them were excluded from the study.

A related limitation concerns the unclear definition of “mining activity.” Local leaders were asked to identify all households with at least one adult involved in an activity related to mining. The screening question in the questionnaire asks, “Has at least one member of this household, age 18 or older, worked in mining or in an activity related to mining in the past year?” At neither point did researchers routinely define “an activity related to mining.” Leaders and household members may have assumed that the study concerns only those personally engaged in digging and excluded those in auxiliary roles. These auxiliary roles (e.g., sorting and washing minerals and providing food, water, and services to mine workers) are often filled by women.<sup>61</sup> As a result, this study may underestimate the proportion of women in auxiliary roles related to cobalt mining. The study did not ask targeted questions on commercial sexual exploitation.

The questionnaire included a binary question to determine whether a respondent worked for an employer (“Do you work for an employer or for yourself?”). As currently constructed, most questions related to the indicators of forced labor are more applicable to employed workers and less applicable to self-employed workers. Many miners consider themselves to be entrepreneurs, and, relatedly, many of our respondents identified as “self-employed.” The CAPI program directed the interviewers to skip these questions<sup>62</sup> for self-employed respondents. This structure did not allow us to capture information about other agents who might exert control over independent mine workers, such as traders (*negociants*), mine worker associations, or mine site leadership. It is highly likely there are elements of involuntariness and coercion in these relationships, such as debt bondage;<sup>63</sup> therefore, the estimate of forced labor in this study should be considered a highly conservative estimate.

---

<sup>60</sup> Other factors here may include informants withholding information about mining activities in the region due to concerns about economic or political consequences of participating in research, or the content of informants’ reports being influenced by conscious or unconscious bias.

<sup>61</sup> Women’s International League for Peace and Freedom. (2016). Life at the bottom of the chain: women in artisanal mines in DRC. [https://wilpf.org/wp-content/uploads/2016/10/WomenInArtisanalMinesInDRC\\_web.pdf](https://wilpf.org/wp-content/uploads/2016/10/WomenInArtisanalMinesInDRC_web.pdf).

Niarchos, N. (2021). The dark side of Congo’s cobalt rush. *The New Yorker*. <https://www.newyorker.com/magazine/2021/05/31/the-dark-side-of-congos-cobalt-rush>

<sup>62</sup> For example:

S2.Q3. Were you free to refuse to work for this employer?

S5.Q14. Does your employer require you to work for other employers without your agreement?

S5.Q19. What might happen if you refused to work overtime?

S5.Q23. If you decide (decided) to stop working with this employer, can (could) you leave without negative consequences by your employer?

<sup>63</sup> There are reports that forced labor in the ASM sector may include debt bondage, as miners borrow from intermediaries (for tools, equipment, and food) at high interest rates, and are subsequently and forced to “work off” the debt through cobalt mining. See RCS Global Group. (2022). Cobalt Supply Chain Mapping Report. Supply Chains Tracing Project FOA-ILAB-20-04. <https://www.elevatelimited.com/wp-content/uploads/2022/08/RCS-GTP-Cobalt-Supply-Chain-Mapping-Report-May-2022.pdf>.

The study did not assess whether respondents worked in the LSM or ASM sector, but rather asked respondents to report the type of mine site at which they worked.<sup>64</sup> Consequently, the study reports estimates for “workers at LSM sites” for workers who reported that their work site was a large-scale or industrial mine site, and “workers at ASM sites” for workers who reported that their work site was an artisanal or small-scale/semi-industrial site. Some respondents reporting work at LSM sites performed ASM activities, such as digging for ore without tools. As such, the estimates for workers at ASM versus LSM sites should not be interpreted as estimates for workers in the ASM sector versus LSM sector. As a household survey, the research did not visit mine sites or verify the legal status of mining operations.

As noted in *Section 1.2 Background*, Chinese investments in the DRC’s cobalt industry are widespread and have been linked with adverse labor conditions in the LSM and ASM sectors. The study drew on publicly-available data to identify Chinese-associated cobalt mines and facilities.<sup>65</sup> A list of over 30 Chinese-associated cobalt mines and facilities was prepared. When combined with the worker survey data, the most common mine sites in proximity to workers were the Ruashi, Kasulo, and Kimpe cobalt mines; the list also included the Luisha mine, Kolwezi mine, Tenke Fungurume mine, Dikuluwe mine, and processing facilities in Lubumbashi. Given the opacity of ownership in the cobalt mining industry in DRC, this is an incomplete list. The study presents data on respondents who live in close proximity to Chinese-associated mines, but respondents were not asked to identify the specific mine site at which they worked.

---

<sup>64</sup> This following question (S1Q16) was read aloud verbatim to the respondent with no additional instructions or definitions: “What type of mine site do you work at? Is it artisanal, small scale, or industrial?”

<sup>65</sup> Sources included, but were not limited to: USGS. 2017-2018 Minerals Yearbook: Congo (Kinshasa). <https://pubs.usgs.gov/myb/vol3/2017-18/myb3-2017-18-congo-kinshasa.pdf>; Federal Institute for Geosciences and Natural Resources (2021). Mining Conditions and Trading Networks in Artisanal Copper-Cobalt Supply Chains in the Democratic Republic of the Congo. [https://www.bgr.bund.de/EN/Themen/Min\\_rohstoffe/Downloads/lieferketten\\_abbaubedingungen\\_artisanaler\\_Cu-Co-Sektor\\_DR\\_Kongo\\_en.pdf?\\_\\_blob=publicationFile&v=3](https://www.bgr.bund.de/EN/Themen/Min_rohstoffe/Downloads/lieferketten_abbaubedingungen_artisanaler_Cu-Co-Sektor_DR_Kongo_en.pdf?__blob=publicationFile&v=3); Huderek, Richard. Katangan Copperbelt. [https://www.google.com/maps/d/embed?mid=1UaZsL2myAOXXO3\\_ymWcle-l3myY&hl=en\\_US&ehbc=2E312F](https://www.google.com/maps/d/embed?mid=1UaZsL2myAOXXO3_ymWcle-l3myY&hl=en_US&ehbc=2E312F). Accessed on January 31, 2023.

## 5. FINDINGS

This section provides an analysis of respondent background characteristics and job characteristics, and the prevalence and characteristics of forced labor, recruitment experiences, and working experiences.

All estimates were calculated using survey weights and are representative of adults working in cobalt mining-related activities in Haut-Katanga and Lualaba in the past 12 months. Standard errors (SE) are presented for all estimates. Missing responses (“don’t know” and “refused”) are excluded from the denominator for all estimates. **The background and forced labor tables show the unweighted number of respondents in each category (i.e., the numerator, denoted by “n”). The remaining tables show the unweighted number of respondents included in the estimate calculation (i.e., the denominator, denoted by “N”).** While sample estimates equal n divided by N, weighted estimates do not equal n divided by N because they have been adjusted to represent the population. For the sample characteristics tables, an “x” denotes a cell sample size of less than 10; estimates have been suppressed in these cells.

Most estimates are presented for all respondents and by type of mining site.<sup>66</sup> Tables presenting estimates by mining site use column percentages, meaning that they show the percentage of workers in each row among those who work at the type of mine site indicated in that column.

### 5.1. Sample characteristics

This section presents the demographic characteristics of respondents as well as the characteristics of their most recent jobs in cobalt mining. Both tables in this section include the number of respondents in each category (i.e., indicator numerator, denoted by “n”) as well as the estimated proportion of the overall cobalt miner population and the SE.

Nearly three-fourths of workers (72 percent) work at ASM sites, and 28 percent work at LSM sites (Table 2).<sup>67</sup>

**Table 2. Type of mine site (weighted)**

	% (SE)	n
ASM	71.6% (8.6)	626
LSM	28.4% (8.6)	319
<b>Number of respondents (N)</b>		<b>945</b>

Table 3 provides demographic characteristics of workers. More than half of all workers (56 percent) are aged 25 to 39. One-fourth (24 percent) are aged 18 to 24, 16 percent are aged 40 to 54, and just 4 percent are 55 or older. On average, workers at ASM sites are younger than those at LSM sites (31.6 years for ASM and 33.9 for LSM). The majority of workers (97 percent) at both types of mine sites are male. Three-fourths of workers (76 percent) are the head of their own household, and 12 percent are a son of the head of the household. Three-fourths of workers (72 percent) are married or co-habiting, 6 percent are divorced, and 21 percent have never been married or lived with a partner.

<sup>66</sup> The sample size (n) for the workers at ASM and LSM sites may not add up to the total sample size because one respondent selected “don’t know” for the mine site question.

<sup>67</sup> Throughout the findings, the results are presented separately for workers at ASM and LSM sites where sample size allows.

Half of workers (52 percent) were born in Haut-Katanga, 16 percent in neighboring Haut-Lomami, and 13 percent in Lualaba. One-fifth of workers (20 percent) were born elsewhere in the DRC, most commonly Tanganyika, Kasai-Oriental, and Lomami, all located in southern DRC. Only two respondents were born outside of the DRC. Almost half of workers (45 percent) were born outside of the province where they currently work. Almost twice as many of those working in Lualaba were born outside their province of work (64 percent), compared to those working in Haut-Katanga (36 percent).

There is considerable variation in tribe. The most common tribes of workers are Lube-Katanga (25 percent), Bemba (12 percent), and Luba-Kasai (12 percent). Half of workers (54 percent) are Protestant Christians, 16 percent are Catholic Christians, and 15 percent are adherents of the Revival Church.

The vast majority (79 percent) of workers have at least some formal education. One-third (32 percent) completed secondary school or higher, 47 percent have at least some secondary school, 8 percent completed primary only, 11 percent completed some primary, and 2 percent had not attended any primary school. A much higher proportion of workers at LSM sites (49 percent) completed secondary school or higher compared to workers at ASM sites (26 percent). This is likely because LSM jobs often have qualification requirements, and ASM work can be undertaken by anyone.



*Interview with a worker involved in cobalt mining*

**Table 3. Respondent background characteristics by type of mine site (weighted)**

	ASM		LSM		Total % (SE)	Total n
	% (SE)	n	% (SE)	n		
<b>Age (years)</b>						
18–24	22.4% (4.8)	181	29.1% (6.0)	47	24.3% (4.0)	228
25–39	61.2% (6.0)	337	44.2% (4.0)	124	56.4% (5.4)	462
40–54	14.3% (2.6)	95	18.5% (4.3)	67	15.5% (2.2)	162
55+	2.0% (0.4)	13	8.3% (3.9)	81	3.8% (1.2)	94
<b>Gender</b>						
Male	96.7% (1.7)	596	96.7% (1.8)	303	96.7% (1.3)	900
Female	3.3% (1.7)	29	3.3% (1.8)	16	3.3% (1.3)	45
<b>Relationship to head of household</b>						
Household head	75.9% (5.2)	449	74.4% (3.4)	242	75.4% (3.5)	692
Son	11.2% (2.1)	69	14.2% (5.4)	23	12.0% (2.0)	92
Father	1.8% (1.2)	14	2.7% (1.5)	23	2.0% (1.0)	37
Other	12.8% (3.7)	94	10.8% (3.7)	31	12.2% (2.9)	125
<b>Marital status</b>						
Married or co-habiting	72.4% (3.6)	419	72.5% (3.4)	238	72.4% (2.7)	658
Divorced or separated	6.5% (1.6)	31	5.2% (2.2)	13	6.1% (1.5)	44
Widowed	x		1.5% (1.0)	12	0.7% (0.3)	19
Never married and never lived with anyone	20.8% (3.0)	169	20.8% (2.7)	56	20.8% (2.4)	225



	ASM		LSM		Total	Total
	% (SE)	n	% (SE)	n	% (SE)	n
<b>Origin</b>						
Haut-Katanga	52.0% (7.4)	350	50.9% (11.2)	158	51.7% (7.2)	508
Haut-Lomami	17.0% (3.5)	71	12.7% (7.8)	31	15.8% (4.0)	103
Lualaba	12.5% (6.5)	90	12.7% (5.1)	67	12.5% (5.2)	157
Elsewhere in DRC	18.5% (2.8)	115	23.6% (3.2)	61	19.9% (2.5)	176
<b>Born outside province of current work<sup>1</sup></b>						
Total	44.0% (5.3)	241	46.9% (9.5)	146	44.9% (5.9)	388
Works in Haut-Katanga	35.8% (4.8)	135	28.6% (2.4)	70	34.0% (3.8)	205
Works in Lualaba	63.5% (7.3)	106	74.2% (2.7)	76	67.3% (6.3)	183
<b>Tribe</b>						
Luba-Katanga	24.8% (3.1)	155	24.5% (5.9)	82	24.7% (3.5)	237
Bemba	13.2% (2.8)	65	10.3% (3.6)	21	12.4% (2.5)	86
Luba-Kasai	12.7% (3.0)	63	8.5% (1.1)	27	11.5% (2.2)	90
Kasai, Katanga, Tanganyika	7.7% (1.3)	76	14.6% (4.5)	37	9.8% (2.0)	114
Sanga	9.3% (1.3)	51	10.1% (4.0)	30	9.6% (1.5)	81
Other	32.3% (1.4)	214	31.9% (3.5)	118	32.1% (1.8)	332
<b>Religion</b>						
Protestant	53.7% (3.1)	354	53.2% (4.3)	183	53.6% (3.2)	538
Catholic	15.4% (3.6)	97	18.7% (4.0)	49	16.4% (3.0)	146
Revival Church	14.0% (2.7)	93	17.3% (3.3)	44	15.0% (2.7)	137
New Apostolic Church	2.6% (0.9)	15	x		2.5% (0.6)	24
Other	14.2% (2.2)	65	8.4% (2.2)	32	12.5% (2.0)	97
<b>Educational attainment</b>						
No formal schooling <sup>2</sup>	2.1% (1.2)	15	x		1.6% (0.9)	17
Some primary	12.9% (2.9)	80	7.7% (2.2)	19	11.4% (2.4)	99
Completed primary	9.1% (1.8)	49	5.0% (1.3)	12	7.9% (1.3)	61
Some secondary	49.9% (2.5)	317	38.4% (10.0)	117	46.6% (3.0)	435
Completed secondary or higher	26.1% (4.5)	165	48.5% (9.9)	169	32.4% (4.1)	334
<b>Number of respondents (N)</b>						946 <sup>3</sup>

<sup>1</sup> Assumes province of survey administration is province of work

<sup>2</sup> Includes one respondent who attended preschool only

<sup>3</sup> N is smaller for some items with missing data: Gender N=945; Origin N=944; Born outside province of current work N=944; Tribe N=940; Religion N=942

Table 4 presents job characteristics by type of mine site. Overall, most mine workers (72 percent) are self-employed. Self-employment is much more common among workers at ASM sites (95 percent) than it is among workers at LSM sites (15 percent). To be eligible for the survey, respondents must have worked in cobalt mining within the past year. A small proportion of workers stopped working within the past year (7 percent), but the majority (93 percent) continue to work in cobalt mining. The length of the time workers have been in their current or most recent job in cobalt mining varies. One-third (35 percent) have been in the job for less than 2 years, 13 percent for 3 to 4 years, 22 percent for 5 to 9 years, 23 percent for 10 to 19 years, and 8 percent for 20 or more years. LSM sites have many more new workers of less than 2 years, compared to ASM sites.

**Table 4. Job characteristics by type of mine site (weighted)**

	ASM		LSM		Total % (SE)	Total n
	% (SE)	n	% (SE)	n		
<b>Works for employer or self (%)</b>						
Employer	5.5% (3.1)	48	84.6% (12.1)	291	28.0% (8.7)	340
Self	94.5% (3.1)	578	15.4% (12.1)	28	72.0% (8.7)	606
<b>Currently engaged in cobalt mining (%)</b>	93.2% (2.9)	576	92.2% (3.2)	288	92.9% (2.4)	864
<b>Length of time in job (%)</b>						
≤2 years	22.0% (5.3)	176	66.4% (10.3)	136	34.6% (7.8)	312
3–4 years	15.6% (2.8)	95	7.2% (2.1)	32	13.2% (2.5)	127
5–9 years	25.4% (1.7)	160	11.4% (3.4)	39	21.5% (2.5)	200
10–19 years	28.7% (5.8)	145	7.4% (3.2)	26	22.6% (4.8)	171
20+ years	8.3% (1.6)	50	7.6% (4.9)	86	8.1% (1.9)	136
<b>Number of respondents (N)</b>						946

Currently employed workers were asked whether they engage in each activity in a list of mining activities (Table 5). Workers engage in an average of 2 mining activities, with those at ASM sites engaging in slightly more activities (2.2) on average, compared to those at LSM sites (1.6).<sup>68</sup> Workers were then asked to indicate the primary mining activity in which they engage. The primary mining activities for workers at ASM versus LSM sites are notably different. The only primary activity commonly performed by workers at both types of sites is digging for ore without machines, but it is a much more frequent primary activity for those at ASM sites (70 percent), compared to those at LSM sites (14 percent). Other primary activities for workers at ASM sites include buying or selling excavated materials (7 percent), crushing rocks (6 percent), and washing materials (6 percent). The other most common primary activities for workers at LSM sites are cleaning or preparing tools or workspaces (24 percent), digging ore using machines (15 percent), and supervising mine workers (12 percent).

**Table 5. Job characteristics by type of mine site among currently employed miners (weighted)**

	ASM		LSM		Total % (SE)	Total n
	% (SE)	n	% (SE)	n		
<b>Number of mining activities</b>	2.2 (0.2)	576	1.6 (0.3)	288	2.0 (0.1)	864
<b>Primary mining activity (%)</b>						
Digging for ore without machines	69.9% (6.9)	397	13.9% (10.7)	17	54.6% (8.6)	414
Moving materials within the mine site or outside the mine	6.4% (2.7)	31	11.5% (3.0)	40	7.8% (2.1)	71
Cleaning or preparing tools or workspaces	x		23.5% (6.8)	46	6.8% (3.2)	50
Digging for ore using machines	x		14.9% (3.9)	37	5.2% (1.9)	46
Washing materials	5.5% (1.2)	27	x		5.0% (1.0)	31
Buying or selling ore or other excavated materials	6.5% (2.4)	47	x		4.8% (1.5)	48
Crushing rocks	6.1% (2.8)	34	x		4.6% (2.2)	39
Supervising mine workers	x		12.1% (2.7)	27	3.8% (1.7)	36

<sup>68</sup> The difference is statistically significant (p<.0001).

	ASM		LSM		Total	Total
	% (SE)	n	% (SE)	n	% (SE)	n
Administrative work related to the mine	-	0	11.1% (2.9)	41	3.0% (1.3)	41
Guarding a mine or mined materials	-	0	6.9% (2.1)	29	1.9% (0.7)	29
Other	2.8% (1.7)	14	1.4% (1.0)	10	2.4% (1.2)	24
<b>Number of respondents (N)</b>						864 <sup>1</sup>

<sup>1</sup> N is smaller for item with missing data: Primary mining activity N=829

As discussed previously, only 3 percent of workers are female (see *Section 4. Study Limitations* for limitations to this estimate). Within the population represented by the sample, female and male workers have similar average ages (34 for women and 32 for men). On average, male workers have slightly more education than female workers, with 87 percent of men and 77 percent of women having completed primary or higher. In terms of work characteristics, a little over half of women (56 percent) are self-employed, and 44 percent work for an employer. A higher proportion of women work for an employer compared to men (27 percent). Three-fourths of women (74 percent) work at ASM sites and 26 percent at LSM sites, and this ratio is similar for men. The most common primary work activity for women is selling food or drink to mine workers (33 percent). Due to the small number of women in the sample, this report contains very few estimates disaggregated by gender in the findings presented in the following sections.

## 5.2. Forced labor indicators and prevalence

As described in *Section 2.2.2. Operationalizing the definition of forced labor*, workers were considered to have experienced forced labor if they had both an indicator of involuntariness and an indicator of menace of penalty. This section starts by presenting findings related to the overall prevalence and nature of forced labor among cobalt workers who work for an employer. It then describes circumstances of involuntary work and coercion among cobalt workers who work for an employer; these indicators alone do not constitute forced labor per se.<sup>69</sup> Because there were relatively few workers who work for an employer at ASM sites (n=48), it is not possible to disaggregate forced labor indicators by type of mine site.

### 5.2.1. Prevalence of forced labor

**The study found that more than three-fourths (78 percent) of employed cobalt workers experience forced labor.**<sup>70</sup> Figure 1 presents the most common combinations of coercion and involuntariness indicators reported by employed workers who experience forced labor. These indicators of involuntariness and menace of penalty are discussed in *Section 5.2.2* in more detail. Nearly half (48.3%) of workers experiencing forced labor report both an inability to refuse hazardous work and restrictions on their movement. A similar proportion (46.2%) report an inability to refuse hazardous work and some type of abuse of vulnerability. The other most common combinations of coercion and involuntariness are:

- Abusive overtime accompanied by restrictions on worker movements (38.3% of those experiencing forced labor)
- Abusive overtime accompanied by abuse of vulnerability (38.1% of those experiencing forced labor)

<sup>69</sup> Indicators of involuntariness described and indicators of menace of penalty described in *Section 5.2.2*, by themselves, do not constitute forced labor.

<sup>70</sup> This study identified 251 cases of forced labor.

- Lower earnings than expected accompanied by restrictions on worker movements (35.8% of those experiencing forced labor)
- Work of a different nature than described accompanied by restrictions on worker movements (27.7% of those experiencing forced labor)
- Work of a different nature than described accompanied by abuse of vulnerability (22.7% of those experiencing forced labor)
- Inability to refuse hazardous work accompanied by withholding of wages or other promised benefits (22.1% of those experiencing forced labor)

All other combinations occurred among fewer than one in five workers experiencing forced labor.

**Figure I. Heatmap of coercion and involuntariness indicators among employed workers who experienced forced labor (weighted)**

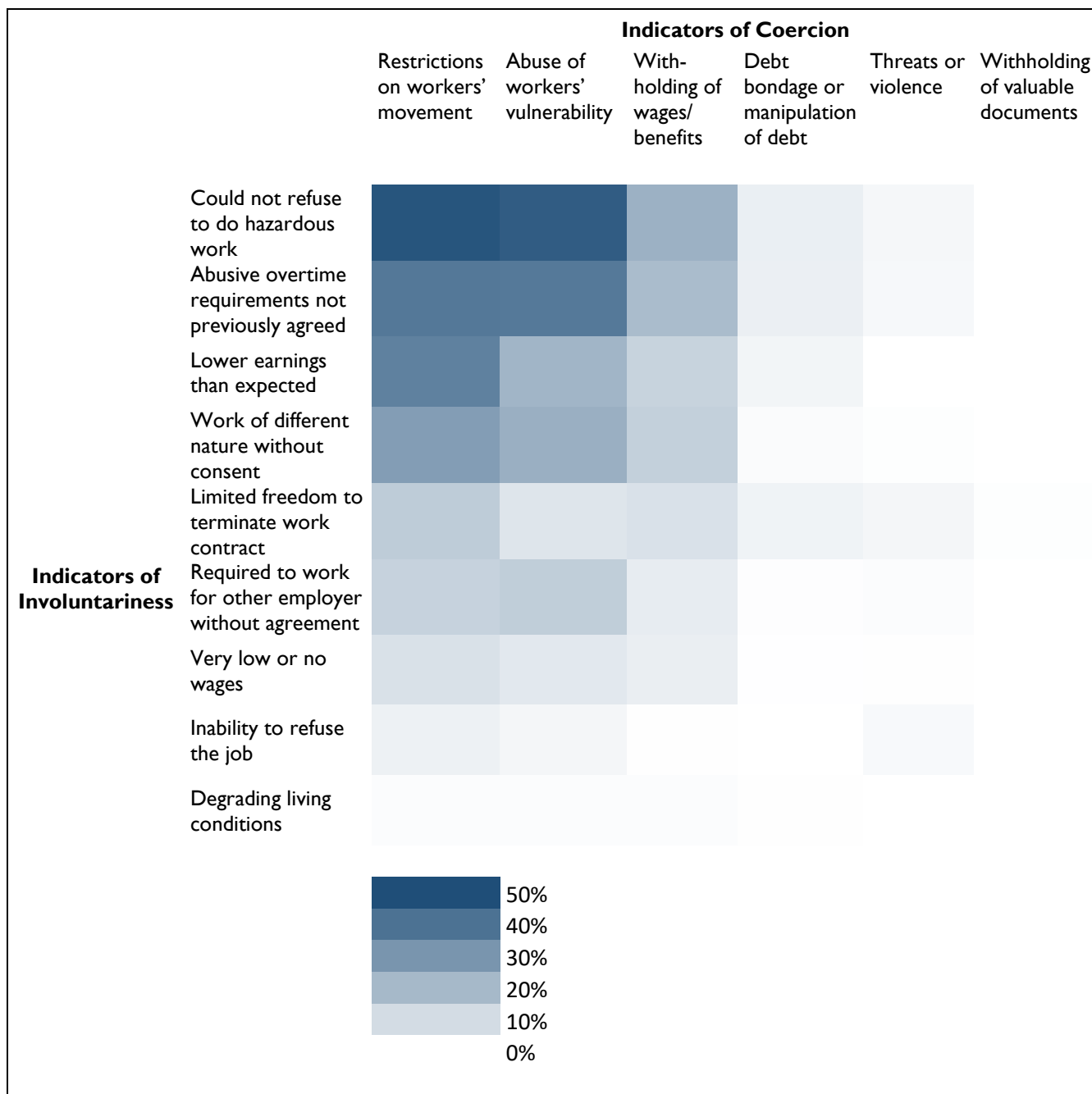


Table 6 presents the prevalence of forced labor by various demographic and work characteristics. The rates of forced labor are similar for males (78 percent) and females (80 percent). A significantly higher proportion of those who earn below minimum wage experience forced labor (98 percent), compared to those who earn above minimum wage (76 percent). Those whose employers impose a production quota experience significantly higher rates of forced labor (93 percent), compared to those without production quotas (75 percent). Workers in Haut-Katanga have a significantly higher rate of forced labor (83 percent), compared to workers in Lualaba (68 percent). Those who belong to a cooperative have a significantly higher rate of forced labor (92 percent) compared to those who do not (76 percent).

The rate of forced labor is slightly lower for workers at LSM sites (77 percent), compared to those at ASM sites (84 percent), but this difference is not statistically significant. The rate of forced labor is slightly lower for workers who were born in their province of work (75 percent), compared to those who were born outside their province of work (82 percent), but this difference is not statistically significant. Following the same pattern as age, the rate of forced labor decreases with increased time in the job, except for the longest-working category of workers, who experience high rates of forced labor similar to new workers. Those who have contracts and do not have contracts have similar rates of forced labor (76 percent, compared to 80 percent).

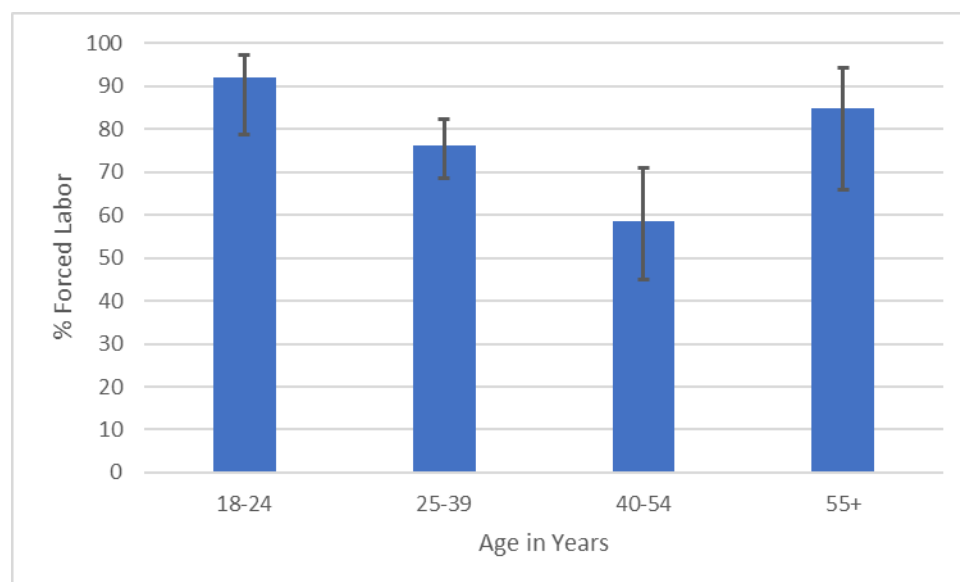
**Table 6. Prevalence of forced labor among employed workers by demographic characteristics (weighted)**

	<b>% (SE)</b>	<b>n</b>
<b>Total</b>	77.9% (3.1)	251
<b>Age (years)</b>		
18–24	92.1% (3.9)	43
25–39	76.1% (3.2)	104
40–54	58.6% (6.2)	38
55+	84.8% (6.4)	66
<b>Gender</b>		
Male	77.8% (3.2)	241
Female	79.8% (6.8)	10
<b>Pay</b>		
Earns above minimum wage	76.3% (3.6)	218
Earns below minimum wage	97.6% (2.0)	33
<b>Production quota</b>		
Yes	92.8% (3.0)	47
No	75.1% (3.5)	204
<b>Province of work</b>		
Haut-Katanga	82.6% (2.5)	179
Lualaba	67.7% (3.8)	72
<b>Type of mine site</b>		
ASM	83.6% (5.2)	34
LSM	76.9% (3.9)	216
<b>In a cooperative</b>		
Yes	92.2% (4.1)	27
No	76.4% (3.7)	224
<b>Migrant status</b>		
Born outside province of current work	81.5% (5.0)	114
Not born outside province of current work	75.2% (3.8)	137
<b>Length of time in job</b>		
≤2 years	81.9% (2.6)	121
3–4 years	78.2% (12.1)	29
5–9 years	65.8% (8.9)	24
10–19 years	36.2% (11.2)	8
20+ years	82.4% (4.2)	69
<b>Whether has contract</b>		
Has contract	76.4% (4.7)	181
Does not have contract	79.6% (3.1)	70
<b>Number of respondents (N)</b>		340 <sup>1</sup>

<sup>1</sup> N is smaller for one item with missing data: Type of mine site N=339

The rate of forced labor decreases with increased age except for the oldest category of workers, who experience high rates of forced labor similar to the youngest workers (Figure 2).

**Figure 2. Prevalence of forced labor among employed workers by age (weighted)**



The study identified the presence of forced labor among workers in villages close to certain Chinese-associated cobalt mines and facilities. Specifically, 98 respondents experienced forced labor and lived within 15km of a Chinese-associated mine. A majority of employed cobalt miners who lived in close proximity (within 5km and 1 hour walking) to Chinese-associated cobalt mining sites and facilities experienced forced labor (62 percent, 65 out of 105 respondents).

There were workers in several villages that reported notably high incidence of forced labor, and these villages are located in close proximity (within 5km and 1 hour walking) to Chinese-associated mine sites and facilities. These included:

- Kasulo Mine: 44 out of 73 respondents in nearby villages experienced forced labor (60%)
- Ruashi Mine: 16 out of 25 respondents in nearby villages experienced forced labor (64%)

With smaller samples of workers, high forced labor rates were also identified for workers near Kisanfu mine and Tenke Fungurume mine.

### **5.2.2. Indicators of involuntariness and coercion**

As shown in Table 7, a large proportion of employed workers experience indicators of involuntariness (80 percent). Situations of involuntariness, when discussed separately from coercion, do not necessarily constitute forced labor.<sup>71</sup> Close to half (44 percent) of employed workers cannot refuse to do hazardous work. For example, some workers are exposed to improperly reinforced tunnels that could collapse. Others risk lung and skin damage due to exposure to chemicals without protective equipment. More than one-third (36 percent) are subjected to abusive overtime requirements to which they have not previously agreed. For example, one respondent is routinely required to work from 7am to 7pm by an employer who retains one of the respondent's important documents (such as his passport or school certificate). Many employed workers experience deceptive recruitment—one-fourth (25 percent) are required to work job of a different nature than described before hiring without their consent, and 28 percent receive lower earnings than expected compared to the earnings described before hiring. Less

<sup>71</sup> Accordingly, Table 7 may include workers who are not in a situation of forced labor.

common indicators of involuntariness include limited freedom to terminate the work contract (13 percent) and being required to work for another employer without agreement (12 percent).

**Table 7. Respondents experiencing indicators of involuntariness among employed miners (weighted)**

	% (SE)	n
Could not refuse to do hazardous work	43.9% (4.6)	133
Abusive overtime requirements not previously agreed	35.6% (3.8)	114
Lower earnings than expected	28.1% (8.0)	52
Work of different nature without consent	24.8% (4.2)	74
Limited freedom to terminate work contract	12.5% (3.2)	71
Required to work for other employer without agreement	11.8% (2.6)	47
Very low or no wages (defined as below minimum wage)	7.6% (3.2)	35
Inability to refuse the job	3.2% (1.3) <sup>1</sup>	5
Degrading living conditions	1.0% (1.0)	14
<b>Experienced at least one indicator of involuntariness</b>	<b>80.4% (3.2)</b>	<b>265</b>
<b>Number of respondents (N)</b>		<b>340</b>

<sup>1</sup> Fewer than 10 observations were used to calculate this estimate. Estimate should be interpreted with caution.

Nearly all employed workers experience indicators of coercion (Table 8). Situations of coercion, when discussed separately from involuntariness, do not necessarily constitute forced labor.<sup>72</sup> A large proportion (85 percent) are prevented from leaving their worksites during the workday by guards or fences. According to local researchers, guards are often armed with whips. They are there to protect the mine site and equipment but also to compel workers to stay for their full shifts and ensure they do not take anything from the employer. Nearly two-thirds of workers (60 percent) experience abuse of their vulnerability through denial of rights or privileges or threats of dismissal. This abuse primarily takes the form of dismissal or threats of dismissal and fines or deductions from wages. Withholding of wages or other promised benefits is also a common form of coercion (28 percent).

**Table 8. Respondents experiencing indicators of coercion among employed miners (weighted)**

	% (SE)	n
Restrictions on workers' movement	85.2% (3.9)	273
Abuse of workers' vulnerability through the denial of rights or privileges, threats of dismissal or deportation (includes exclusion from future employment, financial penalties) <sup>1</sup>	59.7% (4.6)	187
<i>Dismissal or threats of dismissal</i>	55.5% (4.8)	161
<i>Fine or deduction from wages</i>	15.7% (5.5)	45
<i>Other abuses of vulnerability</i>	3.7% (1.0)	21
Withholding of wages or other promised benefits	28.2% (2.3)	99
Debt bondage or manipulation of debt	9.3% (2.1)	33
Threats or violence against workers or workers' families and relatives, or close associates	3.8% (1.6)	17
Withholding of valuable documents (such as identity documents or residence permits)	0.5% (0.3) <sup>2</sup>	8
<b>Experienced at least one indicator of menace of penalty</b>	<b>94.7% (1.4)</b>	<b>310</b>
<b>Number of respondents (N)</b>		<b>340</b>

<sup>1</sup> Some workers experienced multiple types of abuse of vulnerability.

<sup>2</sup> Fewer than 10 observations were used to calculate this estimate. Estimate should be interpreted with caution.

The structure of the questionnaire allows us to explore the work activity or requirement about which workers experience coercion (Table 9). Nearly half of employed workers (47 percent) experience

<sup>72</sup> Accordingly, Table 8 may include workers who are not in a situation of forced labor.



coercion related to overtime, and 40 percent experience coercion related to the requirement to do hazardous work. Other common activities or requirements about which employed workers experience coercion include quotas (14 percent), debt (13 percent), and being required to do work of a different nature without consent (13 percent).

**Table 9. Work activity or requirement about which respondent experienced coercion among employed miners (weighted)**

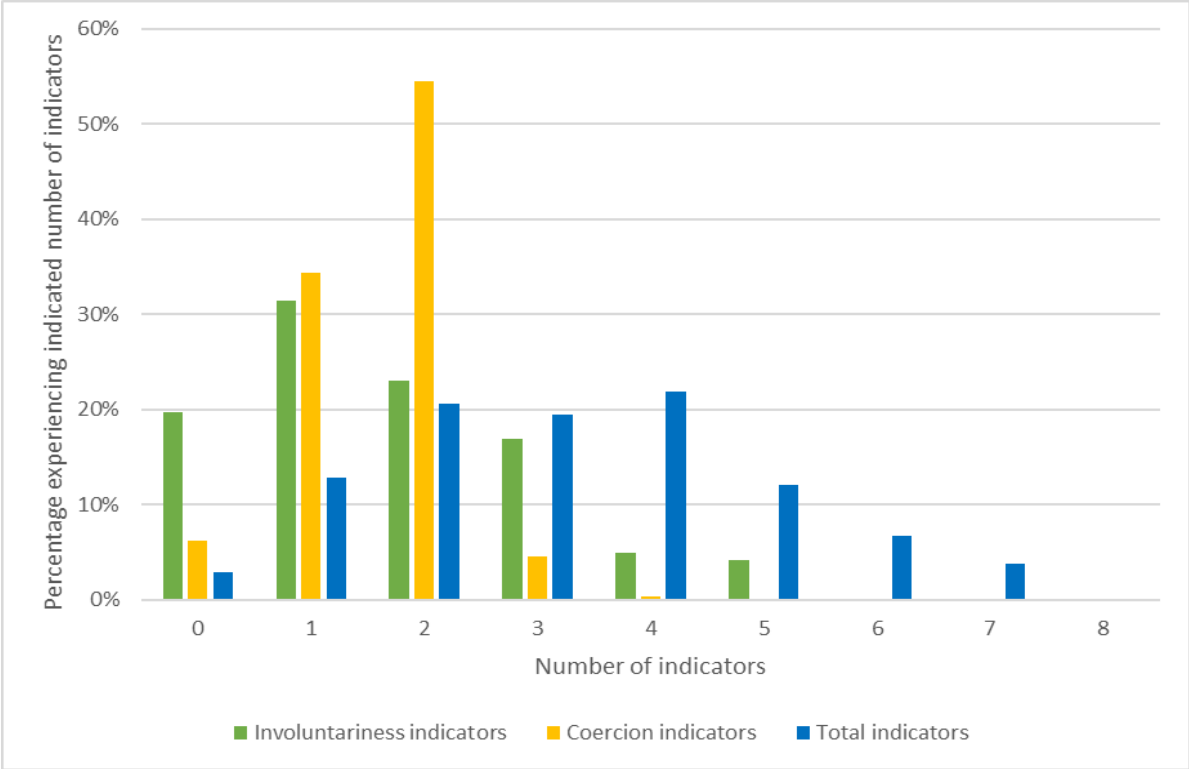
	% (SE)	n
Coercion related to overtime	46.8% (4.9)	146
Coercion related to hazardous work	39.7% (4.4)	106
Coercion related to quotas	14.2% (2.6)	40
Coercion related to debt	13.4% (3.4)	35
Coercion related to work of a different nature without consent	12.7% (3.1)	37
Coercion related to being required to work for another employer	10.6% (2.3)	38
Coercion related to inability to quit	6.2% (2.3)	34
Coercion related to not being able to refuse to work for employer	3.3% (1.3) <sup>1</sup>	6
<b>Number of respondents (N)</b>		<b>340</b>

<sup>1</sup> Fewer than 10 observations were used to calculate this estimate. Estimate should be interpreted with caution.

Indicators of involuntariness (Table 7) and indicators of menace of penalty (Table 8) reported by respondents are not, by themselves, situations of forced labor. Establishing forced labor requires both involuntariness and menace of penalty. However, the conditions of involuntariness and menace of penalty in the data indicate widespread vulnerability to forced labor among employed cobalt workers.

Figure 3 presents the percentage of employed workers who experience each number of indicators. On average, employed workers experience 1.7 indicators of involuntariness (95 percent confidence interval [CI]: 1.4–2.0), 1.6 indicators of coercion (95 percent CI: 1.4–1.7), and 3.3 total indicators of either involuntariness or coercion (95 percent CI: 2.8–3.7). The research found that 23 percent of employed workers experience 5 or more indicators of either involuntariness or coercion, and all of these workers experienced forced labor (in other words, they experienced at least one indicator of coercion and one indicator of involuntariness among the 5 or more indicators).

**Figure 33. Number of involuntariness and coercion indicators experienced by employed workers**



We explored correlations between the primary indicators of involuntariness and indicators of menace of penalty, and several key demographic characteristics, including age, education, and province of work (Table D-1 in *Appendix D*). The research team found no significant (defined as  $p < 0.05$ ) correlation between education and the indicators. Some indicators were significantly correlated with age. Respondents in the youngest age category tended to experience higher levels of work of a different nature than described, involuntary overtime, and involuntary hazardous work. The oldest workers experienced higher levels of inability to quit without negative consequences by the employer. Workers in Haut-Katanga experienced higher levels of withholding wages and abuse of workers’ vulnerability through the denial of rights or privileges, threats of dismissal or deportation. All of these comparisons must be interpreted with caution due to the small sample size.

**5.2.3. Number of workers in forced labor**

As described previously, 78 percent of *employed workers* experience forced labor. It is difficult to estimate how many workers experience forced labor because there are no reliable estimates of the total number of cobalt mine workers in the DRC. Using limited available data, the research approximates that between 67,000<sup>73</sup> and 80,000<sup>74</sup> employed adult cobalt miners experience conditions of forced labor. The estimated total number of cobalt mine workers, include both employed and self-employed workers, is 305,255 to 350,000.

<sup>73</sup> The estimated total number of cobalt miners computed using the 2013–2014 Demographic and Health Survey for the DRC average household size, the total number of people living in mining communes from the sampling frame, the sampling weights for this study, and the average number of adult mine workers in mining households in this study is 305,255.

<sup>74</sup> Based on discussions with *Service d’assistance et d’encadrement des mines artisanales et de petit echelle* (SAEMAPE), a DRC government service to coordinate artisanal miners, and Trafigura, a financing structure for artisanal miners via traders, the local research team estimates that more than 350,000 work in the cobalt mining sector.

#### 5.2.4. Roles in cobalt mining associated with increased vulnerability to forced labor

Table 10 shows the prevalence of forced labor by primary mining activity for the five most common mining activities among employed workers. Workers who dig for ore using machines have the highest rate of forced labor (86 percent), followed by those who clean or prepare tools or worksites (78 percent) and those who supervise mine workers (72 percent). On average, those who move materials within the mine site (68 percent) and those who do administrative work related to the mine (59 percent) have lower rates of forced labor. However, these comparisons must be interpreted with caution due to the small sample size and large standard errors.

The most common forced labor indicator for workers in all five of the primary mining activities is restriction on worker movements (Table D-2 in *Appendix D*). Abuse of workers' vulnerability is the second most common indicator for all five activities (tied with involuntary hazardous work for those who dig for ore using machines). The third most common indicator for those who clean or prepare tools or worksites and those who move materials is involuntary hazardous work. The third most common indicator for those who do administrative or supervisory work is abusive overtime. These comparisons must be interpreted with caution due to the small sample size and large standard errors.

**Table 10. Prevalence of forced labor by mining role among employed workers (weighted)**

	% (SE)	n	N
Digging for ore using machines	86.0% (4.0)	33	40
Cleaning or preparing tools or worksite	78.0% (8.0)	36	48
Supervising mine workers	71.8% (9.0)	20	31
Moving materials within the mine site or outside the mine	68.2% (9.1)	30	43
Administrative work related to the mine	59.2% (8.2)	26	41

We developed multivariate logistic regression models for forced labor that allowed us to identify the predictors with a significant impact when adjusted for the other predictors. The effect is quantified by the odds ratio (OR), which is significant ( $p$ -value  $<0.05$ ) for a few predictors, most notably for the pay, production quota, and province of work variables (Table 11). Workers earning below minimum wage are at much higher risk of forced labor (predictors do not imply causality or direction). Workers earning below minimum wage have 6.6 times the odds of being in forced labor compared to workers earning above minimum wage. Workers with a production quota are at significantly higher risk of forced labor than workers without a production quota. Workers with a production quota have 3.9 times the odds of being in forced labor compared to workers without a production quota. Workers in Haut-Katanga are at significantly higher risk than workers in the Lualaba. Workers in Haut-Katanga have 2.7 times the odds of being in forced labor compared to workers in Lualaba. Other notable, yet non-significant, differences (higher risk) are found for younger workers and male workers, as well as for workers at LSM sites (as compared to those at ASM sites).

**Table 11. Odds ratios and 95 percent confidence intervals for predictors of forced labor**

Predictor	Forced labor OR (95% CI)	P-value
<b>Age</b>		
18–24	REF	
25–39	0.523 (0.23–1.22)	0.132
40–54	0.228 (0.09–0.56)	0.001
55+	0.945 (0.36–2.47)	0.907
<b>Gender</b>		
Male	REF	
Female	0.574 (0.20–1.63)	0.296
<b>Pay</b>		
Earns above minimum wage	REF	
Earns below minimum wage	6.584 (1.55–28.03)	0.011
<b>Production quota</b>		
Yes	3.871 (1.49–10.07)	0.006
No	REF	
<b>Province of work</b>		
Haut-Katanga	2.660 (1.62–4.38)	0.0001
Lualaba	REF	
<b>Type of mine site</b>		
ASM	REF	
LSM	1.186 (0.60–2.33)	0.621
<b>Educational attainment</b>		
No formal schooling or some preschool or primary	0.611 (0.26–1.44)	0.259
Completed primary	1.374 (0.29–6.61)	0.692
Completed secondary or higher	REF	
<b>Primary mining activity</b>		
Digging ore without machines	0.642 (0.19–2.15)	0.473
Moving materials within the mine site or outside the mine	1.059 (0.50–2.25)	0.882
Cleaning or preparing tools or worksite	1.376 (0.65–2.93)	0.407
Buying or selling ore or other excavated materials	0.459 (0.03–7.53)	0.585
Digging for ore using machines	2.163 (0.88–5.32)	0.093
All others	REF	

### 5.3. Working conditions and hazards

This section discusses working conditions and exposure to hazards. Where possible, the results are disaggregated by type of mine site and by forced labor status.

#### 5.3.1. Recruitment and contracts

This section explores recruitment conditions and the prevalence of employment contracts among employed workers. As discussed in *Section 5.2.1. Forced labor indicators*, many employed workers experience deceptive recruitment, including being required to perform work of a different nature than described before hiring without their consent (25 percent) and receiving lower earnings than expected compared to the earnings described before hiring (28 percent). Only 54 percent of employed workers

have a contract (Table 12).<sup>75</sup> Contracts may be written or verbal. Among those who have a contract, 29 percent have a daily contract. A daily contract is one in which the workers make a daily agreement. These workers are paid daily, and their pay depends on the tasks performed that day. An additional 28 percent have a time-bound contract. This type of contract indicates that there is an agreed upon end date, and after this period, the contract may be terminated or renewed. In this context, a second renewal generally results in a permanent contract. Finally, among those with a contract, nearly half (43 percent) have a permanent contract. A permanent contract has no end date and cannot be terminated without serious fault.

Most workers report being able to refuse to work for the employer (fewer than 10 respondents are unable to refuse). However, it is worth noting that some mining workers may work in crews, and the study did not assess whether the crew is able to refuse to work for an employer. It is also uncommon for workers to pay recruitment fees (6 percent).

**Table 12. Recruitment fees and contracts by type of mine site and by forced labor status among employed workers (weighted)**

	Type of mine site		Forced labor status		Total % (SE)	Total N
	ASM % (SE)	LSM % (SE)	Forced labor % (SE)	Not forced labor % (SE)		
<b>Paid recruitment fees</b>	12.0% (5.6) <sup>1</sup>	5.3% (1.2)	7.2% (1.6)	2.8% (1.9) <sup>1</sup>	6.2% (1.2)	340
<b>Had contract</b>	57.3% (12.0)	53.8% (15.0)	53.4% (12.1)	57.9% (18.3)	54.4% (13.4)	340
<b>Type of contract</b>						243
Daily contract	26.8% (5.8) <sup>1</sup>	29.7% (12.2)	32.5% (10.3)	18.3% (12.7) <sup>1</sup>	29.2% (10.2)	
Time-bound/fixed term contract	64.3% (9.1)	21.6% (5.7)	31.6% (6.1)	15.7% (6.8) <sup>1</sup>	27.9% (5.0)	
Permanent contract	8.9% (8.9) <sup>1</sup>	48.7% (11.7)	35.8% (11.5)	66.1% (13.1)	43.0% (11.7)	

<sup>1</sup> Fewer than 10 observations were used to calculate this estimate. Estimate should be interpreted with caution.

<sup>75</sup> Not having a contract is significantly associated with receiving lower earnings than expected. Twenty percent of those who had a contract had lower earnings than expected compared to 37 percent of those without a contract. Being required to work job of a different nature than described before hiring without their consent is not significantly associated with whether or not the worker has a contract.

### 5.3.2. Worker safety and health

Most workers report exposure to multiple hazards. The most common hazards are dust or strong fumes without appropriate protective equipment (84 percent), using dangerous or sharp tools or heavy machinery without appropriate protective equipment (77 percent), and carrying unreasonably heavy loads (77 percent) (Table 13). In addition, more than half of workers experience each of the following: extreme heat without sufficient breaks or without access to clean water (70 percent), dangerous chemicals without appropriate protective equipment (62 percent), excessive noise without appropriate protective equipment (60 percent), and insecure tunnels (59 percent). With the exception of exposure to excessive noise and dangerous chemicals, more workers at ASM sites report exposure to each of these kinds of hazards than those at LSM sites. Without exception, the proportion of workers who experience forced labor who report exposure to each hazard is higher than that of the workers who do not experience forced labor.

One-third of respondents (33 percent) mentioned other hazards, including attack by military, other miners, or security guards (with tear gas, bullets, or dogs); landslides; lack of oxygen; defective equipment; electrocution; drowning; and traffic accidents.

Across all respondents, the average number of hazards reported is 5.4. The number is higher for workers at ASM sites (5.6 hazards), compared to workers at LSM sites (4.7 hazards).<sup>76</sup> On average, employed workers who experience forced labor are exposed to more hazards (5.0), compared to employed workers who do not experience forced labor (4.0).<sup>77</sup>

Workers offered the following comments regarding other hazards:

- *The way the bags are stored, I have to climb above to see the digger well with the risk of falling into the basin at any time.*
- *Whips by cooperatives due to non-membership*
- *Derailment of the train loaded with minerals*
- *Snake[s], dogs, fill up [of tunnel with water], being shot by the security services*
- *Dog bites, falling rocks, military bullets*
- *The rocks which sometimes fall to the workers during the work*
- *The irons of the heavy weights that we lift that can fall on someone. And they die.*
- *The bad dogs, pursuit of soldiers who guard the concession*
- *Shot by the military and security elements which causes a lot of death*

**Table 13. Exposure to hazards<sup>1</sup> by type of mine site and by forced labor status (weighted)**

	Type of mine site		Forced labor status		Total % (SE)
	ASM % (SE)	LSM % (SE)	Forced labor % (SE)	Not forced labor % (SE)	
Dust or strong fumes without appropriate protective equipment	90.6% (2.6)	67.6% (5.9)	76.1% (4.4)	50.0% (15.3)	84.0% (3.7)
Dangerous or sharp tools or heavy machinery without appropriate protective equipment	86.2% (3.9)	54.0% (9.9)	66.2% (6.9)	42.5% (10.1)	77.0% (5.6)
Carrying unreasonably heavy loads	88.3% (4.0)	47.1% (10.1)	54.3% (9.5)	23.7% (9.5)	76.6% (6.7)
Extreme heat without sufficient breaks or without access to clean water	74.1% (3.6)	58.0% (9.6)	67.1% (8.6)	28.4% (8.0)	69.5% (3.6)
Dangerous chemicals without appropriate protective equipment	60.2% (5.4)	65.4% (10.2)	71.1% (9.3)	43.7% (13.5)	61.7% (4.9)

<sup>76</sup> The difference is statistically significant (p=<.0001).

<sup>77</sup> The difference is statistically significant (p=.003).

	Type of mine site		Forced labor status		Total % (SE)
	ASM % (SE)	LSM % (SE)	Forced labor % (SE)	Not forced labor % (SE)	
Excessive noise without appropriate protective equipment	56.9% (4.0)	66.9% (10.9)	77.7% (9.4)	41.8% (10.2)	59.7% (4.6)
Insecure tunnels	67.3% (5.8)	36.5% (10.1)	36.2% (13.1)	14.1% (6.9)	58.5% (6.2)
Other dangerous work	32.8% (5.5)	12.9% (5.5)	14.5% (6.2)	5.5% (2.3)	27.2% (5.5)
<b>Number of respondents (N)</b>	626	319	251	89	946

<sup>1</sup> Multiple responses possible

Less than half of workers (43 percent) report usually wearing some type of protective gear (Table 14). The proportion is much lower for workers at ASM sites (29 percent), compared to those at LSM sites (79 percent). The proportion of workers who wear protective gear is similar for those who experience forced labor (79 percent) and those who do not (86 percent). Among workers who usually wear protective gear, the most common types of protective gear are shoes (82 percent), helmets (61 percent), gloves (60 percent), and protective clothing (58 percent). More than one-third of workers (40 percent) wear a respirator or dust mask, and 30 percent wear protective goggles. Workers were asked whether there is protective equipment they do not have that would make them feel safer. Two-thirds of workers (66 percent) answered in the affirmative. The demand for protective gear was much higher for workers at ASM sites (71 percent) than it was for workers at LSM sites (52 percent), reflecting the lower proportion of workers at ASM sites who usually wear (and, presumably, have access to) protective gear.

**Table 14. Protective gear by type of mine site and by forced labor status (weighted)**

	Type of mine site		Forced labor status		Total % (SE)	Total N
	ASM % (SE)	LSM % (SE)	Forced labor % (SE)	Not forced labor % (SE)		
<b>Usually wears protective gear</b>	28.8% (3.2)	78.7% (5.2)	79.0% (1.9)	85.9% (3.9)	42.9% (4.6)	946
<b>Type of protective gear<sup>1</sup></b>						441
Shoes	77.2% (8.2)	86.2% (3.2)	85.2% (3.2)	88.8% (4.7)	81.9% (4.0)	
Helmet	32.8% (5.4)	87.7% (4.9)	88.5% (4.1)	89.1% (5.2)	61.3% (7.5)	
Gloves	46.2% (8.4)	73.5% (3.5)	69.0% (3.2)	86.4% (5.2)	60.4% (5.5)	
Protective clothing	37.0% (12.7)	76.3% (3.0)	76.7% (3.7)	80.8% (6.5)	57.5% (9.5)	
Respirator or dust mask	22.4% (6.9)	55.5% (8.6)	54.5% (8.2)	69.4% (12.0)	39.6% (6.7)	
Protective goggles	4.9% (2.3)	53.3% (6.4)	53.6% (4.9)	58.1% (13.5)	30.1% (7.0)	
Earplugs	0.0% (0.0)	21.2% (7.6)	14.8% (4.6)	41.3% (15.0)	11.0% (4.0)	
Face shield	0.7% (0.6) <sup>2</sup>	9.7% (4.7)	7.2% (4.3)	19.6% (8.1)	5.4% (2.4)	
Other	1.9% (1.6) <sup>2</sup>	2.2% (1.3)	1.4% (0.8) <sup>2</sup>	4.8% (2.9) <sup>2</sup>	2.1% (1.1)	
<b>Is there protective equipment that you don't have that would make you feel safer?</b>						939
Yes	71.0% (5.1)	51.5% (7.4)	57.0% (5.8)	34.4% (8.5)	65.5% (4.0)	
No	29.0% (5.1)	48.5% (7.4)	43.0% (5.8)	65.6% (8.5)	34.5% (4.0)	

<sup>1</sup> Multiple responses possible

<sup>2</sup> Fewer than 10 observations were used to calculate this estimate. Estimate should be interpreted with caution.

Unsurprisingly, given the high rates of exposure to hazards, nearly two-thirds of all workers (63 percent) have gotten hurt or sick because of their work in their most recent job in cobalt mining (Table 15). The rate of injury or illness is nearly twice as high for workers at ASM sites (72 percent) as it is for workers at LSM sites (39 percent). Workers who experience forced labor have more than twice the rate of injury or illness (45 percent), compared to workers who do not experience forced labor (21 percent). Among those who have been hurt or injured, the most common types of ailments are injuries to feet (43 percent), injuries to knees or legs (42 percent), and injuries to or swelling in hands (41 percent).

The most common ways the injuries or illnesses occur are falling rocks and tool accidents (both 57 percent of those who have gotten sick or hurt). More than 80 percent of those who have ever gotten sick or hurt received medical care for their most recent injury or illness. Among all who received medical care, 79 percent paid for the care themselves, and for 8 percent, the care was paid for by the employer. A higher proportion of workers at ASM sites paid for their own care (85 percent, compared to 54 percent of workers at LSM sites), and employer-paid care occurred almost exclusively for workers at LSM sites (39 percent). The rate of employer-paid care was higher for workers in forced labor (49 percent of those who received care), compared to workers not in forced labor (36 percent). Most workers who received medical care for their most recent illness or injury reported that the medical care received was enough to resolve the problem (89 percent; not shown in table).

**Table 15. Illnesses or injuries due to job by type of mine site and by forced labor status (weighted)**

	Type of mine site		Forced labor status		Total % (SE)	Total N
	ASM % (SE)	LSM % (SE)	Forced labor % (SE)	Not forced labor % (SE)		
<b>Ever gotten hurt or sick because of work in this job</b>	71.9% (4.9)	38.7% (4.7)	45.3% (3.7)	21.1% (4.0)	62.4% (5.5)	946
<b>Type of injury or sickness<sup>1</sup></b>						569
Injury to feet	48.0% (10.8)	17.3% (8.2)	19.8% (9.2)	5.1% (3.9) <sup>2</sup>	42.5% (10.9)	
Injury to knees or legs	45.1% (3.1)	26.1% (4.3)	33.4% (6.6)	20.4% (13.4)	41.7% (3.3)	
Injury to or swelling in hands	43.7% (5.3)	29.5% (5.5)	32.2% (6.0)	17.7% (8.6) <sup>2</sup>	41.2% (4.6)	
Back strain/pain in back	18.9% (4.0)	22.3% (4.0)	17.3% (3.3)	15.7% (6.8) <sup>2</sup>	19.5% (3.4)	
Smoke, dust, or chemical damage to lungs	11.3% (4.2)	14.3% (4.1)	17.7% (4.1)	1.0% (1.1) <sup>2</sup>	11.8% (3.9)	
Other	3.3% (1.8)	6.4% (2.9)	5.9% (2.9)	7.4% (3.8) <sup>2</sup>	4.0% (1.8)	
<b>How got hurt or sick<sup>1</sup></b>						569
Falling rock	65.2% (4.2)	20.2% (9.1)	23.9% (11.1)	22.2% (10.7) <sup>2</sup>	57.3% (6.7)	
Tool accident	56.8% (6.2)	57.7% (9.4)	61.0% (9.2)	68.4% (13.3)	56.9% (6.2)	
Insufficient ventilation	8.3% (3.8)	15.2% (4.8)	18.5% (4.8)	2.0% (2.1) <sup>2</sup>	9.5% (3.7)	
Machinery accident	0.3% (0.2) <sup>2</sup>	15.2% (3.5)	15.8% (2.5)	14.2% (6.6) <sup>2</sup>	2.9% (1.1)	
Other	9.6% (5.8)	8.4% (3.6)	7.1% (3.6)	6.2% (4.8) <sup>2</sup>	9.4% (5.0)	
<b>Received medical care for most recent injury or illness</b>	83.6% (2.4)	82.4% (3.2)	79.3% (6.2)	79.0% (18.8)	83.4% (2.0)	569
<b>Payer of medical care for most recent injury or illness<sup>1</sup></b>						491
Self	84.8% (4.0)	54.1% (7.6)	51.9% (8.5)	70.0% (9.2)	79.4% (4.3)	



	Type of mine site		Forced labor status		Total % (SE)	Total N
	ASM % (SE)	LSM % (SE)	Forced labor % (SE)	Not forced labor % (SE)		
Friends, family, colleagues, or cooperative	24.1% (3.9)	7.9% (5.5) <sup>2</sup>	3.8% (2.1) <sup>2</sup>	2.8% (2.0) <sup>2</sup>	21.3% (3.1)	
Employer	1.5% (0.9) <sup>2</sup>	39.1% (10.3)	49.2% (8.7)	36.1% (8.9)	8.1% (2.7)	

<sup>1</sup> Multiple responses possible

<sup>2</sup> Fewer than 10 observations were used to calculate this estimate. Estimate should be interpreted with caution.

### 5.3.3. Working hours and days

On average, cobalt workers work 9.5 hours per day, 5 days per week, and they average 51 hours per week (Table 16). Workers at LSM sites work more hours per week (59) than those at ASM sites (49). Workers who experience forced labor work a similar number of hours (62), compared to those who do not experience forced labor (60).

**Table 16. Working hours and days by type of mine site and by forced labor status (weighted)**

	Type of mine site		Forced labor status		Total (SE)
	ASM (SE)	LSM (SE)	Forced labor (SE)	Not forced labor (SE)	
Average hours per day	9.3 (0.4)	10.2 (0.2)	10.3 (0.3)	10.3 (0.3)	9.5 (0.3)
Average days per week	5.1 (0.2)	5.8 (0.2)	6.0 (0.1)	5.8 (0.2)	5.3 (0.2)
Average hours per week	48.7 (3.1)	59.2 (2.1)	61.7 (1.9)	59.7 (2.0)	51.6 (2.5)
<b>Number of respondents (N)</b>	626	319	251	89	946

### 5.3.4. Earnings and mineral sales

Nearly all workers are paid in the form of money (94.5 percent). Self-employed miners likely receive cash payment by selling their mined minerals to traders or buying houses. The remainder are paid in both money and minerals (4.7 percent) or just minerals (0.8 percent).

Overall, mine workers earn an average of \$8 per day. Workers at ASM sites earn an average of \$9 per day, as compared to an average of \$6 per day for workers at LSM sites (Table 17). The proportion of workers earning below minimum wage (7,075 Congolese Francs per day<sup>78</sup> which is approximately \$3.50 per day) is similar for workers at ASM and LSM sites – 7 percent of workers at ASM sites earn below minimum wage as compared to 8 percent for workers at LSM sites). The average daily pay of those experiencing forced labor (\$6) is lower than that of those not experiencing forced labor (\$9). Ten percent of those experiencing forced labor earn less than minimum wage, and very few workers who do not experience forced labor earn less than minimum wage. On average, earnings rise with years of experience, but there is no association between earnings and education levels.

Most employed workers receive their pay directly from the company (61 percent), and 38 percent receive their pay from an outsourcing agency. Payment by an outsourcing company is much more common among workers at LSM sites (43 percent) than among those at ASM sites (6 percent). The ratio of payment by the company and by an outsourcing agency is similar for those experiencing forced labor and those not experiencing forced labor.

<sup>78</sup> Wage Indicator. Minimum Wage – Congo. 2022. <https://wageindicator.org/salary/minimum-wage/congo>

**Table 17. Form of payment and amount of earnings by type of mine site and by forced labor status (weighted)**

	Type of mine site		Forced labor status		Total % (SE)	Total N
	ASM % (SE)	LSM % (SE)	Forced labor % (SE)	Not forced labor % (SE)		
<b>Median daily earnings (\$)</b>	9.2 (1.5)	6.2 (3.6)	5.8 (0.3)	8.8 (4.2)	8.0 (0.9)	946
<b>Earns below minimum wage (%)</b>	7.4% (2.3)	8.2% (3.4)	9.5% (4.2)	0.8% (0.8) <sup>1</sup>	7.6% (2.2)	946
<b>Who provides payment</b>						339
Company	92.1% (5.7)	55.9% (18.3)	60.2% (18.2)	64.1% (17.5)	61.1% (17.8)	
Outsourcing agency	6.4% (5.2) <sup>1</sup>	43.0% (17.6)	38.6% (17.4)	34.9% (17.9)	37.8% (17.3)	
Other	1.5% (1.6) <sup>1</sup>	1.1% (0.7) <sup>1</sup>	1.2% (0.8) <sup>1</sup>	0.9% (0.9) <sup>1</sup>	1.1% (0.6) <sup>1</sup>	

<sup>1</sup> Fewer than 10 observations were used to calculate this estimate. Estimate should be interpreted with caution.

Table 18 builds on the results presented in Tables 16 and 17 to explore average earnings per hour and per week by type of mine site and by forced labor status. Workers involved in cobalt mining earn an average of \$0.90 per hour and \$42 per week. On average, workers at ASM sites earn more per hour (\$1) and per week (\$42) than those at LSM sites (\$0.70 per hour and \$39 per week). The average hourly and weekly earnings of those experiencing forced labor (\$0.60 per hour and \$35 per week) are lower than those not experiencing forced labor (\$0.80 per hour and \$52 per week).

To put these figures in context, the estimated living income in rural DRC is \$46.88 per week.<sup>79</sup> The living income value is “the estimated monthly cost of a basic but decent standard of living for a typical family in rural DRC,”<sup>80</sup> and the average cobalt mine worker earns close to this amount at \$42 per week. However, the living income estimate is for the entire country, and Haut-Katanga and Lualaba may have a higher cost of living due to their more urban nature and the cost of transporting goods.<sup>81</sup> In addition, the sample includes both rural and urban residents, who likely live in higher cost of living areas. Comparing the average earnings of cobalt mine worker to the living wage value with these limitations in mind, it seems likely that few cobalt miners can afford the “elements of a decent standard of living [which] include: food, water, housing, education, healthcare, transport, clothing, and other essential needs including provision for unexpected events.”<sup>82</sup>

<sup>79</sup> The Living Income Reference Value is \$203 per month (Global Living Wage. Living Income Reference Value — Rural Democratic Republic of Congo. 2022. <https://www.globallivingwage.org/living-income-reference-value-rural-democratic-republic-of-congo/>). Weekly living income calculated by dividing monthly living income by 4.33.

<sup>80</sup> Anker Research Network. Anker Living Income Reference Value: Rural Democratic Republic of Congo 2021. 2021. <https://www.globallivingwage.org/wp-content/uploads/2021/09/Rural-DRC-LI-Reference-Value-FINAL-Sept-13-2021.pdf>

<sup>81</sup> International Crisis Group. RD Congo: dangereuse guerre d'influence dans l'ex-Katanga. June 2, 2017. <https://www.crisisgroup.org/fr/africa/central-africa/democratic-republic-congo/rd-congo-dangereuse-guerre-dinfluence-dans-lex-katanga>; Niarchos, Nicolas. The dark side of Congo's cobalt rush. The New Yorker: May 24, 2021.

<https://www.newyorker.com/magazine/2021/05/31/the-dark-side-of-congos-cobalt-rush>

<sup>82</sup> Living Income Community of Practice, as referenced in Anker Research Network. Anker Living Income Reference Value: Rural Democratic Republic of Congo 2021. 2021. <https://www.globallivingwage.org/wp-content/uploads/2021/09/Rural-DRC-LI-Reference-Value-FINAL-Sept-13-2021.pdf>

**Table 18. Estimated earnings per hour and per week by type of mine site and by forced labor status (weighted)**

	Type of mine site		Forced labor status		Total (SE)
	ASM (SE)	LSM (SE)	Forced labor (SE)	Not forced labor (SE)	
Estimated earnings per hour (\$)	1.0 (0.2)	0.7 (0.3)	0.6 (0.03)	0.8 (0.4)	0.9 (0.1)
Estimated earnings per week (\$)	41.8 (4.7)	38.7 (14.2)	35.1 (2.1)	51.8 (22.8)	41.6 (3.4)
<b>Number of respondents (N)</b>	626	319	251	89	946

Among the most common primary mining activities, the most lucrative is buying and selling ore or other excavated materials (Table 19). These workers earn an average of \$2.80 per hour, compared to \$1.10 per hour for digging ore without machines and \$0.80 per hour for moving mining materials. Those who primarily clean or prepare tools or worksites and those who dig for ore using machines earn \$0.60 per hour.

**Table 19. Pay per hour by primary mining role (weighted)**

	\$ (SE)	N
Buying or selling ore or other excavated materials	2.8 (0.5)	48
Digging ore without machines	1.1 (0.3)	414
Moving materials within the mine site or outside the mine	0.8 (0.7)	71
Cleaning or preparing tools or worksite	0.6 (0.04)	50
Digging for ore using machines	0.6 (0.1)	46

Table 20 presents information about the sale of the excavated minerals. Respondents reported three main types of buyers for the excavated materials: traders, buying houses, and smelters (*fondeurs*). Traders, also referred to as an intermediate (*negociant*), are typically locals (Congolese) who buy minerals from artisanal miners and sell them to buying houses. Buying houses (*dépôts*) are more formal and well-organized sites for the purchase of minerals from artisanal miners and traders. According to Article 123 of DRC Mining code, only Congolese nationals are allowed to trade commodities at the buying house (*dépôt*). Many of these Congolese traders (*negociants*) work as partners with foreign representatives who finance the buying house (*dépôt*). Smelters (*fondeurs*) are individuals or groups without a mining site who buy minerals from miners or buying houses and then process the raw materials to sell to large industrialists. Most workers at ASM sites reported that the minerals are sold to buying houses (*dépôts*) (57 percent) or traders (*negociants*) (53 percent) (multiple responses were allowed). No workers at ASM sites reported sales to smelters. Most workers at LSM sites (56 percent) reported not knowing where the minerals are sold, but 16 percent reported sales to buying houses (*dépôts*), 11 percent reported sales to smelters (*fondeurs*), 6 percent reported sales to traders (*negociants*), and 9 percent reported sales to other places, including international markets and other mining companies.

Among those who know where the minerals are sold, 62 percent reported that the place where the minerals are sold is owned by a Congolese person, and 46 percent reported that the place where the minerals are sold is foreign owned. Multiple responses were allowed, and in some cases, the place where the minerals are sold is co-owned by Congolese and foreign owners. Among foreign-owned places where minerals are sold, 91 percent of owners were Chinese, and 14 percent were Indian (multiple responses were allowed). Nearly all (92 percent) workers experiencing forced labor reported that the minerals they produced are sold to foreign-owned entities (52 percent to Chinese-owned entities, 31 percent to Indian-owned entities).

**Table 20. Mineral sales by type of mine site (weighted)**

	Type of mine site		Total % (SE)
	ASM % (SE)	LSM % (SE)	
<b>Where minerals are sold<sup>1</sup></b>			
Buying house	57.0% (5.3)	15.6% (9.4)	45.2% (5.7)
Trader	53.4% (6.7)	5.5% (4.1)	39.8% (6.3)
Smelter	0.0% (0.0)	11.4% (6.9)	3.2% (1.8)
Other	1.2% (0.5)	9.0% (4.3)	3.5% (1.2)
Don't know	4.1% (2.4)	55.9% (16.8)	18.8% (8.2)
<b>Ownership of place where minerals are sold<sup>1</sup></b>			
Congolese owned	48.1% (5.7)	24.8% (6.5)	46.3% (5.2)
Foreign owned	60.1% (4.9)	80.3% (4.8)	61.7% (4.5)
<b>Number of respondents (N)</b>	626	319	946

<sup>1</sup> Multiple responses possible

### 5.3.5. Child labor

Although the focus of this study is forced labor, child labor is well-documented in cobalt mining in the DRC, including in many academic and media reports, and cobalt ore from the DRC is listed on the United States Department of Labor's *List of Goods Produced by Child Labor or Forced Labor* for child labor. This study asked all respondents whether children work at the mine site where the respondent works. In total, about half of workers (52 percent) work at a mine site where children work (Table 21). Working at a mine site with children is much more common for workers at ASM sites (63 percent) than for those at LSM sites (23 percent).<sup>83</sup>

**Table 21. Whether children work at mine site by type of mine site (weighted)**

	ASM % (SE)	LSM % (SE)	Total % (SE)
Children work at mine site	63.3% (5.4)	23.1% (7.3)	51.9% (5.5)
<b>Number of respondents (N)</b>	625	319	945

<sup>83</sup> These respondent reports are not estimates of child labor prevalence in the sector, but rather should be taken as indications that child labor is an issue in the DRC's cobalt mining sector.

## 6. CONCLUSION

The working conditions of those in the cobalt sector are widely acknowledged to be problematic, but little was previously known about the scale or specifics of these issues. This study helps fill this gap by providing estimates representative of adult cobalt miners in the DRC about demographics, forced labor, hazardous working conditions, and illness and injury.

This study gathered important sociodemographic data on the profile on cobalt miners and their distribution between ASM and LSM sites. Nearly half of workers were born outside of their province of work, and this high rate of migration likely relates to the relatively high earnings of mine workers. Almost twice as many of those working in Lualaba were born outside their province of work, compared to those working in Haut-Katanga. Almost all workers (97 percent) in the population represented by this sample are male, but this study likely underestimates the proportion of women involved in cobalt production more broadly (for example, in auxiliary roles related to cobalt mining).

Nearly three-fourths of workers work at ASM sites, and 28 percent work at LSM sites. Almost all respondents who work at ASM sites are self-employed, whereas almost all respondents who work at LSM sites are employed by employers. On average, workers at ASM sites are slightly younger than those at LSM sites. The majority of workers have at least some formal education. A much higher proportion of workers at LSM sites completed secondary or higher education, compared to workers at ASM sites. The primary mining activities for workers at ASM sites are notably different than those for workers at LSM sites. Digging ore without machines is by far the most common primary mining activity for workers at ASM sites. By contrast, workers at LSM sites perform a wider variety of primary tasks, the most common of which are cleaning or preparing tools or workspaces and digging for ore using machines. Workers engage in an average of 2 mining activities, with workers at ASM sites engaging in slightly more activities (2.2) on average than those at LSM sites (1.6).

The study found that forced labor is widely present among cobalt miners in the DRC. The study identified 251 cases of forced labor, drawing solely from the sub-sample of respondents working for an employer. More than three-fourths (78%) of employed workers experience forced labor. This amounts to an estimated 67,000 to 80,000 cobalt workers in the DRC.

The main indicators of involuntariness are being unable to refuse to do hazardous work, being subjected to abusive overtime requirements to which they have not agreed, and deceptive recruitment. The main indicators of coercion are restrictions on workers' movements, abuse of worker vulnerability (often through dismissal or threats of dismissal), and withholding of wages or other promised benefits. Nearly half of employed workers experience coercion related to overtime, and 40 percent experience coercion related to the requirement to do hazardous work. On average, employed workers experience 1.7 indicators of involuntariness, 1.6 indicators of coercion, and 3.3 total indicators of either involuntariness or coercion.

The study also explored possible associations between Chinese-associated cobalt mines and facilities and forced labor. A majority of respondents lived in close proximity to a Chinese-associated cobalt mine or facility. In turn, the study identified high incidence of forced labor for respondents who lived near Chinese-associated mines and facilities, including the Kasulo and Ruashi mines. Given China's widespread presence in the cobalt industry in the DRC through direct ownership of mine sites and as intermediaries in the supply chain (e.g. trading houses, processing facilities), these findings suggest that Chinese cobalt interests may be associated with the forced labor landscape in the DRC. Further research should be conducted to understand how Chinese-associated businesses may be influencing the labor environment for Congolese workers.

The study explored the relationship between various demographic and job characteristics and forced labor status. The rate of forced labor decreases with increased age, except for the oldest category of

workers, who experience high rates of forced labor similar to the youngest workers. The rates of forced labor are similar for male workers (78 percent) and female workers (80 percent). The primary mining activities with the highest rates of forced labor are digging for ore using machines and cleaning or preparing tools or worksites. Using a multivariate logistic regression model for forced labor to identify the predictors with a significant impact when adjusted for the other predictors, the research found that being paid below minimum wage, having a production quota, and working in Haut-Katanga (versus Lualaba) were significant predictors of forced labor.

Most workers report exposure to multiple hazards—a reality closely linked with vulnerability to forced labor. On average, employed workers who experience forced labor are exposed to more hazards (5.0), compared to employed workers who do not experience forced labor (4.0). Among all workers, the most common hazards are dust or strong fumes without appropriate protective equipment, using dangerous or sharp tools or heavy machinery without appropriate protective equipment, and carrying unreasonably heavy loads. Less than half of workers report usually wearing protective gear. The proportion who report wearing protective gear is much lower for workers at ASM sites than for workers at LSM sites. The proportion who report wearing protective gear is similar for employed workers who do and do not experience forced labor. When asked whether there is protective equipment they do not have that would make them feel safer, two-thirds of all workers answered in the affirmative.

Nearly two-thirds of all workers have gotten hurt or sick because of their work in their most recent job in cobalt mining. The rate of injury or illness is nearly twice as high for workers at ASM sites as it is for workers at LSM sites. Moreover, workers who experience forced labor have more than twice the rate of injury or illness, compared to workers who do not experience forced labor. Among those who have been hurt or injured, the most common type of ailments are injuries to feet, injuries to knees or legs, and injuries to or swelling in hands. The most common ways the injuries or illnesses occur are falling rocks and tool accidents.

Despite these hazards, the average daily pay of cobalt miners is substantially higher than the minimum wage in DRC. Notably, the median daily earnings of those experiencing forced labor are an estimated 41 percent lower than the earnings of those not experiencing forced labor, and 10 percent of those experiencing forced labor earn less than minimum wage in DRC (\$3.50 per day). Among the most common primary mining activities, the most lucrative is buying and selling ore or other excavated materials. These workers earn an average of \$2.80 per hour, compared to \$1.10 per hour for digging ore without machines and \$0.80 per hour for moving mining materials. On average, cobalt workers work 9.5 hours per day, 5 days per week, and they average 51 hours per week. Workers at LSM sites average more hours per week than those at ASM sites, and the number of hours is similar for employed workers who do and do not experience forced labor.

In aggregate, these findings indicate that labor conditions for cobalt mine workers are abominable. They are routinely exposed to a panoply of work-related hazards, most suffer illness or injury related to their work, and many experience forced labor. Policies and interventions seeking to improve working conditions in cobalt mining should target workers at both ASM and LSM sites. Seven in ten workers at LSM sites experience forced labor, and 2 in 10 indicate that children work at their worksite. These rates are even higher among workers at ASM sites, with 8 in 10 experiencing forced labor and 6 in ten reporting that children work at their worksite. Workers at ASM sites are exposed to even more hazardous working conditions with little protective gear, resulting in more frequent injuries and illnesses. Although not measured quantitatively in this study, workers at ASM sites also described to interviewers the danger from armed forces and guards, given that many ASM miners work without legal permission. There is a monumental need to address labor conditions among nearly all cobalt mine workers in the DRC.

This study offers several lessons learned for research with this population and directions for future research. First, it is important to not only to clearly define “mine worker” but also to ensure that the definition is operationalized in the research instrument and in all stages of the research, including in the identification of mining households within villages. Future research should explore the working conditions in auxiliary roles related to cobalt mining and, in particular, the working conditions of women in these roles as well as all labor rights, including freedom of association and collective bargaining. Second, it is important to re-conceptualize how researchers collect information needed to determine forced labor when the target population includes a large proportion of workers who identify as self-employed. Future research should conduct extensive background research to understand the ways involuntariness and coercion may manifest in the work of those who identify as self-employed (e.g., through debt bondage to mining intermediaries) and adapt the research instrument accordingly. Additional research is needed to understand the rate and characteristics of forced labor among cobalt workers who identify as self-employed. Finally, the research found that a sizable proportion of those producing cobalt under conditions of forced labor sell this material to foreign-owned entities, and these labor risks in global supply chains should be explored more deeply in future research.

## APPENDIX A: FORCED LABOR STATISTICAL DEFINITION

Table A-1. Forced labor indicators

Indicator	Statistical definition with relevant question numbers
<b>Involuntariness</b>	
Involuntary work refers to any work taking place without the free and informed consent of the worker	S2Q3 = 2 & S2Q4 = 3, 4, 5, or 6
Circumstances that may give rise to involuntary work, when undertaken under deception or uninformed	S2Q17 = 2
Situations in which the worker must perform a job of different nature from that specified during recruitment without a person's consent	S2Q13 = 2 or S2Q14 = 2
Abusive requirements for overtime or on-call work that were not previously agreed with the employer	S5Q17 = 2 & S5Q18 = 1
Work in hazardous conditions to which the worker has not consented, with or without compensation or protective equipment	S5Q3 = 2
Very low and no wages	S4Q5A = 1
In degrading living conditions imposed by the employer, recruiter, or other third-party	S3Q1B=1 & at least 2: S3Q1C=5, S3Q1D=3, S3Q1E=2, S3Q1F=1, S3Q1G=2, S3Q1H=2
Work for other employers than agreed	S5Q14 = 1
Work with no or limited freedom to terminate work contract	S5Q23 = 2
<b>Coercion</b>	
Threats or violence against workers or workers' families and relatives, or close associates	S2Q4 = 4, 5, 6 or S2Q15 = 4 or S4Q6C = 4 or S5Q4 = 4 or S5Q15 = 4 or S5Q19 = 4 or S5Q24 = 1, 2, 3
Restrictions on workers' movement	S3Q2 = 1 or S3Q3A = 1, 2, 3 or S4Q1A = 8 or S5Q24 = 4
Debt bondage or manipulation of debt	S4Q1A = 2, 3, 4, 7 or S5Q24 = 5
Withholding of wages or other promised benefits	S2Q15 = 1 or S4Q6C = 1 or S5Q4 = 1 or S5Q15 = 1 or S5Q19 = 1 or S5Q24 = 6
Withholding of valuable documents (such as identity documents or residence permits)	S2Q15 = 6 or S4Q1A = 6 or S4Q6C = 6 or S5Q4 = 6 or S5Q15 = 6 or S5Q19 = 6 or S5Q24 = 7
Abuse of workers' vulnerability through the denial of rights or privileges, threats of dismissal or deportation (includes exclusion from future employment, financial penalties)	S2Q4 = 3 or S2Q15 = 2, 3, 5 or S4Q1A = 5 or S4Q6C = 2, 3, 5 or S5Q4 = 2, 3, 5 or S5Q15 = 2, 3, 5 or S5Q19 = 2, 3, 5 or S5Q24 = 8



## APPENDIX B: QUESTIONNAIRE

Response Criteria	English	Swahili	French
ASK ALL	INTERVIEWER: DO NOT READ RESPONSE OPTIONS ALOUD UNLESS INDICATED. LISTEN TO THE RESPONSE AND SELECT THE MOST APPROPRIATE RESPONSE OPTION(S). DO NOT READ UPPERCASE TEXT ALOUD.	ENQUETEUR : NE LISEZ PAS LES OPTIONS DE RÉPONSE À VOIX HAUTE, SAUF INDICATION CONTRAIRE. ÉCOUTEZ LA RÉPONSE ET SÉLECTIONNEZ LA OU LES OPTIONS DE RÉPONSE LES PLUS APPROPRIÉES. NE LISEZ PAS LE TEXTE EN MAJUSCULES À VOIX HAUTE.	ENQUETEUR : NE LISEZ PAS LES OPTIONS DE RÉPONSE À VOIX HAUTE, SAUF INDICATION CONTRAIRE. ÉCOUTEZ LA RÉPONSE ET SÉLECTIONNEZ LA OU LES OPTIONS DE RÉPONSE LES PLUS APPROPRIÉES. NE LISEZ PAS LE TEXTE EN MAJUSCULES À VOIX HAUTE.
ASK ALL	<p>Has at least one member of this household, age 18 or older, worked in mining or in an activity related to mining in the past year?</p> <p>[IF NEEDED: A household is a person or group of persons, related or unrelated, who normally cook, eat, and live together in the same dwelling unit, acknowledge one household head, and share living arrangements.]</p>	<p>Je, angalau mwanakaya mmoja, mwenye umri wa miaka 18 au zaidi, amefanya kazi ya uchimbaji madini au shughuli inayohusiana na uchimbaji madini katika mwaka uliopita?</p> <p>[KAMA INAWEZEKANA : Kaya (ménage) ni mtu ao kikundi a watu wanakuwa wandungu ao apana, ambao kwa kawaida wanapigaka chakuka, wanakulaka na kuishi pamoja katika nyumba moja, wanamtambua mkubwa wa kaya (chef de ménage) na wanachangia hali moja ya maisha].</p>	<p>Au moins un membre de ce ménage, âgé de 18 ans ou plus, a-t-il travaillé dans l'exploitation minière ou dans une activité liée à l'exploitation minière au cours de la dernière année ?</p> <p>[SI NÉCESSAIRE : Un ménage est une personne ou un groupe de personnes, apparentées ou non, qui normalement cuisinent, mangent et vivent ensemble dans la même unité d'habitation, reconnaissent un chef de ménage et partagent les mêmes conditions de vie].</p>
	1. YES	1. NDIYO	1. OUI
	2. NO → END INTERVIEW	2. APANA → END INTERVIEW	2. NON → END INTERVIEW

Response Criteria	English	Swahili	French
ASK ALL	How many members of this household, age 18 or older, have worked in mining or in an activity related to mining in the past year?	Wanamemba wa ngapi wa kaya (menage) hii, wenye wako na miaka 18 ao yulu ya 18 ambao walitumika mu uchimbaji wa madini (minerais) ao katika shughuli zinazoambatana na uchimbaji wa madini katika mwaka jana?	Combien de membres de ce ménage, âgés de 18 ans ou plus, ont travaillé dans l'exploitation minière ou dans une activité liée à l'exploitation minière au cours de l'année passée?
ASK ALL	Please tell me the first name, nickname, or initial of all the members of this household 18 or older who have worked in mining or in an activity related to mining in the past 12 months.	Tafadhali niambie jina la kwanza, lakabu, au herufi ya kwanza ya wanakaya wote wenye umri wa miaka 18 au zaidi ambao wamefanya kazi ya uchimbaji madini au shughuli inayohusiana na uchimbaji madini katika kipindi cha miezi 12 iliyopita.	Veillez m'indiquer le prénom, le surnom ou l'initiale de tous les membres de ce ménage âgés de 18 ans ou plus qui ont travaillé dans l'exploitation minière ou dans une activité liée à l'exploitation minière au cours des 12 derniers mois.

### SECTION I: GENERAL INFORMATION

ASK ALL	SIQ1. How old are you?  [IF NEEDED, SAY: Your best guess is fine]	SIQ1. Una miaka ngapi?  [KAMA INAHITAJIKA, SEMA: Estimation yako bora ni sawa]	SIQ1. Quel âge avez-vous ?  [SI NÉCESSAIRE, DITES : Votre meilleure estimation est bonne]
	RECORD AGE IN YEARS	RECORD AGE IN YEARS	RECORD AGE IN YEARS
ASK ALL	SIQ2.  INTERVIEWER: MARK RESPONDENT'S GENDER. ASK IF UNSURE.	SIQ2.  MHOJI/ENQUETEUR: MARQUE SEXE YA WAKUJIBU. ULIZA KAMA HAUNA UHAKIKA.	SIQ2.  ENQUETEUR : MARQUEZ LE SEXE DU RÉPONDANT. DEMANDEZ SI INCERTAIN.
	1. MALE	1. MWANAUME	1. HOMME
	2. FEMALE	2. MWANAMUKE	2. FEMME

Response Criteria	English	Swahili	French
ASK ALL	SIQ3. Where were you born?	SIQ3. Ulizaliwaka wapi?	SIQ3. Où êtes-vous né(e)?
	1. DEMOCRATIC REPUBLIC OF THE CONGO	1. JAMHURI YA KIDEMOKRASIA YA KONGO/RDC	1. RÉPUBLIQUE DÉMOCRATIQUE DU CONGO
	2. OTHER COUNTRY	2. NCHI NYINGINE	2. AUTRE PAYS
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF SIQ3 = 1 (DRC)	SIQ3A. In which province in the Democratic Republic of the Congo were you born?	SIQ3A. Ulizaliwaka mu province gani ya Jamhuri ya Kidemokrasia ya Kongo/RDC?	SIQ3A. Dans quelle province de la République démocratique du Congo êtes-vous né(e)?
	1. BAS-UELE	1. BAS-UELE	1. BAS-UELE
	2. ÉQUATEUR	2. ÉQUATEUR	2. ÉQUATEUR
	3. HAUT-KATANGA	3. HAUT-KATANGA	3. HAUT-KATANGA
	4. HAUT-LOMAMI	4. HAUT-LOMAMI	4. HAUT-LOMAMI
	5. HAUT-UELE	5. HAUT-UELE	5. HAUT-UELE
	6. ITURI	6. ITURI	6. ITURI
	7. KASAÏ	7. KASAÏ	7. KASAÏ
	8. KASAÏ-CENTRAL	8. KASAÏ-CENTRAL	8. KASAÏ-CENTRAL
	9. KASAÏ-ORIENTAL	9. KASAÏ-ORIENTAL	9. KASAÏ-ORIENTAL
	10. KINSHASA	10. KINSHASA	10. KINSHASA
	11. KONGO CENTRAL	11. KONGO CENTRAL	11. KONGO CENTRAL
	12. KWANGO	12. KWANGO	12. KWANGO
	13. KWILU	13. KWILU	13. KWILU
	14. LOMAMI	14. LOMAMI	14. LOMAMI

Response Criteria	English	Swahili	French
	15. LUALABA	15. LUALABA	15. LUALABA
	16. MAI-NDOMBE	16. MAI-NDOMBE	16. MAI-NDOMBE
	17. MANIEMA	17. MANIEMA	17. MANIEMA
	18. MONGALA	18. MONGALA	18. MONGALA
	19. NORD-UBANGI	19. NORD-UBANGI	19. NORD-UBANGI
	20. NORTH KIVU	20. NORTH KIVU	20. NORTH KIVU
	21. SANKURU	21. SANKURU	21. SANKURU
	22. SOUTH KIVU	22. SOUTH KIVU	22. SOUTH KIVU
	23. SUD-UBANGI	23. SUD-UBANGI	23. SUD-UBANGI
	24. TANGANYIKA	24. TANGANYIKA	24. TANGANYIKA
	25. TSHOPO	25. TSHOPO	25. TSHOPO
	26. TSHUAPA	26. TSHUAPA	26. TSHUAPA
	27. OTHER	29. MWENGINE	27. AUTRE
	77. DON'T KNOW	77. SIJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSE
ASK IF SIQ3 = 2 (OTHER COUNTRY )	SIQ3_OTHER. RECORD OTHER COUNTRY OF BIRTH  [ENTER 77 FOR "DON'T KNOW" ENTER 99 FOR "REFUSED"]	SIQ3_YENGINE. ONESHA INCHI YENGINE ALIZALIWAKA AMO  [ENTER 77 FOR "DON'T KNOW" ENTER 99 FOR "REFUSED"]	SIQ3_AUTRE. INDIQUER AUTRE PAYS DE NAISSANCE  [ENTER 77 FOR "DON'T KNOW" ENTER 99 FOR "REFUSED"]
ASK IF SIQ3 = 1 (DRC)	SIQ4. What is your tribe?	SIQ4. Uko wa kabila gani?	SIQ4. Quelle est votre tribu?
	I. BAKONGO DU NORD & DU SUD DU FLEUVE	I. BAKONGO DU NORD & DU SUD DU FLEUVE	I. BAKONGO DU NORD & DU SUD DU FLEUVE

Response Criteria	English	Swahili	French
	2. BAS-KASAÏ & KWILU-KWANGO	2. BAS-KASAÏ & KWILU-KWANGO	2. BAS-KASAÏ & KWILU-KWANGO
	3. CUVETTE CENTRALE	3. CUVETTE CENTRALE	3. CUVETTE CENTRALE
	4. UBANGI & ITIMBIRI-NGIRI	4. UBANGI & ITIMBIRI-NGIRI	4. UBANGI & ITIMBIRI-NGIRI
	5. UELE; LAC ALBERT	5. UELE; LAC ALBERT	5. UELE; LAC ALBERT
	6. BASELE-KOMO, MANIEMA & KIVU	6. BASELE-KOMO, MANIEMA & KIVU	6. BASELE-KOMO, MANIEMA & KIVU
	7. KASAÏ; KATANGA; TANGANYIKA	7. KASAÏ; KATANGA; TANGANYIKA	7. KASAÏ; KATANGA; TANGANYIKA
	8. LUNDA	8. LUNDA	8. LUNDA
	9. PYGMÉE	9. PYGMÉE	9. PYGMÉE
	11. AUSHI (K)	11. AUSHI (K)	11. AUSHI (K)
	12. BANGUBANGU (M)	12. BANGUBANGU (M)	12. BANGUBANGU (M)
	13. BANYAMULENGE (S)	13. BANYAMULENGE (S)	13. BANYAMULENGE (S)
	14. BEMBA (K)	14. BEMBA (K)	14. BEMBA (K)
	15. BEMBE (S)	15. BEMBE (S)	15. BEMBE (S)
	16. BUWA (K)	16. BUWA (K)	16. BUWA (K)
	17. BUYU (K)	17. BUYU (K)	17. BUYU (K)
	18. BWILE (K)	18. BWILE (K)	18. BWILE (K)
	19. CHOKWE (K)	19. CHOKWE (K)	19. CHOKWE (K)
	20. FULIRU (S)	20. FULIRU (S)	20. FULIRU (S)
	21. HAVU (S)	21. HAVU (S)	21. HAVU (S)
	22. HEMBA (K)	22. HEMBA (K)	22. HEMBA (K)
	23. HOLOHOLO (K)	23. HOLOHOLO (K)	23. HOLOHOLO (K)
	24. JOBA (K)	24. JOBA (K)	24. JOBA (K)

Response Criteria	English	Swahili	French
	25. KABWARI (K)	25. KABWARI (K)	25. KABWARI (K)
	26. KANU	26. KANU	26. KANU
	27. KAONDE (K)	27. KAONDE (K)	27. KAONDE (K)
	28. LAL-BISA (K)	28. LAL-BISA (K)	28. LAL-BISA (K)
	29. LAMBA (K)	29. LAMBA (K)	29. LAMBA (K)
	30. LEGA (S,M)	30. LEGA (S,M)	30. LEGA (S,M)
	31. LUBA-KASAI (K)	31. LUBA-KASAI (K)	31. LUBA-KASAI (K)
	32. LUBA-KATANGA (K)	32. LUBA-KATANGA (K)	32. LUBA-KATANGA (K)
	33. LUNDA (K)	33. LUNDA (K)	33. LUNDA (K)
	34. NYINDU	34. NYINDU	34. NYINDU
	35. RUUND (K)	35. RUUND (K)	35. RUUND (K)
	36. SANGA (K)	36. SANGA (K)	36. SANGA (K)
	37. SHI (S)	37. SHI (S)	37. SHI (S)
	38. TAABWA (K)	38. TAABWA (K)	38. TAABWA (K)
	39. TEMBO (S)	39. TEMBO (S)	39. TEMBO (S)
	40. TETELA (M)	40. TETELA (M)	40. TETELA (M)
	41. VIRA (S)	41. VIRA (S)	41. VIRA (S)
	42. KIKUSU	42. KIKUSU	42. KIKUSU
	43. KINANDE	43. KINANDE	43. KINANDE
	44. KIHUNDE	44. KIHUNDE	44. KIHUNDE
	45. KINYABUISHA	45. KINYABUISHA	45. KINYABUISHA
	46. KIRWANDA	46. KIRWANDA	46. KIRWANDA
	47. KINYARWANDA	47. KINYARWANDA	47. KINYARWANDA
	48. DU'ALUR	48. DU'ALUR	48. DU'ALUR

Response Criteria	English	Swahili	French
	49. KILENDU	49. KILENDU	49. KILENDU
	50. KINGITI	50. KINGITI	50. KINGITI
	51. KINYALI	51. KINYALI	51. KINYALI
	52. KILESE	52. KILESE	52. KILESE
	53. KICHEMA	53. KICHEMA	53. KICHEMA
	54. KIMBUTI	54. KIMBUTI	54. KIMBUTI
	55. NDO'OKEBO	55. NDO'OKEBO	55. NDO'OKEBO
	56. KAKWA	56. KAKWA	56. KAKWA
	57. LUGBARATI	57. LUGBARATI	57. LUGBARATI
	58. KALIKO	58. KALIKO	58. KALIKO
	59. KIBILA	59. KIBILA	59. KIBILA
	60. KINDAKA	60. KINDAKA	60. KINDAKA
	61. SWAHILI	61. SWAHILI	61. SWAHILI
	62. FRANÇAIS	62. FRANÇAIS	62. FRANÇAIS
	63. LINGALA	63. LINGALA	63. LINGALA
	64. KIBIRA	64. KIBIRA	64. KIBIRA
	65. KILOGO	65. KILOGO	65. KILOGO
	66. ABARAMBO	66. ABARAMBO	66. ABARAMBO
	67. AMADI	67. AMADI	67. AMADI
	68. BARI	68. BARI	68. BARI
	69. DONGO	69. DONGO	69. DONGO
	70. GBANGBA	70. GBANGBA	70. GBANGBA
	71. KIBALI	71. KIBALI	71. KIBALI
	72. KIBANGO	72. KIBANGO	72. KIBANGO

Response Criteria	English	Swahili	French
	73. KIBATI	73. KIBATI	73. KIBATI
	74. KIBENGE	74. KIBENGE	74. KIBENGE
	75. KIBENZA	75. KIBENZA	75. KIBENZA
	76. KIBOA	76. KIBOA	76. KIBOA
	77. KIBUDU	77. KIBUDU	77. KIBUDU
	78. KIGEGERE	78. KIGEGERE	78. KIGEGERE
	79. KIGENYA	79. KIGENYA	79. KIGENYA
	80. KIKANGO	80. KIKANGO	80. KIKANGO
	81. KIKERE	81. KIKERE	81. KIKERE
	82. KIKUMBI	82. KIKUMBI	82. KIKUMBI
	83. KIKUMU	83. KIKUMU	83. KIKUMU
	84. KILEKA	84. KILEKA	84. KILEKA
	85. KILELE	85. KILELE	85. KILELE
	86. KILENGOLA	86. KILENGOLA	86. KILENGOLA
	87. KIMANGA	87. KIMANGA	87. KIMANGA
	88. KIMBESA	88. KIMBESA	88. KIMBESA
	89. KIMBOLE	89. KIMBOLE	89. KIMBOLE
	90. KIMBUDJA	90. KIMBUDJA	90. KIMBUDJA
	91. KINGANDO	91. KINGANDO	91. KINGANDO
	92. KINGBE	92. KINGBE	92. KINGBE
	93. KINGBINDA	93. KINGBINDA	93. KINGBINDA
	94. KINGELEMA	94. KINGELEMA	94. KINGELEMA
	95. KINGWANDI	95. KINGWANDI	95. KINGWANDI
	96. KISOKO	96. KISOKO	96. KISOKO



Response Criteria	English	Swahili	French
	97. KIZANDE	97. KIZANDE	97. KIZANDE
	98. LESE	98. LESE	98. LESE
	99. LIKA	99. LIKA	99. LIKA
	100. LINGALA	100. LINGALA	100. LINGALA
	101. LOKELE	101. LOKELE	101. LOKELE
	102. MANGBUTU	102. MANGBUTU	102. MANGBUTU
	103. MITUKU	103. MITUKU	103. MITUKU
	104. MONDO	104. MONDO	104. MONDO
	105. NGBETU	105. NGBETU	105. NGBETU
	106. NZAKARA	106. NZAKARA	106. NZAKARA
	107. POPOYI	107. POPOYI	107. POPOYI
	108. TOPOKE	108. TOPOKE	108. TOPOKE
	109. TURUMBU	109. TURUMBU	109. TURUMBU
	110. YOGO	110. YOGO	110. YOGO
	777. DON'T KNOW	777. HAJUE	777. NE SAIT PAS
	999. REFUSED	999. ALIKATALA	999. A REFUSE
ASK ALL	SIQ5. Do you have any children of your own?	SIQ5. Uko na watoto wako?	SIQ5. Avez-vous des enfants propres à vous?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSE

Response Criteria	English	Swahili	French
ASK ALL	SIQ6. What is your marital status now?	SIQ6. Ulishaka owa/uko marié?	SIQ6. Quel est votre état civil/marital actuel?
	1. MARRIED OR CO-HABITATING	1. MARIÉ(E) AO MUNAIKALA NA MWENZAKO	1. MARIÉ(E) OU COHABITANT(E)
	2. DIVORCED OR SEPARATED	2. DIVORCÉ(E) AO SÉPARÉ(E)	2. DIVORCÉ(E) OU SÉPARÉ(E)
	3. WIDOWED	3. MJANE	3. VEUF(VE)
	4. NEVER MARRIED AND NEVER LIVED WITH ANYONE	4. HAJAWAHI KUOA NA HAJAWAHI KUISHI NA MTU	4. JAMAIS MARIÉ(E) ET N'A JAMAIS VÉCU AVEC QUELQU'UN
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	SIQ7. How many people live in your permanent household, including yourself?  [INTERVIEWER IF NEEDED: Permanent household refers to the household you consider to be your permanent residence, regardless of how long you are away. It may or may not be where you are living and working at the time of the interview.]	SIQ7. Ni watu wangapi wanaishi katika kaya/menage yako ya kila siku, pamoja na wewe mwenyewe?  [MUHOJI IKIHITAJIWA: Kaya ya kudumu/ya kila siku inamaanisha kaya unayoiona kuwa residence yako ya kudumu, bila kujali uko mbali kwa muda gani. Inaweza kuwa mahali unapoishi na kufanya kazi wakati wa mahojiano(enquete)]	SIQ7. Combien de personnes vivent dans votre ménage permanent, y compris vous-même?  [ENQUETEUR SI NÉCESSAIRE: Le ménage permanent désigne le ménage que vous considérez comme votre résidence permanente, quelle que soit la durée de votre absence. Il peut s'agir ou non de l'endroit où vous vivez et travaillez au moment de l'enquête].
	NUMBER	NUMBER	NUMBER

Response Criteria	English	Swahili	French
ASK IF SIQ7 > 1	SIQ8. What is your relationship with the head of household in your permanent household?	SIQ8. Una uhusiano gani na mkuu wa kaya katika kaya yako ya kudumu?	SIQ8. Quel est votre lien avec le chef de famille de votre ménage permanent?
	1. HOUSEHOLD (HH) HEAD	1. SHEFU WA MENAGE	1. CHEF DE MENAGE
	2. PARTNER OF HH HEAD	2. BIBI WA SHEFU WA MENAGE	2. PARTENAIRE DU CHEF DE MENAGE
	3. SON	3. MWANA/GARCON	3. FILS
	4. DAUGHTER	4. BINTI/FILLE	4. FILLE
	5. MOTHER OF THE HH HEAD	5. MAMA WA SHEFU WA MENAGE	5. MÈRE DU CHEF DU MENAGE
	6. FATHER OF THE HH HEAD	6. BABA WA SHEFU WA MENAGE	6. PÈRE DU CHEF DU MENAGE
	7. MOTHER OF THE SPOUSE	7. MAMAYAKE NA BWANA	7. LA MÈRE DU CONJOINT
	8. FATHER OF THE SPOUSE	8. BABAYAKE NA BWANA	8. LE PÈRE DU CONJOINT
	9. BROTHER OF THE HH HEAD	9. KAKA YAKE NA SHEFU WA MENAGE	9. FRÈRE DU CHEF DE MENAGE
	10. SISTER OF THE HH HEAD	10. DADA YAKE NA SHEFU WA MENAGE	10. SŒUR DU CHEF DE MENAGE
	11. BROTHER OF THE SPOUSE	11. KAKA YAKE NA BWANA	11. FRÈRE DU CONJOINT
	12. SISTER OF THE SPOUSE	12. DADA YAKE NA BWANA	12. SŒUR DU CONJOINT
	13. UNCLE	13. MJOMBA	13. ONCLE
	14. AUNT	14. SHANGAZI	14. TANTE
	15. COUSIN	15. BINAMU/COUSIN	15. COUSIN
	16. NEPHEW	16. NEVEU	16. NEVEU
	17. NIECE	17. NIECE	17. NIECE

Response Criteria	English	Swahili	French
	18. GRANDSON	18. MJUKUU/PETIT FILS	18. PETIT FILS
	19. GRANDDAUGHTER	19. MJUKUU/PETITE FILLE	19. PETITE-FILLE
	20. SON IN LAW	20. MKWE/BEAU-FILS	20. BEAU-FILS
	21. DAUGHTER IN LAW	21. BINTI/BELLE-FILLE	21. BELLE-FILLE
	22. STEPSON	22. MTOTO WA BWANA AO WA BIBI/FILS	22. FILS DU CONJOINT/ DE LA CONJOINTE
	23. STEPDAUGHTER	23. BINTI WA BWANA AO WA BIBI/FILLE	23. FILLE DU CONJOINT/ DE LA CONJOINTE
	24. OTHER RELATIVE	24. MWANAMEMBA MWENGINE WA JAMAA	24. AUTRE MEMBRE DE LA FAMILLE
	25. OTHER NON-RELATIVE	25. MWENGINE ASIYE KUWA NDUGU	25. AUTRE MEMBRE (NON APPARENTE)
	26. MOTHER	26. MAMA	26. MÈRE
	27. FATHER	27. BABA	27. PÈRE
	28. BROTHER / SISTER	28. KAKA/DADA	28. FRÈRE / SŒUR
	29. OTHER	29. MWENGINE	29. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	SIQ9. Have you ever attended school?	SIQ9. Je, umewahi kuhudhuria shule?	SIQ9. Avez-vous déjà fréquenté l'école?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK IF SIQ9 = 1 (YES)	SIQ10. What is the highest class you have completed?	SIQ10. Uliishiaka mu classe gani ya yulu zaidi?	SIQ10. Quelle est la classe la plus élevée que vous ayez complétée?
	1. PRESCHOOL/NURSERY SCHOOL	1. ECOLE MATERNELLE	1. PRÉSCOLAIRE/ÉCOLE MATERNELLE
	2. SOME PRIMARY	2. SHULE YA MSINGI/ECOLE PRIMAIRE KIDOGO	2. UN PEU DE PRIMAIRE
	3. COMPLETED PRIMARY	3. KUMALIZA SHULE YA MSINGI/ECOLE PRIMAIRE	3. PRIMAIRE TERMINÉ
	4. SOME SECONDARY	4. SHULE YA SEKONDARI KIDOGO/ECOLE SECONDAIRE KIDOGO	4. UN PEU DE SECONDAIRE
	5. COMPLETED SECONDARY OR HIGHER	5. KUMALIZA SHULE YA SEKONDARI/ECOLE SECONDAIRE	5. SECONDAIRE COMPLET OU PLUS
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	SIQ11. What is your religious affiliation?	SIQ11. Uko wa dini gani?	SIQ11. Quelle est votre appartenance religieuse?
	1. CHRISTIAN: CATHOLIC	1. MKRISTO: KATOLIKI	1. CHRÉTIEN : CATHOLIQUE
	2. CHRISTIAN: PROTESTANT (INCLUDING METHODIST)	2. MKRISTO: MPROTESTANT (Y COMPRIS METHODISTE)	2. CHRÉTIEN : PROTESTANT (Y COMPRIS METHODISTE)
	3. CHRISTIAN: KIMBANGUIST	3. MKRISTO: KIMBANGUISTE	3. CHRÉTIEN : KIMBANGUISTE
	4. MUSLIM	4. MUISLAMU	4. MUSULMAN
	5. HINDUISM	5. MHINDU	5. HINDOUISME

Response Criteria	English	Swahili	French
	6. SYNCRETIC SECTS OR INDIGENOUS BELIEFS	6. MAZEHEBU YA UWIANO/SECTES SYNCRETIQUES AO IMANI ZA KIENYEJI	6. SECTES SYNCRÉTIQUES OU CROYANCES INDIGÈNES
	7. REVIVAL CHURCH	7. EGLISE DU REVEIL	7. EGLISE DU REVEIL
	8. NEW APOSTOLIC CHURCH	8. NEO APOSTOLIQUE	8. NEO APOSTOLIQUE
	9. JEHOVAH WITNESS	9. TEMOIN DE JEHOVA	9. TEMOIN DE JEHOVA
	10. OTHER	10. YENGINE	10. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	GI_READ.  READ: For the following questions, please think about your most recent job working in the mining industry. If you had more than one job, think about your main job.	GI_SOMA. SOMA: Kwa maswali yafuatayo, tafazali fikiria kuhusu kazi yako ya jana jana secteur ya madini. Ikiwa ulikuwa na kazi zaidi ya moja, fikiria juu ya kazi yako kuu.	GI_LIRE.LIRE: Pour les questions suivantes, veuillez penser à votre emploi le plus récent dans le secteur minier. Si vous avez eu plus d'un emploi, pensez à votre emploi principal.
ASK ALL	SIQ12.  Do you work for an employer or for yourself?	SIQ12.  Je, unatumikia mtu ao unajitumikia weye mwenyewe?	SIQ12.  Travaillez-vous pour un employeur ou pour vous-même?
	1. EMPLOYER	1. MWENYE KUPANA KAZI	1. EMPLOYEUR
	2. SELF	2. KUJITUMIKIA/INDEPENDANT	2. AUTO-EMPLOI/POUR VOUS-MEME (INDEPENDANT)
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK ALL	SIQ13.  Approximately when did you start this work?  [INTERVIEWER: SELECT MONTH (IF KNOWN)]	SIQ13.  Karibuni mwezi gani ulianza kazi hii?  [INTERVIEWER: SELECT MONTH (IF KNOWN)]	SIQ13.  Approximativement, quand avez-vous commencé ce travail?  [INTERVIEWER: SELECT MONTH (IF KNOWN)]
	1. JANUARY	1. JANVIER	1. JANVIER
	2. FEBRUARY	2. FÉVRIER	2. FÉVRIER
	3. MARCH	3. MARS	3. MARS
	4. APRIL	4. AVRIL	4. AVRIL
	5. MAY	5. MAI	5. MAI
	6. JUNE	6. JUIN	6. JUIN
	7. JULY	7. JUILLET	7. JUILLET
	8. AUGUST	8. AOÛT	8. AOÛT
	9. SEPTEMBER	9. SEPTEMBRE	9. SEPTEMBRE
	10. OCTOBER	10. OCTOBRE	10. OCTOBRE
	11. NOVEMBER	11. NOVEMBRE	11. NOVEMBRE
	12. DECEMBER	12. DÉCEMBRE	12. DÉCEMBRE
ASK ALL	SIQ13_YEAR.  YEAR	SIQ13_MWAKA.  MWAKA	SIQ13_ANNEE.  ANNEE
ASK ALL	SIQ14.  Do you still have this job?	SIQ14.  Ungaliki natumika ile kazi?	SIQ14.  Avez-vous toujours cet emploi?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS

Response Criteria	English	Swahili	French
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF SIQ14 > 1	SIQ15. Approximately when did you stop working this job?  [INTERVIEWER: SELECT MONTH (IF KNOWN)]	SIQ15. Karibuni mwezi gani uliacha kufanya kazi hii?  [INTERVIEWER: SELECT MONTH (IF KNOWN)]	SIQ15. Approximativement, quand avez-vous cessé d'exercer cet emploi ?  [INTERVIEWER: SELECT MONTH (IF KNOWN)]
	1. JANUARY	1. JANVIER	1. JANVIER
	2. FEBRUARY	2. FÉVRIER	2. FÉVRIER
	3. MARCH	3. MARS	3. MARS
	4. APRIL	4. AVRIL	4. AVRIL
	5. MAY	5. MAI	5. MAI
	6. JUNE	6. JUIN	6. JUIN
	7. JULY	7. JUILLET	7. JUILLET
	8. AUGUST	8. AOÛT	8. AOÛT
	9. SEPTEMBER	9. SEPTEMBRE	9. SEPTEMBRE
	10. OCTOBER	10. OCTOBRE	10. OCTOBRE
	11. NOVEMBER	11. NOVEMBRE	11. NOVEMBRE
	12. DECEMBER	12. DÉCEMBRE	12. DÉCEMBRE
ASK IF SIQ14 > 1	SIQ15_YEAR. YEAR	SIQ15_MWAKA. MWAKA	SIQ15_ANNÉE. ANNÉE
ASK ALL	SIQ16.  What type of mine site do you work at? Is it artisanal, small scale, or industrial?	SIQ16.  Je, unafanya kazi kwenye site ya madini ya aina gani? Je, ni ufundi/artisanal, wadogo/petite echelle, au viwanda/grande echelle?	SIQ16.  Sur quel type de site minier travaillez-vous ? Est-il artisanal, à petite échelle ou industriel?



Response Criteria	English	Swahili	French
	1. ARTISINAL (MINE ARTISANALE)	1. ARTISANAL (MINE ARTISANALE)	1. ARTISANAL (MINE ARTISANALE)
	2. SMALL SCALE/SEMI INDUSTRIAL (LA PETITE MINE/SEMI INDUSTRIAL)	2. KIWANDA KIDOGO(PETITE ECHELLE)/NUSU KIWANDA (LA PETITE MINE/SEMI INDUSTRIEL)	2. PETITE ECHELLE/SEMI INDUSTRIEL(LA PETITE MINE/SEMI INDUSTRIEL)
	3. INDUSTRIAL/LARGE-SCALE (MINE INDUSTRIELLE)	3. KIWANDA(INDUSTRIEL)/KI WANGO KUBWA/GRANDE ECHELLE (MINE INDUSTRIELLE)	3. INDUSTRIELLE/GRANDE ECHELLE (MINE INDUSTRIELLE)
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF SIQ14 = 1 (YES)	SIQ17. What materials or minerals are mined or produced there? [SELECT ALL THAT APPLY]	SIQ17. Ni madini gani yanachimbwa huko? [CHAGUA YOTE YANAYOTUMIKA]	SIQ17. Quels matériaux ou minéraux y sont extraits(exploités) ou produits? [SÉLECTIONNEZ TOUT CE QUI S'APPLIQUE]
	1. COBALT	1. COBALT	1. COBALT
	2. COPPER	2. CUIVRE	2. CUIVRE
	3. OTHER	3. YENGINE	3. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF SIQ17 = 3	SIQ17_OTHER. RECORD OTHER	SIQ17_YENGINE. HAKIKISHA YENGINE/PRECISER YENGINE	SIQ17_AUTRE. PRECISER AUTRE

Response Criteria	English	Swahili	French
ASK IF SIQ14 = 1 (YES)	SIQ18.  In which of these activities have you engaged in the past month?  READ ALOUD RESPONSE OPTIONS AND SELECT ALL THAT APPLY	SIQ18.  Ni shughuli gani kati ya hizi umejishughulisha katika mwezi jana?  SOMA CHAGUO ZA MAJIBU KWA SAUTI NA UCHAGUE YOTE YANAYOTUMIKA	SIQ18.  Dans lesquelles de ces activités avez vous travaillé (exercé) au cours du mois dernier?  LISEZ À HAUTE VOIX LES OPTIONS DE RÉPONSE ET SÉLECTIONNEZ TOUTES CELLES QUI S'APPLIQUENT
	1. Buying or selling ore or other excavated materials	1. Kuuza ao kuuzisha madini ao vifaa vingine vilivyochimbwa	1. Achat ou vente de minerai ou d'autres matériaux extraits
	2. Washing materials	2. Vifaa vya kusukula	2. Le lavage des matériaux
	3. Crushing rocks	3. kusaga miamba/majibu	3. Le concassage de roches
	4. Digging for ore using machines	4. Kuchimba madini kwa kutumia mashine	4. Creuser du minerai à l'aide de machines
	5. Digging for ore without machines	5. Kuchimba madini bila mashine	5. Creuser du minerai sans machines
	6. Moving materials within the mine site or outside the mine	6. Déplacement ao kuhamishia ndani ya site ya minerai ao inje ya site ya minerai	6. Déplacement de matériaux à l'intérieur du site minier ou à l'extérieur de la mine
	7. Cleaning or preparing tools or workspaces	7. Kusafisha ao kuandaa vifaa ao maeneo ya kazi	7. Nettoyer ou préparer des outils ou des espaces de travail
	8. Selling food or drinks to mine workers	8. Kuuza chakula ao vinywaji kwa wafanyakazi wa site ya minerai	8. Vendre de la nourriture ou des boissons aux travailleurs de la mine
	9. Selling other items or services to mine workers (not food or drinks)	9. Kuuza vitu ao huduma zengine kwa wafanyakazi wa mines (sio chakula ao vinywaji)	9. Vendre d'autres articles ou services aux travailleurs des mines (pas de nourriture ni de boissons).
	10. Guarding a mine or mined materials	10. Kulinda mine ao minerais za kuchimbwa	10. Garder une mine ou des matériaux extraits

Response Criteria	English	Swahili	French
	11. Supervising mine workers	11. Kusimamia wafanyakazi wa mine	11. Superviser les travailleurs des mines
	12. Administrative work related to the mine (as a mine employee)	12. Kazi ya administration/utawala inayohusiana na mine (kama mfanyakazi wa mgoji)	12. Travail administratif lié à la mine (en tant qu'employé de la mine)
	13. Administrative work related to the mine (on behalf of the government)	13. Kazi ya administration/utawala inayohusiana na mine (kwa niaba ya serikali)	13. Travail administratif lié à la mine (pour le compte du gouvernement)
	14. Other work related to mining	14. Kazi zengine zinazohusiana na mine	14. Autres travaux liés à la mine
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF SIQ18 = 9 (OTHER)	SIQ18_OTHER_ITEMS. Please specify other items or services to mine workers.	SIQ18_OTHER_ITEMS. Please specify other items or services to mine workers.	SIQ18_OTHER_ITEMS. Please specify other items or services to mine workers.
ASK IF SIQ18 = 14 (OTHER)	SIQ18_OTHER_WORK. Please specify other work related to mining.	SIQ18_OTHER_WORK. Please specify other work related to mining.	SIQ18_OTHER_WORK. Please specify other work related to mining.
ASK IF SIQ14 = 1 AND SIQ18 ≠ 77 OR 99	SIQ19. On which of these activities do (did) you spend the most time?	SIQ19. Ya wapi mu ma activites izi inakuchukuwa (ilikuchukuwa) muda mingi sana?	SIQ19. Laquelle de ces activités vous fait (a fait) passer le plus de temps ?
	1. Buying or selling ore or other excavated materials	1. Kuuza ao kuuzisha madini ao vifaa vingine vilivyochimbwa	1. Achat ou vente de minerai ou d'autres matériaux extraits
	2. Washing materials	2. Vifaa vya kusukula	2. Le lavage des matériaux
	3. Crushing rocks	3. kusaga miamba/majibu	3. Le concassage de roches
	4. Digging for ore using machines	4. Kuchimba madini kwa kutumia mashine	4. Creuser du minerai avec machines

Response Criteria	English	Swahili	French
	5. Digging for ore without machines	5. Kuchimba madini bila mashine	4. Creuser du minerai sans machines
	6. Moving materials within the mine site or outside the mine	6. Deplacement ao kuhamishia ndani ya site ya minerai ao inje ya site ya minerai	6. Déplacement de matériaux à l'intérieur du site minier ou à l'extérieur de la mine
	7. Cleaning or preparing tools or workspaces	7. Kusafisha ao kuandaa vifaa ao maeneo ya kazi	7. Nettoyer ou préparer des outils ou des espaces de travail
	8. Selling food or drinks to mine workers	8. Kuuza chakula ao vinywaji kwa wafanyakazi wa site ya minerai	8. Vendre de la nourriture ou des boissons aux travailleurs de la mine
	9. Selling other items or services to mine workers : \${SIQ18_OTHER_ITEMS}	9. Kuuza vitu ao huduma zengine kwa wafanyakazi wa mines (sio chakula ao vinywaji)	9. Vendre d'autres articles ou services aux travailleurs des mines (pas de nourriture ni de boissons).
	10. Guarding a mine or mined materials	10. Kulinda mine ao minerais za kuchimbwa	10. Garder une mine ou des matériaux extraits
	11. Supervising mine workers	11. Kusimamia wafanyakazi wa mine	11. Superviser les travailleurs des mines
	12. Administrative work related to the mine	12. Kazi ya administration/utawala inayohusiana na mine	12. Travail administratif lié à la mine
	13. Other work related to mining : \${SIQ18_OTHER_WORK}	13. Kazi zengine zinazohusiana na mine	13. Autres travaux liés à la mine
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
<b>SECTION 2: RECRUITMENT</b>			
ASK IF S1Q12 = 1 (EMPLOYER)	<p>S2Q1.</p> <p>Next we would like to ask you a few questions about how you started in your job.</p> <p>Did anyone help you get this job?</p>	<p>S2Q1.</p> <p>Kisha tungependa kukuuliza maswali machache kuhusu jinsi ulivyoanza katika kazi yako.</p> <p>Kuna mtu alikusaidia kupata kazi hii?</p>	<p>S2Q1.</p> <p>Ensuite, nous aimerions vous poser quelques questions sur la façon dont vous avez débuté dans votre emploi.</p> <p>Quelqu'un vous a-t-il aidé à obtenir cet emploi ?</p>
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q1 = 1 (YES)	<p>S2Q2.</p> <p>Who helped you get this job? INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY</p>	<p>S2Q2.</p> <p>Nani alikusaidia kupata kazi hii? MHOJI/ENQUETEUR: CHAGUA YOTE YANAYOTUMIKA</p>	<p>S2Q2.</p> <p>Qui vous a aidé à obtenir cet emploi?  ENQUETEUR : SÉLECTIONNEZ TOUT CE QUI S'APPLIQUE</p>
	1. FAMILY MEMBER	1. MWANAMEMBA WA FAMILIA	1. MEMBRE DE LA FAMILLE
	2. FRIEND	2. RAFIKI	2. AMI
	3. COMMUNITY LEADER/ INFLUENTIAL PERSON	3. KIONGOZI WA JUMUIYA/COMMUNAUTE / MTU MWENYE USHAWISHI	3. RESPONSABLE DE LA COMMUNAUTÉ / PERSONNE INFLUENTE
	4. RECRUITMENT AGENT	4. WAKALA WA AJIRA/AGENT DE RECRUTEMENT	4. AGENT DE RECRUTEMENT
	5. OTHER	5. MWENGINE	5. AUTRE

Response Criteria	English	Swahili	French
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q2 = 5 (OTHER)	S2Q2_OTHER. Please specify	S2Q2_YENGINE. Tafazali onyesha yengine	S2Q2_AUTRE. Veuillez préciser autre
ASK IF SIQ12 = 1 (EMPLOYEE)	S2.Q3. Were you free to refuse to work for this employer?	S2.Q3. Je, ulikuwa huru kukatala kutumikia huyu mwenye kazi?	S2.Q3. Etiez-vous libre de refuser de travailler pour cet employeur?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q3 = 2, 77, OR 88	S2.Q4. What might have happened if you refused?	S2.Q4. Ungekatala, nini ingetokea?	S2.Q4. Que se serait-il passé si vous aviez refusé?
	1. NOTHING	1. HAKUNA	1. RIEN
	2. WORK OPPORTUNITIES ARE SCARCE/WOULD HAVE NO MONEY/ETC	2. NAFASI ZA KAZI HAZIONEKANE/SINGEKUWA NA PESA/ETC.	2. LES OPPORTUNITÉS DE TRAVAIL SONT RARES/JE N'AURAI PAS D'ARGENT/ETC.
	3. EMPLOYER WOULD HAVE TRIED TO PREVENT OTHER EMPLOYERS IN THE AREA FROM HIRING ME	3. MWENYE KUPANA KAZI ANGEJARIBU KUWAZUIA WAPANA KAZI WENGINE KATIKA ENEO HILO KUKUPA KAZI.	3. L'EMPLOYEUR AURAIT ESSAYÉ D'EMPÊCHER D'AUTRES EMPLOYEURS DE LA RÉGION DE M'EMBAUCHER.
	4. EMPLOYER WOULD HAVE CAUSED OTHER PEOPLE FROM MY FAMILY TO LOSE THEIR JOBS	4. MWENYE KUPANA KAZI ANGEWAFANYA WATU WENGINE KUTOKA KWA FAMILIA YANGU KUPOTEZA KAZI.	4. L'EMPLOYEUR AURAIT FAIT PERDRE LEUR EMPLOI À D'AUTRES MEMBRES DE MA FAMILLE.

Response Criteria	English	Swahili	French
	5. EMPLOYER WOULD HAVE CAUSED MY FAMILY TO LOSE ACCESS TO LAND OR OTHER ASSETS	5. MWENYE KUPANA KAZI AO BOSI WANGU ANGESABABISHA FAMILIA YANGU KUKOSA UPATIKANAJI WA SHAMBA/TERRE AO MALI YENGINE.	5. L'EMPLOYEUR AURAIT FAIT PERDRE À MA FAMILLE L'ACCÈS À LA TERRE OU À D'AUTRES BIENS.
	6. EMPLOYER WOULD HAVE THREATENED VIOLENCE AGAINST MYSELF OR MY FAMILY	6. MWAJIRI/BOSI ANGENITISHIA UKATILI/VIOLENCE MWENYEWWE AO FAMILIA YANGU.	6. L'EMPLOYEUR AURAIT MENACÉ DE RECOURIR À LA VIOLENCE CONTRE MOI OU MA FAMILLE.
	7. OTHER	8. MWENGINE	8. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q4 = 7 (OTHER)	S2.Q4_OTHER. Please specify	S2.Q4_MWENGINE. Tafazali onyesha yengine	S2.Q4_AUTRE. Veuillez préciser autre
ASK IF SIQ12 = 1 (EMPLOYER)	S2Q5. Did you have to pay any recruitment or placement fees to get your job?	S2Q5. Je, ulilazimika kulipa pesa yoyote ya recruitment ao kuweka nafasi ili kupata kazi yako?	S2Q5. Avez-vous dû payer des frais de recrutement ou de placement pour obtenir votre emploi?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q5 = 1 (YES)	S2Q6. How much did you pay in recruitment fees in dollars?	S2Q6. Ulilipa ngapi ju ya recrutement mu dollars?	S2Q6. Combien avez-vous payé de frais de recrutement en dollars?
	AMOUNT IN DOLLARS	AMOUNT IN DOLLARS	AMOUNT IN DOLLARS

Response Criteria	English	Swahili	French
ASK IF S2Q5 = 1 (YES)	S2Q7. Did you have to borrow any money to pay the fees to get your job?	S2Q7. Je, ulilazimika kujikopesha pesa yoyote ili kulipa frais fulani ili kupata kazi yako?	S2Q7. Avez-vous dû emprunter de l'argent pour payer les frais pour obtenir votre emploi?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q7 = 1 (YES)	S2Q8. From whom did you borrow?  [INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY]	S2Q8. Ulijikopesha kwa nani?  [MUHOJI/ENQUETEUR: SIKILIZA NA UCHAGUE YOTE YANAYOTUMIKA]	S2Q8. Auprès de qui avez-vous emprunté?  [ENQUÊTEUR : ÉCOUTEZ ET SÉLECTIONNEZ TOUT CE QUI S'APPLIQUE]
	1. FAMILY OR FRIEND	1. FAMILIA AO RAFIKI	1. FAMILLE OU AMI(E)
	2. RECRUITER	2. MWAJIRI/RECRUTEUR	2. RECRUTEUR
	3. EMPLOYER	3. MWAJIRI/BOSI	3. EMPLOYEUR
	4. EMPLOYMENT AGENT	4. WAKALA WA AJIRA/AGENT D'EMPLOI	4. AGENT D'EMPLOI
	5. MICROFINANCE AGENCY	5. AGENCE YA MICROFINANCE	5. AGENCE DE MICROFINANCE
	6. BANK	6. BENKI/BANQUE	6. BANQUE
	7. MONEY LENDER	7. MKOPESHAJI WA PESA/PRETEUR D'ARGENT	7. PRÊTEUR D'ARGENT
	8. OTHER	8. MWENGINE	8. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ



Response Criteria	English	Swahili	French
ASK IF S2Q8 = 8 (OTHER)	S2Q8_OTHER. Please specify	S2Q8_YENGINE. Tafazali onyesha yengine	S2Q8_AUTRE. Veuillez préciser autre
ASK IF SIQ12 = 1 (EMPLOYEE)	S2Q9. Do (did) you have a contract for this job?	S2Q9. Je, (ulikuwa) na mkataba/contrat wa kazi hii?	S2Q9. Avez-vous (aviez) un contrat pour cet emploi?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q9 = 1 (YES)	S2Q10. What type of contract do you have? Is it a daily contract, a fixed-term contract, or a permanent contract?	S2Q10. Je, una mkataba/contrat wa aina gani? Je, ni mkataba wa kila siku, mkataba wa muda maalum(duree determinee), au mkataba wa kudumu (duree indeterminee)?	S2Q10. Quel type de contrat avez-vous? S'agit-il d'un contrat journalier, d'un contrat à durée déterminée ou d'un contrat à durée indéterminée?
	1. DAILY CONTRACT (CONTRAT DE JOURNALIER)	1. MKATABA WA KILA SIKU (CONTRAT DE JOURNALIER)	1. CONTRAT DE JOURNALIER
	2. TIME-BOUND/FIXED TERM CONTRACT (CONTRAT DE TRAVAIL A DUREE DETERMINEE)	2. MKATABA WA MUDA/MUDA ULIOSISHI (CONTRAT DE TRAVAIL A DUREE DETERMINEE)	2. CONTRAT DE TRAVAIL A DUREE DETERMINEE
	3. PERMANENT CONTRACT (CONTRAT DE TRAVAIL A DUREE INDETERMINEE)	3. MKATABA WA KUDUMU (CONTRAT DE TRAVAIL A DUREE INDETERMINEE)	3. CONTRAT DE TRAVAIL À DURÉE INDÉTERMINÉE (CONTRAT PERMANENT)
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK IF S1Q12 = 1 (EMPLOYER)	S2Q11. Before you started the job, did you receive information about the nature of the work you would be doing from a recruiter or your employer?	S2Q11. Mbele ya kuanza kazi hiyo, je, ulipokea mafasirio kuhusu aina ya kazi ambayo ungekuwa unafanya kutoka kwa mwajiri/bosi au recruteur wako?	S2Q11. Avant de commencer à travailler, avez-vous reçu des informations sur la nature du travail que vous feriez de la part d'un recruteur ou de votre employeur?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q11 = 1 (YES)	S2Q12. Is the nature of your work different from how it was described to you by a recruiter or your employer before you started?	S2Q12. Hali/aina ya kazi yako iko tofauti na jinsi ilivyoelezwa kwako na mwajiri/bosi au mwajiri wako mbele ya kuanza?	S2Q12. La nature de votre travail est-elle différente de celle qui vous a été décrite par un recruteur ou votre employeur avant que vous ne commenciez?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q12 = 1 (YES)	S2Q13. Did the employer ask for your agreement before changing the nature of the work?	S2Q13. Bosi aliomba makubaliano yako mbele ya kubadilisha aina ya kazi?	S2Q13. L'employeur a-t-il demandé votre accord avant de modifier la nature du travail?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS

Response Criteria	English	Swahili	French
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q12 = 1 (YES)	S2Q14. Could you have refused the change in the nature of the work?	S2Q14. Je, ungeweza kukataa mabadiliko katika hali/aina ya kazi?	S2Q14. Auriez-vous pu refuser le changement de la nature du travail?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q14 = 2 (NO)	S2Q15. What might happen if you refused?  [INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY]	S2Q15. Nini inaweza kutokea ukekatala?  [MUHOJI/ENQUÊTEUR: SIKILIZA NA UCHAGUE YOTE YANAYOTUMIKA]	S2Q15. Que pourrait-il se passer si vous refusiez?  [ENQUÊTEUR : ÉCOUTEZ ET SÉLECTIONNEZ TOUT CE QUI S'APPLIQUE]
	1. WITHHOLDING OF WAGES OR OTHER PROMISED BENEFITS	1. KUZUIA MSHAHARA AO MA AVANTAGES ZENGINE ILIYOAHIDIWA	1. RETENUE DU SALAIRE OU D'AUTRES AVANTAGES PROMIS
	2. DENIAL OF RIGHTS OR PRIVILEGES	2. KUMUJIMA HAKI AO UPENDELEO	2. REFUS DE DROITS OU DE PRIVILÈGES
	3. FINE OR DEDUCTION FROM WAGES	3. AMENDE AO AU KUPUNGUZWA KWA MSHAHARA	3. AMENDE OU RETENUE SUR LE SALAIRE
	4. THREATS OR VIOLENCE AGAINST RESPONDENT OR RESPONDENT'S FAMILY	4. VITISHO AO VIOLENCE CONTRE MWENYE KUJIBU AO FAMILIA YAKE MHOJIWA.	4. MENACES OU VIOLENCE CONTRE LE REpondant OU SA FAMILLE
	5. DISMISSAL OR THREATS OF DISMISSAL	5. KUFUKUZWA AO VITISHO(MENACE) VYA KUFUKUZWA MU KAZI	5. LICENCIEMENT OU MENACES DE LICENCIEMENT

Response Criteria	English	Swahili	French
	6. WITHHOLDING OF VALUABLE DOCUMENTS (SUCH AS IDENTITY DOCUMENTS, SCHOOL CERTIFICATES, OR RESIDENCE PERMITS)	6. KUZUIWA KU MA DOCUMENTS ZA VALEUR (KAMA DOCUMENTS ZA VITAMBULISHO, DOCUMENTS ZA SHULE, AO VIBALI VYA MAKAZI)	6. RÉTENTION DE DOCUMENTS DE VALEUR (TELS QUE DES DOCUMENTS D'IDENTITÉ, DES CERTIFICATS SCOLAIRES OU DES PERMIS DE SÉJOUR/RESIDENCE)
	7. OTHER	7. YENGINE	7. AUTRE
	8. NOTHING	8. HAKUNA	8. RIEN
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S2Q15 = 2	S2Q15_OTHER_RP. Which rights or privileges would be denied?	S2Q15_YENGINE_RP. Haki ao marupurupu yangekataliwa?	S2Q15_AUTRE_RP. Quels droits ou privilèges seraient refusés ?
ASK IF S2Q15 = 7 (OTHER)	S2Q15_OTHER. Please specify	S2Q15_YENGINE. Tafazali onyesha yengine	S2Q15_AUTRE. Veuillez préciser autre
ASK IF SIQ12 = 1 (EMPLOYER)	S2Q16. Before you started the job, did you receive information about what your earnings would be from a recruiter or your employer?	S2Q16. Mbele ya kuanza kazi, je, ulipokea mafasirio kuhusu malipo yako kutoka kwa boshi ao mwajiri wako?	S2Q16. Avant de commencer à travailler, avez-vous reçu des informations sur vos revenus (eg: salaires) de la part d'un recruteur ou de votre employeur?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK IF S2Q16 = 1 (YES)	S2Q17. Were your actual earnings higher, lower, or as promised by a recruiter or your employer?	S2Q17. Je, malipo yako ya kweli yalikuwa ya juu, ya chini, au kama yalivyoahidiwa na bosu au mwajiri wako?	S2Q17. Vos revenus réels étaient-ils supérieurs, inférieurs ou conformes aux promesses d'un recruteur ou de votre employeur?
	1. HIGHER	1. JUU	1. PLUS ÉLEVÉ
	2. LOWER	2. CHINI	2. INFÉRIEURE
	3. AS PROMISED	3. KAMA ILIVYOAHIDIWA	3. COMME PROMIS
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
<b>SECTION 3: LIVING CONDITIONS</b>			
ASK IF S1Q12 = 1 (EMPLOYEE R)	S3Q1. Does (Did) your employer, recruiter, or agent provide your housing?	S3Q1. Je, Bosu wako, mwajiri, au agent mwenye alikupa kazi anakupa nyumba kwa kuishi?	S3Q1. Votre employeur, votre recruteur ou votre agent vous fournit-il (elle) le logement/vous donne-t-il une maison de logement?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S3Q1 = 1 (YES)	S3Q1A. Could you have lived somewhere else and still work at your job?	S3Q1A. Je, ungeweza kuishi fasi yengine na bado unatumika mu kazi yako?	S3Q1A. Auriez-vous pu vivre ailleurs et continuer à exercer votre métier ?
	1. YES	1. NDIYO	1. OUI

Response Criteria	English	Swahili	French
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S3Q1A = 2 (NO)	S3Q1B. Why not?  [INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY]	S3Q1B. Kwa nini apana?  [INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY]	S3Q1B. Pourquoi pas?  [INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY]
	1. EMPLOYER, MANAGER, OR RECRUITER WOULD NOT LET ME/ THEY REQUIRE THAT I LIVE HERE	1. BOSI, DIRECTEUR, AO RECRUTEUR HAWANIACHA/ WANALAZIMISHA KUISHI HAPA.	1. L'EMPLOYEUR, LE DIRECTEUR OU LE RECRUTEUR NE ME LAISSERAIT PAS FAIRE/ ILS EXIGENT QUE JE VIVE ICI
	2. I CAN'T AFFORD TO LIVE SOMEWHERE ELSE	2. SIWEZI KUMUDU JIRUHUSU/SINA POSSIBILITE YA KUISHI FASI YENGINE	2. JE NE PEUX PAS ME PERMETTRE/JE N'AI PAS LA POSSIBILITE DE VIVRE AILLEURS
	3. I CAN'T FIND ANOTHER PLACE	3. SIWEZI KUPATA FASI YENGINE	3. JE NE PEUX PAS TROUVER UN AUTRE ENDROIT
	4. OTHER	4. YENGINE	4. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S3Q1B = 4 (OTHER)	S3Q1B_OTHER. Please specify	S3Q1B_YENGINE. Tafazali onyesh yengine	S3Q1B_AUTRE. Veuillez préciser
ASK ALL	S3Q1C.  How would you describe the quality of your accommodations? Would you say very good, good, bad, or very bad?	S3Q1C.  Namna gani njo unaweza kueleze ubora wa nyumba unayo ishi ndani Unaweza kusema ni nzuri sana, nzuri, mbaya ao mbaya sana?	S3Q1C.  Comment décririez-vous la qualité de votre logement? Diriez-vous très bonne, bonne, mauvaise ou très mauvaise?

Response Criteria	English	Swahili	French
	1. VERY GOOD	1. NZURI SANA	1. TRÈS BIEN
	2. GOOD	2. NZURI/BIEN	2. BIEN
	3. NEUTRAL (NEITHER GOOD NOR BAD)	3. NEUTRE (SIO NZURI WALA MUBAYA)	3. NEUTRE (NI BON NI MAUVAIS)
	4. BAD	4. MUBAYA	4. MAUVAIS
	5. VERY BAD	5. MUBAYA SANA	5. TRÈS MAUVAIS
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	S3Q1D.  On average, how many people sleep (slept) in the room you sleep in?	S3Q1D.  En moyenne, ni watu wangapi wanalala (walilala) mu chumba yenye unalalaka amo?	S3Q1D.  En moyenne, combien de personnes dorment (ont dormi) dans la chambre où vous dormez?
	1-4 PEOPLE	WATU 1-4	1-4 PERSONNES
	5-8 PEOPLE	WATU 5-8	5-8 PERSONNES
	9 OR MORE PEOPLE	WATU 9 AO ZAIDI	9 PERSONNES OU PLUS
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	S3Q1E.  Do (Did) you have access to clean drinking water in or near your housing?	S3Q1E.  Ulikuwa na maji safi ya kunywa ndani ao karibu na nyumba yako?	S3Q1E.  Avez-vous (aviez-vous) accès à de l'eau potable dans ou près de votre logement?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK ALL	S3Q1F. Does (Did) your housing have any major water leaks?	S3Q1F. Jenyumba yako inavuyaka (ilikuwa navuya) sana?	S3Q1F. Votre logement présente-t-il (présentait-il) des fuites d'eau importantes?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	S3Q1G. Do (Did) you feel safe in your housing?	S3Q1G. Je unajisikiaka salama/ ulijisikia salama mu nyumba yako?	S3Q1G. Vous sentez-vous (vous sentiez) en sécurité dans votre logement?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	S3Q1H. Do (Did) you have a safe space in your housing to store your belongings?	S3Q1H. Je ulikuwa na nafasi salama mu nyumba yako ya panga vitu vyako?	S3Q1H. Disposez-vous (disposiez-vous) d'un espace sûr dans votre logement pour ranger vos affaires?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ



Response Criteria	English	Swahili	French
ASK IF SIQ12 = 1 (EMPLOYEE R)	S3Q2. During working hours, are you prevented from leaving your work place by guards or fences?	S3Q2. Wakati wa saa za kazi, je, walinzi ao ma lupango zinakuzuia kutoka mu kazi?	S3Q2. Pendant les heures de travail, des gardes ou des clôtures vous empêchent-ils de quitter votre lieu de travail?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF SIQ12 = 1 (EMPLOYEE R)	S3Q3. Are you free to leave the area of your work place outside of work hours?	S3Q3. Je, uko huru kuondoka eneo la kazi yako inje ya saa za kazi?	S3Q3. Êtes-vous libre de quitter la zone de votre lieu de travail en dehors des heures de travail?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S3Q3 = 2 (NO)	S3Q3A. Who prevents you from coming and going outside of work hours?  [INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY]	S3Q3A. Ni nani anayekuzuia kukuya na kutoka inje ya saa za kazi?  [INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY]	S3Q3A. Qui vous empêche d'aller et venir en dehors des heures de travail?  [INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY]
	1. EMPLOYER/MANAGER/WORKPLACE SECURITY	1. BOSI/DIRECTEUR/WALIINDA USALAMA KU KAZI	1. L'EMPLOYEUR/LE GÉRANT/LA SÉCURITÉ DU LIEU DE TRAVAIL
	2. RECRUITER	2. MWAJIRI/RECRUTEUR	2. RECRUTEUR

Response Criteria	English	Swahili	French
	3. OUTSOURCING AGENCY	3. WAKALA WA UTUMISHI/AGENCE DE SOUS TRAITANCE	3. AGENCE DE SOUS TRAITANCE
	4. FAMILY/SPOUSE	4. FAMILIA/BIBI AO BWANA	4. FAMILLE/CONJOINT
	5. OTHER	5. MWENGINE	5. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S3Q3A = 5 (OTHER)	S3Q3A_OTHER. Please specify	S3Q3A_NYINGINE. Tafadhali fafania	S3Q3A_AUTRE. Veuillez préciser
<b>SECTION 4: DEBT AND PAYMENT</b>			
ASK IF SIQ12 = 1 (EMPLOYER)	S4Q1. Sometimes employees are in debt to their employers, for example after receiving a pay advance. While working in your most recent job, were you ever in debt to your employer or recruiter?	S4Q1. Inafakaka wakati yenye wafanyakazi wanakuwa na deni ya boshi wao, kwa mfano nyuma ya kupokea malipo/avance sur salaire. kwa kazi yako ya jana jana, uliwahi kuwa na deni ya boshi wako ao ya recruteur wako?	S4Q1. Il arrive que des employés aient des dettes envers leur employeur, par exemple après avoir reçu une avance sur salaire. Lors de votre emploi le plus récent, avez-vous déjà eu des dettes envers votre employeur ou votre recruteur?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S4Q1 = 1 (YES)	S4Q1A. If you were to leave your job before paying off your debt, what might happen?	S4Q1A. Kama ungeacha kazi yako mbele ya kulipa deni yako, nini inaweza kutokea?	S4Q1A. Si vous deviez quitter votre emploi avant d'avoir remboursé votre dette, que se passerait-il?

Response Criteria	English	Swahili	French
	1. NOTHING	1. HAKUNA	1. RIEN
	2. I WOULD BE ARRESTED OR PROSECUTED	2. NINGEKAMATWA NA KUFUNGWA AO KUSHITAKIWA	2. JE SERAIS ARRÊTÉ(E) OU POURSUIVI(E)
	3. I OR MY FAMILY WOULD BE IN PERSONAL DANGER	3. MIMI AO FAMILIA YANGU TUNGEKUWA KATIKA HATARI BINAFSI	3. JE SERAIS PERSONNELLEMENT EN DANGER OU MA FAMILLE LE SERAIT
	4. EMPLOYER WOULD HAVE CAUSED MY FAMILY TO LOSE ACCESS TO LAND OR OTHER ASSETS	4. BOSI ANGESABABISHA FAMILIA YANGU KUKOSA UPATIKANAJI WA SHAMBA/TERRE AO MALI YENGINE.	4. L'EMPLOYEUR AURAIT FAIT PERDRE À MA FAMILLE L'ACCÈS À DES TERRES OU À D'AUTRES BIENS
	5. EMPLOYER WOULD HAVE TRIED TO PREVENT OTHER EMPLOYERS IN THE AREA FROM HIRING ME	5. BOSI ANGEJARIBU KUWAZUIA WA BOSI WENGINE KATIKA ENEO HILO KUNIPA KAZI.	5. L'EMPLOYEUR AURAIT ESSAYÉ D'EMPÊCHER D'AUTRES EMPLOYEURS DE LA RÉGION DE M'EMBAUCHER.
	6. WITHHOLDING OF VALUABLE DOCUMENTS(SUCH AS IDENTITY DOCUMENTS, SCHOOL CERTIFICATES, OR RESIDENCE PERMITS)	6. KUZUIWA KWA MA DOCUMENTS ZA VALEUR(kama vile VITAMBULISHO, VYETI VYA SHULE, AO VIBALI VYA MAKAZI)	6. RÉTENTION DE DOCUMENTS DE VALEUR (TELS QUE DES DOCUMENTS D'IDENTITÉ, DES CERTIFICATS DE SCOLARITÉ OU DES PERMIS DE RESIDENCE).
	7. WITHHOLDING OF MATERIAL GOODS AS COLLATERAL	7. KUKANGA VIFAA AO VITU FULANI KUWA GARANTIE	7. RÉTENTION DE BIENS MATÉRIELS COMME GARANTIE
	8. EMPLOYER WOULD PHYSICALLY PREVENT MY LEAVING	8. BOSI ANGNENIZUIA KUONDOKA	8. L'EMPLOYEUR EMPÊCHERAIT PHYSIQUEMENT MON DÉPART
	9. OTHER	9. YENGINE	9. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK IF S4Q1A = 9 (OTHER)	S4Q1A_OTHER. Please specify	S4Q1A_YENGINE. Tafazali onyesha yengine	S4Q1A_AUTRE. Veuillez préciser
ASK IF SIQ12 = 1 (EMPLOYEE)	S4Q2. Now I would like to ask who pays you. Are you paid by the company itself, an outsourcing agency, a family member, or someone else?	S4Q2. Sasa ningependa kuuliza nani anakulipaka. Je, unalipwa na kampuni/entreprise ao societe yenyewe, wala na agence ya sous-traitance, mwanamemba wa familia ao mtu mwengine?	S4Q2. Je voudrais maintenant vous demander qui vous paie. Êtes-vous payé par l'entreprise elle-même, par une agence de sous-traitance, par un membre de votre famille ou par quelqu'un d'autre?
	1. COMPANY	1. ENTREPRISE	1. L'ENTREPRISE
	2. OUTSOURCING AGENCY	2. WAKALA WA UTUMISHI/AGENCE YA SOUS-TRAITANCE	2. AGENCE DE SOUS-TRAITANCE
	3. FAMILY MEMBER	3. MWANAMEMBA WA FAMILIA	3. MEMBRE DE LA FAMILLE
	4. SOMEONE ELSE	4. MTU MWENGINE	4. QUELQU'UN D'AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S4Q2 = 4 (OTHER)	S4Q2_OTHER. Please specify	S4Q2_YENGINE. Tafazali onyesha yengine	S4Q2_AUTRE. Veuillez préciser
ASK ALL	S4Q3. Do you belong to a mining cooperative?	S4Q3. Je, wewe ni mwanamemba wa cooperative ya madini?	S4Q3. Faites-vous partie d'une coopérative minière?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
	Part 3		
ASK ALL	S4Q4. Are you typically paid in money, in minerals, both in money and in minerals, or some other way?	S4Q4. Je, kwa kawaida unalipiwaka mu pesa, madini, ao ni pesa na madini, ao kwa njia yengine yengine?	S4Q4. Êtes-vous généralement payé en argent, en minerais, à la fois en argent et en minerais, ou d'une autre manière?
	1. MONEY	1. PESA	1. ARGENT
	2. MINERALS	2. MADINI	2. MINERAUX
	3. MONEY AND MINERALS	3. PESA NA MADINI	3. L'ARGENT ET LES MINERAUX
	4. SOME OTHER WAY	4. NJIA YENGINE	4. D'UNE AUTRE MANIÈRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S4Q4 = 4 (SOME OTHER WAY)	S4Q4_OTHER. Please specify	S4Q4_YENGINE. Tafazali onyesha	S4Q4_AUTRE. Veuillez préciser

Response Criteria	English	Swahili	French
ASK ALL	<p>S4Q5.</p> <p>Now I would like to ask you about your earnings. Please only include the earnings from your basic wages, not any overtime pay or bonuses you may receive. Include only the amount you take home, after any deductions by your employer. About how much do you earn in dollars for a typical day's work?</p> <p>INTERVIEWER: IF RESPONDENT IS PAID IN KIND OR IN ANOTHER CURRANCY, ASK RESPONDENT TO ESTIMATE VALUE IN DOLLARS</p>	<p>S4Q5.</p> <p>Sasa ningependa kukuuliza kuhusu mapato/revenus yako. Tafazali ongelea tu mapato kutoka kwa mushahara yako ya msingi/salaire de base, apana malipo yoyote ya saa ya ziada/heures supplementaires ao primes unaweza kupokea. Ongelea tu kiasi ya pesa unabeba nu yumba kisha kutosha ma deni fulani fulani ya bosi wako. Karibuni ngapi ya dollars kwa kazi ya siku ya kawaidi?</p> <p>MHOJI/ENQUETEUR: KAMA ENQUETEE/MHOJIWA ANALIPIWAKA EN NATURE KWA AINA AO KWA FEZA YENGINE, MUULIZE ANAWAZIA NI NGAPI MU DOLLARS AMERICAINS</p>	<p>S4Q5.</p> <p>Je voudrais maintenant vous demander quels sont vos revenus. Veuillez n'inclure que les gains provenant de votre salaire de base, et non pas la rémunération des heures supplémentaires ou les primes que vous pouvez recevoir. N'incluez que le montant que vous ramenez à la maison, après les déductions éventuelles de votre employeur. A peu près combien gagnez-vous en dollars pour une journée de travail normale?</p> <p>ENQUETEUR : SI LA PERSONNE INTERROGÉE EST PAYÉE EN NATURE OU DANS UNE AUTRE DEVISE, DEMANDEZ-LUI D'ESTIMER LA VALEUR EN DOLLARS.</p>
	AMOUNT IN DOLLARS	AMOUNT IN DOLLARS	AMOUNT IN DOLLARS
ASK ALL	<p>S4Q5A.</p> <p>On a typical day, are your earnings less than \$3.50 (7,075 CDF)?</p> <p>INTERVIEWER: IF RESPONDENT IS PAID IN KIND, ASK RESPONDENT TO ESTIMATE WHETHER VALUE IS LESS THAN \$3.50 / 7,075 CDF</p>	<p>S4Q5A.</p> <p>Kwa siku ya kawaida, je, mapato yako ni chini ya \$3.50 (7075 FC)?</p> <p>MHOJI/ENQUETEUR: KAMA ANALIPIWAKA EN NATURE, MUULIZE KAMA INAWEZA KUWA CHINI YA 3.50 / 7075 FC</p>	<p>S4Q5A.</p> <p>Au cours d'une journée normale, vos revenus sont-ils inférieurs à 3,50 \$ (7,075 CDF)?</p> <p>ENQUETEUR : SI LE RÉPONDANT EST PAYÉ EN NATURE, DEMANDER AU RÉPONDANT D'ESTIMER SI LA VALEUR EST INFÉRIEURE À 3,50 \$/7 075 CDF.</p>
	I. YES	I. NDIYO	I. OUI

Response Criteria	English	Swahili	French
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF SIQ12 = 1 (EMPLOYER)	S4Q6. Does your employer impose a production quota/target?	S4Q6. Je, boshi wako anaweka kiwango/lengo ya production/uzalishaji?	S4Q6. Votre employeur impose-t-il un quota/cible de production?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S4Q6 = 1 (YES)	S4Q6A. What is the quota/target?	S4Q6A. Je, kiwango/lengo ni nini?	S4Q6A. Quel est le quota/cible?
	AMOUNT	AMOUNT	AMOUNT
ASK IF S4Q6 = 1 (YES)	INDICATE THE UNIT OF MEASUREMENT	INDIQUER L'UNITÉ DE MESURE	INDIQUER L'UNITÉ DE MESURE
	1. KG	1. KG	1. KG
	2. TONES	2. TONES	2. TONES
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S4Q6 = 1 (YES)	S4Q6B. Do you consider the quota/target to be a reasonable amount for an individual worker working alone?	S4Q6B. Je, unaona kiwango/lengo kuwa kiasi kinastahili kwa mfanyakazi binafsi anayefanya kazi peke yake?	S4Q6B. Considérez-vous que le quota/cible est un montant raisonnable pour un travailleur individuel travaillant seul?
	1. YES	1. NDIYO	1. OUI

Response Criteria	English	Swahili	French
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S4Q6 = 1 (YES)	S4Q6C. What might happen if you fail to meet the quota/target?	S4Q6C. Je, nini inaweza kutokea ikiwa utashindwa kufikia kiwango/lengwa?	S4Q6C. Que pourrait-il se passer si vous n'atteigniez pas le quota/cible?
	1. WITHHOLDING OF WAGES OR OTHER PROMISED BENEFITS	1. KUZUIA MSHAHARA AO MA AVANTAGES ZENGINE ILIYOAHIDIWA	1. RETENUE DE SALAIRE OU D'AUTRES AVANTAGES PROMIS
	2. DENIAL OF RIGHTS OR PRIVILEGES	2. KUMUJIMA HAKI AO UPENDELEO	2. REFUS DE DROITS OU DE PRIVILÈGES
	3. FINE OR DEDUCTION FROM WAGES	3. AMENDE AO AU KUPUNGUZWA KWA MSHAHARA	3. AMENDE OU RETENUE SUR LE SALAIRE
	4. THREATS OR VIOLENCE AGAINST RESPONDENT OR RESPONDENT'S FAMILY	4. VITISHO AO VIOLENCE CONTRE MWENYE KUJIBU AO FAMILIA YAKE MHOJIWA.	4. MENACES OU VIOLENCE CONTRE LE DÉFENDEUR OU SA FAMILLE
	5. DISMISSAL OR THREATS OF DISMISSAL	5. KUFUKUZWA AO VITISHO(MENACE) VYA KUFUKUZWA MU KAZI	5. LICENCIEMENT OU MENACES DE LICENCIEMENT
	6. WITHHOLDING OF VALUABLE DOCUMENTS (SUCH AS IDENTITY DOCUMENTS, SCHOOL CERTIFICATES, OR RESIDENCE PERMITS)	6. KUZUIWA KU MA DOCUMENTS ZA VALEUR (KAMA DOCUMENTS ZA VITAMBULISHO, DOCUMENTS ZA SHULE, AO VIBALI VYA MAKAZI)	6. RÉTENTION DE DOCUMENTS DE VALEUR (TELS QUE DES DOCUMENTS D'IDENTITÉ, DES CERTIFICATS SCOLAIRES OU DES PERMIS DE SÉJOUR)
	7. OTHER	7. YENGINE	7. AUTRE
	8. NOTHING	8. HAKUNA	8. RIEN
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ



Response Criteria	English	Swahili	French
ASK IF S4Q6C = 2	S4Q6C_OTHER_RP.  Which rights or privileges would be denied?	S4Q6_YENGINE_RP.  Haki ao marupurupu hayangenipewa?	S4Q6_AUTRE_RP.  Quels droits ou privilèges vous seraient refusés?
ASK IF S4Q6C = 7 (OTHER)	S4Q6C_OTHER.  Please specify	S4Q6C_YENGINE.  Tafazali onyesha	S4Q6C_AUTRE.  Veuillez préciser
ASK ALL	S4Q7.  Where do you sell the products of your mining work?  INTERVIEWER: SELECT ALL THAT APPLY	Unauzishiaka wapi ma products za kazi yako ya uchimbaji wa madini?  MHOJI/ENQUETEUR: CHAGUA YOTE YANAYOTUMIKA	Où vendez-vous les produits de votre travail dans les mines?  ENQUETEUR : SÉLECTIONNEZ TOUT CE QUI S'APPLIQUE
	1. BUYING HOUSE (MAISON D'ACHAT)	1. NYUMBA YA KUZUIYA (MAISON D'ACHAT)	1. MAISON D'ACHAT (BUYING HOUSE)
	2. TRADER	2. NEGOCIANT	2. NEGOCIANT
	3. FOUNDER	3. FONDEUR	3. FONDEUR
	4. OTHER	4. YENGINE	4. AUTRE
	66. NOT SOLD	66. HAIUZIWE	66. PAS VENDU
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S4Q7 = 4 (OTHER)	S4Q7_OTHER.  Please specify	S4Q7_YENGINE.  Tafazali onyesha	S4Q7_AUTRE.  Veuillez préciser
ASK IF S4Q7 = 1 OR 2	S4Q8.  Where is that located?	S4Q8.  Ile iko wapi?	S4Q8.  Où cela se trouve-t-il?

Response Criteria	English	Swahili	French
ASK IF S4Q7 = 1 OR 2	S4Q9. Is it owned by a Congolese person or a foreigner? [SELECT ALL THAT APPLY]	S4Q9. Ni ya Mkongomani ao mgeni? [CHAGUA YOTE YANAYOTUMIKA]	S4Q9. Appartient-il à un Congolais ou à un étranger? [SÉLECTIONNEZ TOUT CE QUI S'APPLIQUE]
	1. CONGOLESE	1. MKONGOMANI	1. CONGOLAIS
	2. FOREIGNER	2. MGENI	2. ÉTRANGER
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S4Q9 = 2 (FOREIGNER)	S4Q10. What is the nationality of the owner? [SELECT ALL THAT APPLY]	S4Q10. Mwenye nayo ni wa taifa gani? [CHAGUA YOTE YANAYOTUMIKA]	S4Q10. Quelle est la nationalité du propriétaire? [SÉLECTIONNEZ TOUT CE QUI S'APPLIQUE]
	1. ANGOLAN	1. ANGOLAN	1. ANGOLAISE
	2. CHINESE	2. CHINOIS	2. CHINOIS
	3. ENGLISH	3. ANGLAIS	3. ANGLAIS
	4. GERMAN	4. ALLEMAND	4. ALLEMAND
	5. INDIAN	5. INDIEN	5. INDIEN
	6. LEBANESE	6. LIBANAIS	6. LIBANAIS
	7. SWISS	7. SWISSE	7. SUISSE
	8. ZAMBIAN	8. ZAMBIEN	8. ZAMBIEN
	9. TANZANIAN	9. TANZANIEN	9. TANZANIENNE
	10. USA	10. AMERICAIN	10. USA
	11. OTHER	11. YENGINE	11. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS

Response Criteria	English	Swahili	French
	99. REFUSED	99. ALIKATALA	99. REFUSÉ
ASK IF S4Q10 = 11 (OTHER)	S4Q10_OTHER. Please specify	S4Q10_YENGINE. Tafazali onyesha	S4Q10_AUTRE. Veuillez préciser
<b>SECTION 5: WORKING CONDITIONS</b>			
ASK ALL	S5Q1.  Do children under age 18 work at the mine site where you work?	S5Q1.  Je! watoto walio chini ya miaka 18 wanafanzaka kazi mu site minier yenye unatumikiaka amo?	S5Q1.  Des enfants de moins de 18 ans travaillent-ils sur le site minier où vous travaillez?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	S5Q2A.  We would like to know about any dangerous work or work in hazardous conditions you do or did. Does or did your work often involve exposure to...  ...excessive noise without appropriate protective equipment?	S5Q2A.  Tungependa kujua kama unafanyaka ao ulifanyaka kazi yoyote hatari ao katika mazingira hatari. Je, kazi yako mara nyingi ina exposaka ao ilikuwaka na exposa ku...  ...fujo mingi bila vifaa vya kinga vinavyofaa?	S5Q2A.  Nous aimerions savoir si vous faites ou avez fait un travail dangereux ou un travail dans des conditions dangereuses. Votre travail implique-t-il ou impliquait-il souvent une exposition à...  ...à un bruit excessif sans équipement de protection approprié?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK ALL	<p>S5Q2B.</p> <p>[READ IF NECESSARY: Does or did your work often involve exposure to..]</p> <p>...extreme heat without sufficient breaks or without access to clean water?</p>	<p>S5Q2B.</p> <p>[SOMA IKIWA NI LAZIMA: Je, ulifanya kazi yako mara nyingi ina exposaka ao ilikuwaka na exposar..]</p> <p>... Kifukutu ya makali bila mapumziko ya kutosha ao bila kupata maji safi?</p>	<p>S5Q2B.</p> <p>[LIRE SI NECESSAIRE : Votre travail implique-t-il ou impliquait-il souvent une exposition à...]</p> <p>...une chaleur extrême sans pauses suffisantes ou sans accès à de l'eau propre?</p>
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	<p>S5Q2C.</p> <p>[READ IF NECESSARY: Does or did your work often involve exposure to..]</p> <p>...dangerous chemicals without appropriate protective equipment?</p>	<p>S5Q2C.</p> <p>[SOMA IKIWA NI LAZIMA: Je, ulifanya kazi yako mara nyingi ina exposaka ao ilikuwaka na exposar ku....]</p> <p>... Produits chimiques za hatari bila vifaa vya kinga vinavyofaa?</p>	<p>S5Q2C.</p> <p>[LIRE SI NECESSAIRE : Votre travail implique-t-il ou impliquait-il souvent une exposition à...]</p> <p>...des produits chimiques dangereux sans équipement de protection approprié?</p>
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK ALL	<p>S5Q2D.</p> <p>[READ IF NECESSARY: Does or did your work often involve exposure to.. ]</p> <p>...dangerous or sharp tools or heavy machinery without appropriate protective equipment?</p>	<p>S5Q2D.</p> <p>[SOMA IKIWA NI LAZIMA: Je, ulifanya kazi yako mara nyingi ina exposaka ao ilikuwaka na exposar ku..]</p> <p>...zana hatari au zenye ncha kali au mashine nzito bila vifaa vya kinga vinavyofaa?</p>	<p>S5Q2D.</p> <p>[LIRE SI NECESSAIRE : Est-ce que votre travail implique ou impliquait souvent une exposition à...]</p> <p>...des outils dangereux ou tranchants ou des machines lourdes sans équipement de protection approprié ?</p>
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	<p>S5Q2E.</p> <p>[READ IF NECESSARY: Does or did your work often involve exposure to.. ]</p> <p>...carrying unreasonably heavy loads?</p>	<p>S5Q2E.</p> <p>[SOMA IKIWA NI LAZIMA: Je, ulifanya kazi yako mara nyingi ina exposaka ao ilikuwaka na exposar ku ...]</p> <p>... kubeba mizigo mizito isivyostahili?</p>	<p>S5Q2E.</p> <p>[LIRE SI NECESSAIRE : Votre travail implique-t-il ou a-t-il impliqué souvent une exposition à... ]</p> <p>...à porter des charges déraisonnablement lourdes?</p>
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK ALL	<p>S5Q2F.</p> <p>[READ IF NECESSARY: Does or did your work often involve exposure to..]</p> <p>...dust or strong fumes without appropriate protective equipment?</p>	<p>S5Q2F.</p> <p>[SOMA IKIWA NI LAZIMA: Je, ulifanya kazi yako mara nyingi ina exposaka ao ilikuwaka na exposar ku ....]</p> <p>...vumbi ao moshi makali bila vifaa vya kinga vinavyofaa?</p>	<p>S5Q2F.</p> <p>[LIRE SI NECESSAIRE : Est-ce que votre travail implique ou impliquait souvent une exposition à... ]</p> <p>...des poussières ou des fumées fortes sans équipement de protection approprié?</p>
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK ALL	<p>S5Q2G.</p> <p>[READ IF NECESSARY: Does or did your work often involve exposure to..]</p> <p>...insecure tunnels?</p>	<p>S5Q2G.</p> <p>[SOMA IKIWA NI LAZIMA:Je, ulifanya kazi yako mara nyingi ina exposaka ao ilikuwaka na exposar ku ...]</p> <p>...ma tunnels zenye hazina securite?</p>	<p>S5Q2G.</p> <p>[LIRE SI NECESSAIRE : Votre travail implique-t-il ou a-t-il impliqué souvent une exposition à... ]</p> <p>...des tunnels non sécurisés?</p>
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. REFUSÉ

Response Criteria	English	Swahili	French
ASK ALL	S5Q2H.  [READ IF NECESSARY: Does or did your work often involve exposure to.. ]  ...anything else you consider dangerous?	S5Q2H.  [SOMA IKIWA NI LAZIMA: Je, ulifanya kazi yako mara nyingi ina exposaka ao ilikuwaka na exposa ku ...]  ... kitu kingine chochote unachokiona kuwa hatari?	S5Q2H.  [LIRE SI NECESSAIRE : Votre travail implique-t-il ou a-t-il impliqué souvent une exposition à... ]  ...toute autre chose que vous considérez comme dangereuse?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q2H = 1	S5Q2H_OTHER.  What other dangerous work do or did you do?	S5Q2H_YENGINE.  Ni kazi gani yengine ya hatari unafanyaka ao ulikuwa na fanya?	S5Q2H_AUTRE.  Quel autre travail dangereux faites-vous ou avez-vous fait?
ASK IF SIQ12 = 1 (EMPLOYER) AND YES TO ANY QUESTION S5Q2A THROUGH S5Q2H	S5Q3.  Could you have refused to do these hazardous activities?	S5Q3.  Je, ungeweza kukatala kufanya shughuli hizi za hatari?	S5Q3.  Auriez-vous pu refuser de faire ces activités dangereuses?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK IF S5Q3 = 2 (NO)	S5Q4. What might happen if you refused?  [INTERVIEWER: LISTEN AND SELECT ALL THAT APPLY]	S5Q4. Nini inaweza kutokea kama unakatala?  [MUHOJI: SIKILIZA NA UCHAGUE YOTE YANAYOTUMIKA]	S5Q4. Que pourrait-il se passer si vous refusiez?  [ENQUÊTEUR : ÉCOUTEZ ET SÉLECTIONNEZ TOUT CE QUI S'APPLIQUE]
	1. WITHHOLDING OF WAGES OR OTHER PROMISED BENEFITS	1. KUZUIA MSHAHARA AO MA AVANTAGES ZENGINE ILIYOAHIDIWA	1. RETENUE DE SALAIRE OU D'AUTRES AVANTAGES PROMIS
	2. DENIAL OF RIGHTS OR PRIVILEGES	2. KUMUJIMA HAKI AO UPENDELEO	2. REFUS DE DROITS OU DE PRIVILÈGES
	3. FINE OR DEDUCTION FROM WAGES	3. AMENDE AO AU KUPUNGUZWA KWA MSHAHARA	3. AMENDE OU RETENUE SUR LE SALAIRE
	4. THREATS OR VIOLENCE AGAINST RESPONDENT OR RESPONDENT'S FAMILY	4. VITISHO AO VIOLENCE CONTRE MWENYE KUJIBU AO FAMILIA YAKE MHOJIWA.	4. MENACES OU VIOLENCE CONTRE LE DÉFENDEUR OU SA FAMILLE
	5. DISMISSAL OR THREATS OF DISMISSAL	5. KUFUKUZWA AO VITISHO(MENACE) VYA KUFUKUZWA MU KAZI	5. LICENCIEMENT OU MENACES DE LICENCIEMENT
	6. WITHHOLDING OF VALUABLE DOCUMENTS (SUCH AS IDENTITY DOCUMENTS, SCHOOL CERTIFICATES, OR RESIDENCE PERMITS)	6. KUZUIWA KU MA DOCUMENTS ZA VALEUR (KAMA DOCUMENTS ZA VITAMBULISHO, DOCUMENTS ZA SHULE, AO VIBALI VYA MAKAZI)	6. RÉTENTION DE DOCUMENTS DE VALEUR (TELS QUE DES DOCUMENTS D'IDENTITÉ, DES CERTIFICATS SCOLAIRES OU DES PERMIS DE RESIDENCE)
	7. OTHER	7. YENGINE	7. AUTRE
	8. NOTHING	8. HAKUNA	8. RIEN
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ



Response Criteria	English	Swahili	French
ASK IF S5Q4 = 2	S5Q4_OTHER_RP.  Which rights or privileges would be denied?	S5Q4_YENGINE_RP.  Haki ao marupurupu hayangepewa?	S5Q4_AUTRE_RP.  Quels droits ou privilèges vous seraient refusés?
ASK IF S5Q4 = 7 (OTHER)	S5Q4_OTHER.  RECORD OTHER	S5Q4_YENGINE.  ANDIKA AYO KWA NAMNA YENGINE	S5Q4_AUTRE.  ENREGISTRER AUTREMENT
ASK ALL	S5Q5.  Do (did) you usually wear any protective gear while working in this job?	S5Q5.  Unavalaka (ulikuwa na vala) kila mara kifaa cha kujikinga unapofanya kazi hii?	S5Q5.  Portez-vous (portiez-vous) habituellement un équipement de protection lorsque vous faites ce travail?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q5 = 1 (YES)	S5Q6.  What do (did) you wear?	S5Q6.  Unavalaka (ulikuwa na vala) nini?	S5Q6.  Que portez-vous (portiez-vous)?
	1. PROTECTIVE GOGGLES	1. MIKUKU YA KINGA/LUNETTES DE PROTECTION	1. DES LUNETTES DE PROTECTION
	2. HELMET	2. CASQUE	2. CASQUE
	3. EAR-PLUGS	3. VIBAO-MASIKIO/PROTECTIONS AUDITIVES	3. PROTECTIONS AUDITIVES
	4. FACE SHIELD	4. NGAO YA USO/PROTECTION YA SURA	4. ÉCRAN FACIAL

Response Criteria	English	Swahili	French
	5. RESPIRATOR OR DUST MASK	5. KINYAMA CHA KUPUMILIA ILI KUJIKINGA VUMBI/MASQUE ANTI-POUSSIERE	5. MASQUE RESPIRATOIRE OU MASQUE ANTI-POUSSIERE
	6. PROTECTIVE CLOTHING (EX: LEATHER, ASBESTOS)	6. MAVAZI YA KULINDA (Mfano.: NGOZI, ASBESTOS/AMIANTE)	6. VÊTEMENTS DE PROTECTION (EX : CUIR, AMIANTE)
	7. GLOVES	7. GANTS	7. GANTS
	8. SHOES	8. VIATU	8. CHAUSSURES
	9. OTHER	9. YENGINE	9. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q6 = 9 (OTHER)	S5Q6_OTHER. RECORD OTHER	S5Q6_YENGINE. ANDIKA KWA NAMNA YENGINE	S5Q6_AUTRE. ENREGISTRER AUTREMENT
ASK ALL	S5Q7.  Is there protective equipment that you don't have that would make you feel safer?	S5Q7.  Je, kuna vifaa vya kujikinga ambavyo hauna na ambavyo vinaweza kukufanya ujisikie salama zaidi?	S5Q7.  Y a-t-il un équipement de protection que vous n'avez pas et qui vous permettrait de vous sentir plus en sécurité?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK IF S5Q7 = 1 (YES)	S5Q7A. What kind of protective equipment would make you feel safer?  [SELECT ALL THAT APPLY]	S5Q7A. Ni aina gani ya vifaa vya kinga ambavyo vinaweza kukufanya ujisikie salama zaidi?  [CHAGUA YOTE YANAYOTUMIKA]	S5Q7A. Quel type d'équipement de protection vous permettrait de vous sentir plus en sécurité ?  [SÉLECTIONNEZ TOUT CE QUI S'Y RAPPORTE]
	1. PROTECTIVE GOGGLES	1. MIKUKU YA KINGA/LUNETTES DE PROTECTION	1. DES LUNETTES DE PROTECTION
	2. HELMET	2. CASQUE	2. CASQUE
	3. EAR-PLUGS	3. VIBAO-MASIKIO/PROTECTIONS AUDITIVES	3. PROTECTIONS AUDITIVES
	4. FACE SHIELD	4. NGAO YA USO/PROTECTION YA SURA	4. ÉCRAN FACIAL
	5. RESPIRATOR OR DUST MASK	5. KINYAMA CHA KUPUMILIA ILI KUJIKINGA VUMBI/MASQUE ANTI-POUSSIÈRE	5. MASQUE RESPIRATOIRE OU MASQUE ANTI-POUSSIÈRE
	6. PROTECTIVE CLOTHING (EX: LEATHER, ASBESTOS)	6. MAVAZI YA KULINDA (Mfano.: NGOZI, ASBESTOS/AMIANTE)	6. VÊTEMENTS DE PROTECTION (EX : CUIR, AMIANTE)
	7. GLOVES	7. GANTS	7. GANTS
	8. SHOES	8. VIATU	8. CHAUSSURES
	9. OTHER	9. YENGINE	9. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q7A = 9 (OTHER)	RECORD OTHER	ANDIKA KWA NAMNA YENGINE	ENREGISTRER AUTREMENT

Response Criteria	English	Swahili	French
ASK ALL	S5Q8. Have you ever gotten hurt or sick because of your work in this job?	S5Q8. Je, umewahi kulumia ao kugonjwa kwa sababu ya kazi yako katika kazi hii?	S5Q8. Avez-vous déjà été blessé ou malade à cause de votre travail dans cet emploi?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q8 = 1 (YES)	S5Q9. What types of injury or sickness have you had?  INTERVIEWER: SELECT ALL THAT APPLY	S5Q9. Je, ulipata majeraha/blessures ao magonjwa ya aina gani?  MHOJI: CHAGUA YOTE YANAYOTUMIKA	S5Q9. Quels types de blessures ou de maladies avez-vous eus?  ENQUÊTEUR : SÉLECTIONNEZ TOUT CE QUI S'APPLIQUE
	1. HEAD INJURY	1. KUJERUHIWA/BLESSURES ZA KICHWA	1. BLESSURE DE LA TÊTE
	2. INJURY TO OR DEAFNESS IN EARS	2. KUJERUHIWA/BLESSURES KWA AO MASIKIO KUTOSIKIA	2. BLESSURE OU SURDITÉ DES OREILLES
	3. EYE INJURY	3. KUJERUHIWA/BLESSURES YA MACHO	3. LÉSIONS AUX YEUX
	4. INJURY TO SHOULDER	4. BLESSURES KU MABEGA	4. BLESSURE À L'ÉPAULE
	5. INJURY TO OR SWELLING IN HANDS	5. KUJERUHI AO MIKONO KUVIMBA	5. BLESSURE OU GONFLEMENT DES MAINS
	6. SMOKE, DUST, OR CHEMICAL DAMAGE TO LUNGS	6. MOSHI, VUMBI, AO UHARIBIFU ZA MA PRODUITS CHIMIQUES KU POUMONS	6. FUMÉE, POUSSIÈRE, OU DOMMAGES CHIMIQUES AUX POUMONS ?
	7. INJURY TO ABDOMEN	7. BLESSURE KU TUMBU	7. BLESSURE À L'ABDOMEN

Response Criteria	English	Swahili	French
	8. BACK STRAIN/ PAIN IN BACK	8. MAUMIVU YA MGONGO	8. DOULEUR DANS LE DOS ?
	9. INJURY TO KNEES OR LEGS	9. BLESSURE KU MAGOTI AO MIGULU	9. BLESSURE AUX GENOUX OU AUX JAMBES ?
	10. TWISTED ANKLE	10. CHEVILLE INAGONJWA	10. CHEVILLE TORDUE ?
	11. INJURY TO FEET	11. KULUMIA KU MIGULU	11. BLESSURE AUX PIEDS
	12. HEAT STROKE	12. KUPIGWA NA KIFUKUTU	12. COUP DE CHALEUR
	13. BURN FROM FIRE	13. KULUNGULA NA MOTO	13. BRÛLURE PAR LE FEU
	14. CHEMICAL BURN	14. KULUNGULA NA MA PRODUITS CHIMIQUES	14. BRÛLURE CHIMIQUE
	15. CUTS/WOUNDS	15. KUKATIKA/VIDONDA	15. COUPURES/PLAIES
	16. OTHER	16. YENGINE	16. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q9 = 13* <i>*NOTE: PROGRAMMING ERROR, SHOULD HAVE BEEN 16</i>	S5Q9_OTHER. RECORD OTHER	S5Q9_YENGINE. ANDIKA KWA NAMNA YENGINE	S5Q9 _AUTRE. ENREGISTRER AUTREMENT
ASK IF S5Q8 = 1 (YES)	S5Q10. How did you get hurt or sick? INTERVIEWER: SELECT ALL THAT APPLY	S5Q10. Ulijilumiza aye ao uligonjwa aye? MHOJI/ENQUETE: CHAGUA YOTE YANAYOTUMIKA	S5Q10. Comment vous êtes-vous blessé ou rendu malade? ENQUETEUR : SÉLECTIONNEZ TOUT CE QUI S'APPLIQUE
	1. FALLING ROCK	1. KUANGUKA KWA MWAMBA AO JIWE	1. CHUTE DE PIERRE
	2. TOOL ACCIDENT	2. AJALI YA KIFAA	2. ACCIDENT D'OUTIL

Response Criteria	English	Swahili	French
	3. MACHINERY ACCIDENT	3. AJALI YA MASHINE	3. ACCIDENT DE MACHINE
	4. INSUFFICIENT VENTILATION	4. HEWA ISIYO TOSHA /VENTILATION INSUFFISANTE	4. VENTILATION INSUFFISANTE
	5. VIOLENCE BY COWORKER/EMPLOYER	5. VIOLENCE NA MFANYAKAZI MWENZANGU/ BOSI	5. VIOLENCE PAR UN COLLÈGUE/EMPLOYEUR
	6. OTHER	6. YENGINE	6. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q10 = 6 (OTHER)	S5Q10_OTHER. RECORD OTHER	S5Q10_YENGINE. ANDIKA KWA NAMNA YENGINE	S5Q10_AUTRE. ENREGISTRER AUTREMENT
ASK IF S5Q8 = 1 (YES)	S5Q11. Did you receive any medical care for your most recent injury or illness?	S5Q11. Je, ulipokea huduma yoyote ya afya ku kutunza blessure yako ao ugonjwa wako wa juzi juzi?	S5Q11. Avez-vous reçu des soins médicaux pour votre blessure ou maladie la plus récente?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q11 = 1 (YES)	S5Q12. Who paid for your medical care for this injury or illness, including any transportation?  INTERVIEWER: SELECT ALL THAT APPLY	S5Q12. Nani alikulipia matibabu kwa blessure hili aou ugonjwa, pamoja na usafiri wowote?  MHOJI/ENQUETEUR: CHAGUA YOTE YANAYOTUMIKA	S5Q12. Qui a payé vos soins médicaux pour cette blessure ou cette maladie, y compris le transport?  ENQUETEUR : SÉLECTIONNEZ TOUT CE QUI S'APPLIQUE

Response Criteria	English	Swahili	French
	1. THERE WAS NO COST	1. HAKUNA GHARAMA/PAS DE FRAIS	1. IL N'Y A PAS EU DE FRAIS
	2. SELF	2. MTU YE PEKE AO YEYE MWENYEWE	2. MOI-MÊME
	3. EMPLOYER	3. MWAJIRI/BOSI	3. EMPLOYEUR
	4. COOPERATIVE	4. USHIRIKIANO/COOPERATIVE	4. COOPERATIVE
	5. FRIENDS OR FAMILY	5. MARAFIKI AO FAMILIA	5. AMIS OU FAMILLE
	6. COLLEAGUE	6. MWENZAKE WA KAZI	6. COLLEAGUE
	7. OTHER	7. MWENGINE	7. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q12 = 7 (OTHER)	S5Q12_OTHER. RECORD OTHER	S5Q12_YENGINE. ANDIKA KWA NAMNA YENGINE	S5Q12_AUTRE. ENREGISTRER AUTREMENT
ASK IF S5Q11 = 1 (YES)	S5Q13. Was the medical care you received enough to make you better?	S5Q13. Je, matibabu uliyopokea yalitoshwa kukufanya uwe bora zaidi?	S5Q13. Les soins médicaux que vous avez reçus étaient-ils suffisants pour que vous alliez mieux?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK IF S1Q12 = 1 (EMPLOYER)	S5.Q14. Does your employer require you to work for other employers without your agreement?	S5.Q14. Je, bosi wako anakuhitaji ufanye kazi kwa wabosi wengine bila makubaliano yako?	S5.Q14. Votre employeur vous oblige-t-il à travailler pour d'autres employeurs sans votre accord?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q14 = 1 (YES)	S5.Q15. What might happen if you refused?	S5.Q15. Nini inaweza kutokea ikiwa utakatala?	S5.Q15. Que pourrait-il se passer si vous refusez?
	1. WITHHOLDING OF WAGES OR OTHER PROMISED BENEFITS	1. KUZUIA MSHAHARA AO MA AVANTAGES ZENGINA ILIYOAHIDIWA	1. RETENUE DU SALAIRE OU D'AUTRES AVANTAGES PROMIS
	2. DENIAL OF RIGHTS OR PRIVILEGES	2. KUMUJIMA HAKI AO UPENDELEO	2. REFUS DE DROITS OU DE PRIVILÈGES
	3. FINE OR DEDUCTION FROM WAGES	3. AMENDE AO AU KUPUNGUZIWA KWA MSHAHARA	3. AMENDE OU RETENUE SUR LE SALAIRE
	4. THREATS OR VIOLENCE AGAINST RESPONDENT OR RESPONDENT'S FAMILY	4. VITISHO AO VIOLENCE CONTRE MWENYE KUJIBU AO FAMILIA YAKE MHOJIWA.	4. MENACES OU VIOLENCE CONTRE LE DÉFENDEUR OU SA FAMILLE
	5. DISMISSAL OR THREATS OF DISMISSAL	5. KUFUKUZWA AO VITISHO(MENACE) VYA KUFUKUZWA MU KAZI	5. LICENCIEMENT OU MENACES DE LICENCIEMENT



Response Criteria	English	Swahili	French
	6. WITHHOLDING OF VALUABLE DOCUMENTS (SUCH AS IDENTITY DOCUMENTS, SCHOOL CERTIFICATES, OR RESIDENCE PERMITS)	6. KUZUIWA KU MA DOCUMENTS ZA VALEUR (KAMA DOCUMENTS ZA VITAMBULISHO, DOCUMENTS ZA SHULE, AO VIBALI VYA MAKAZI)	6. RÉTENTION DE DOCUMENTS DE VALEUR (TELS QUE DES DOCUMENTS D'IDENTITÉ, DES CERTIFICATS SCOLAIRES OU DES PERMIS DE RESIDENCE/SÉJOUR)
	7. OTHER	7. YENGINE	7. AUTRE
	8. NOTHING	8. HAKUNA	8. RIEN
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q15 = 2	S5Q15_OTHER_RP. Which rights or privileges would be denied?	S5Q15_YENGINE_RP. Haki ao marupurupu hayangepewa?	S5Q15_AUTRE_RP. Quels droits ou privilèges vous seraient refusés?
ASK IF S5Q15 = 7 (OTHER)	S5Q15_OTHER. Please specify	S5Q15_YENGINE. Tafazali onyesha	S5Q15_AUTRE. Veuillez préciser
ASK IF SIQ12 = 1 (EMPLOYE R)	S5Q16. Do (did) you ever work overtime?	S5Q16. Unafanya ao ulishawahi fanya kazi ya ziada/heures supplémentaires?	S5Q16. Avez-vous (avez-vous) déjà fait des heures supplémentaires?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q16 = 1 (YES)	S5Q17. Is overtime always voluntary?	S5Q17. Esk saa za ziada ni za hiari kila wakati?	S5Q17. Les heures supplémentaires sont-elles toujours volontaires?
	1. YES	1. NDIYO	1. OUI

Response Criteria	English	Swahili	French
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q16 = 1 (YES)	S5Q18. Do you consider the overtime requirements abusive?	S5Q18. Je, unaona mahitaji ya saa za ziada kuwa ya unyanyasaji?	S5Q18. Considérez-vous que les exigences en matière d'heures supplémentaires sont abusives?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. HAPANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q16 = 1 (YES)	S5Q19. What might happen if you refused to work overtime?	S5Q19. Ni nini kinachoweza kutokea ikiwa utakatalaa kutumika ma saa za ziada?	S5Q19. Que pourrait-il se passer si vous refusiez de faire des heures supplémentaires?
	1. WITHHOLDING OF WAGES OR OTHER PROMISED BENEFITS	1. KUZUIA MSHAHARA AO MA AVANTAGES ZENGINE ILIYOAHIDIWA	1. RETENUE DU SALAIRE OU D'AUTRES AVANTAGES PROMIS
	2. DENIAL OF RIGHTS OR PRIVILEGES	2. KUMUJIMA HAKI AO UPENDELEO	2. REFUS DE DROITS OU DE PRIVILÈGES
	3. FINE OR DEDUCTION FROM WAGES	3. AMENDE AO AU KUPUNGUZWA KWA MSHAHARA	3. AMENDE OU RETENUE SUR LE SALAIRE
	4. THREATS OR VIOLENCE AGAINST RESPONDENT OR RESPONDENT'S FAMILY	4. VITISHO AO VIOLENCE CONTRE MWENYE KUJIBU AO FAMILIA YAKE MHOJIWA.	4. MENACES OU VIOLENCE CONTRE LE DÉFENDEUR OU SA FAMILLE
	5. DISMISSAL OR THREATS OF DISMISSAL	5. KUFUKUZWA AO VITISHO(MENACE) VYA KUFUKUZWA MU KAZI	5. LICENCIEMENT OU MENACES DE LICENCIEMENT

Response Criteria	English	Swahili	French
	6. WITHHOLDING OF VALUABLE DOCUMENTS (SUCH AS IDENTITY DOCUMENTS, SCHOOL CERTIFICATES, OR RESIDENCE PERMITS)	6. KUZUIWA KU MA DOCUMENTS ZA VALEUR (KAMA DOCUMENTS ZA VITAMBULISHO, DOCUMENTS ZA SHULE, AO VIBALI VYA MAKAZI)	6. RÉTENTION DE DOCUMENTS DE VALEUR (TELS QUE DES DOCUMENTS D'IDENTITÉ, DES CERTIFICATS SCOLAIRES OU DES PERMIS DE RESIDENCE/SÉJOUR)
	7. OTHER	7. YENGINE	7. AUTRE
	8. NOTHING	8. HAKUNA	8. RIEN
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q19 = 2	S5Q19_OTHER_RP. Which rights or privileges would be denied?	S5Q19_YENGINE_RP. Haki ao marupurupu hayangepewa?	S5Q19_AUTRE_RP. Quels droits ou privilèges vous seraient refusés?
ASK IF S5Q19 = 7 (OTHER)	S5Q19_OTHER. RECORD OTHER	S5Q19_YENGINE. ANDIKA AYO KWA NAMNA YENGINE	S5Q19_AUTRE. ENREGISTRER AUTREMENT
ASK ALL	S5Q20. What time do you usually start work each day?  ROUND TO CLOSEST HOUR.	S5Q20. Kwa kawaida unaanzaka kazi saa ngapi kila siku?  ZUNGUSHA HADI SAA YA KUFUNGA./ARRONDIR À L'HEURE LA PLUS PROCHE.	S5Q20. A quelle heure commencez-vous habituellement à travailler chaque jour?  ARRONDIR À L'HEURE LA PLUS PROCHE.
	TIME	TIME	TIME
ASK ALL	S5Q21. What time do you usually stop work each day?  ROUND TO CLOSEST HOUR.	S5Q21. Huwa unaacha kazi saa ngapi kila siku?  ZUNGUSHA HADI SAA YA KUFUNGA. ARRONDIR À L'HEURE LA PLUS PROCHE.	S5Q21. A quelle heure arrêtez-vous habituellement le travail chaque jour?  ARRONDIR À L'HEURE LA PLUS PROCHE.

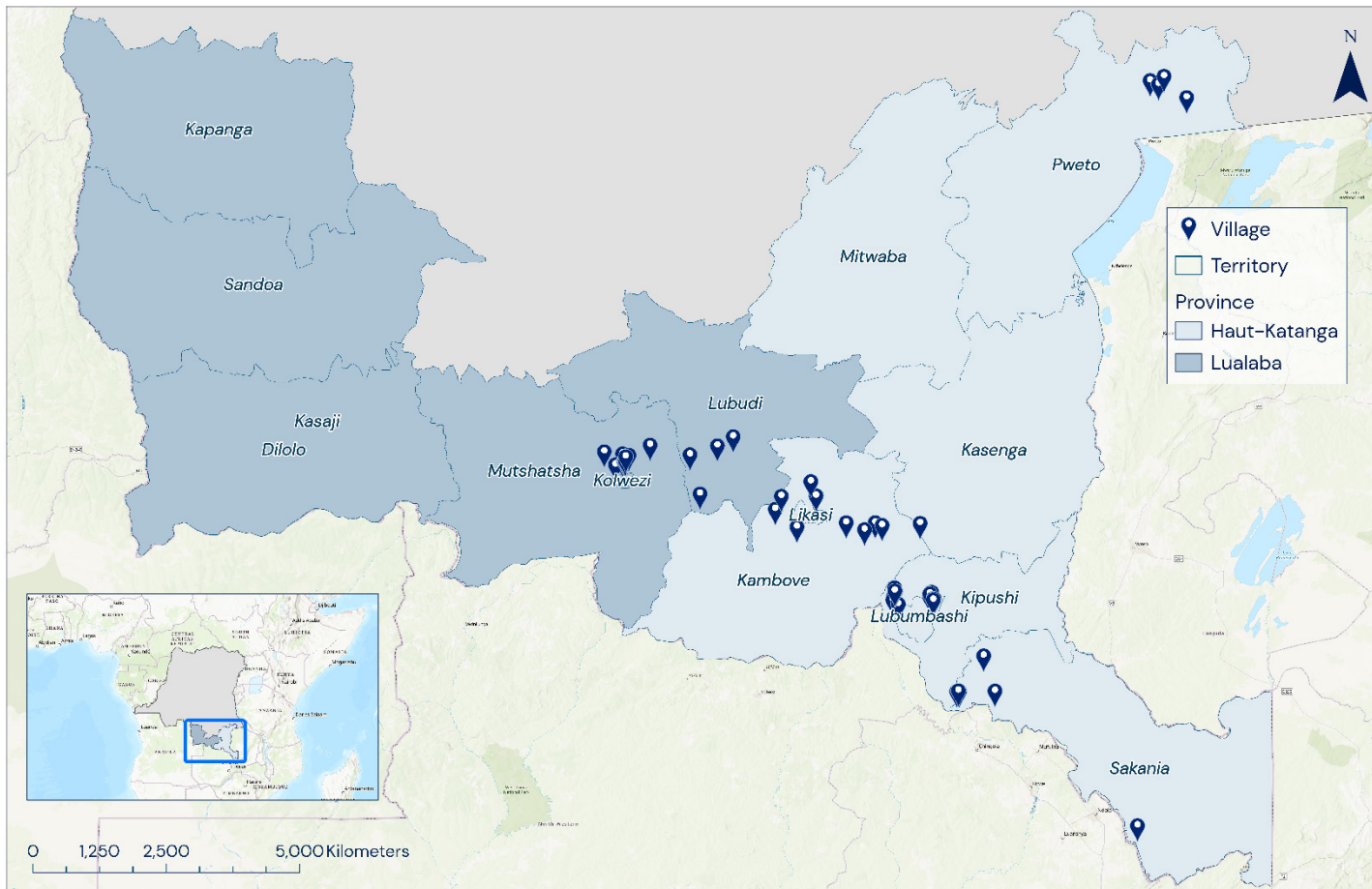
Response Criteria	English	Swahili	French
	TIME	TIME	TIME
ASK ALL	S5Q22. How many days do (did) you usually work each week?	S5Q22. Unatumikaka siku ngapi mu/kwa juma?	S5Q22. Combien de jours travaillez-vous (travaillez-vous) habituellement par semaine?
	1 DAY	SIKU 1	1 JOUR
	2 DAYS	SIKU 2	2 JOURS
	3 DAYS	SIKU 3	3 JOURS
	4 DAYS	SIKU 4	4 JOURS
	5 DAYS	SIKU 5	5 JOURS
	6 DAYS	SIKU 6	6 JOURS
	7 DAYS	SIKU 7	7 JOURS
	77. DON'T KNOW	77. HAJUE	NE SAIT PAS
	99. REFUSED	99. ALIKATALA	A REFUSÉ
ASK IF SIQ12 = 1 (EMPLOYER)	S5Q23. If you decide (decided) to stop working with this employer, can (could) you leave without negative consequences by your employer?	S5Q23. Kama unamua (uliamua) kuacha kutumikia bosi huyu, je (unaweza) kuondoka bila matokeo mabaya kutoka kwa bosi wako?	S5Q23. Si vous décidez (avez décidé) d'arrêter de travailler avec cet employeur, pouvez-vous (pourriez-vous) partir sans conséquences négatives de la part de votre employeur?
	1. YES	1. NDIYO	1. OUI
	2. NO	2. APANA	2. NON
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ

Response Criteria	English	Swahili	French
ASK IF S5Q23 = 2 (NO)	<p>S5Q24.</p> <p>Can you tell me in your own words how the employer or recruiter keeps (kept) you from quitting your job?</p> <p>[LISTEN, THEN SAY: Anything else?]</p> <p>SELECT ALL THAT APPLY.</p>	<p>S5Q24.</p> <p>Unaweza kuniambia kwa maneno yako mwenyewe jinsi boshi ao mwajiri/recruteur anakuzuia (alikuzaia) usiache kazi yako?</p> <p>[SIKILIZA, KISHA SEMA: Kitu kingine chochote?]</p> <p>CHAGUA ZOTE ZINAZOTUMIKA.</p>	<p>S5Q24.</p> <p>Pouvez-vous me dire dans vos propres mots comment l'employeur ou le recruteur vous empêche (a empêché) de quitter votre emploi?</p> <p>[ÉCOUTEZ, PUIS DITES : Autre chose?]</p> <p>SÉLECTIONNEZ TOUTES LES RÉPONSES QUI S'APPLIQUENT.</p>
	1. VIOLENCE AGAINST RESPONDENT	1. VIOLENCE CONTRE MWENYE KUJIBU	1. VIOLENCE À L'ENCONTRE DE L'ENQUÊTÉ
	2. THREATS OF VIOLENCE AGAINST RESPONDENT	2. VITISHO VYA UKATILI/MENACE CONTRE MWENYE KUJIBU	2. MENACES DE VIOLENCE À L'ENCONTRE DE L'ENQUÊTÉ
	3. THREATS OR VIOLENCE AGAINST RESPONDENT'S FAMILY, RELATIVES, OR CLOSE ASSOCIATES	3. VITISHO AO MENACES CONTRE FAMILIA, WAZAZI AO WATU WA KARIBU WA MWENYE KUJIBU.	3. MENACES OU VIOLENCES À L'ENCONTRE DE LA FAMILLE, DES PARENTS OU DES PROCHES DE LA PERSONNE MISE EN CAUSE.
	4. RESTRICTIONS ON RESPONDENT'S MOVEMENT	4. VIZUIZI VYA MA DEPLACEMENTS ZA MWENYE KUJIBU	4. RESTRICTIONS SUR LES DÉPLACEMENTS DE LA PERSONNE INTERROGÉE
	5. DEBT BONDAGE OR MANIPULATION OF DEBT	5. USHINDI WA DENI AO MANIPULATION YA DETTES	5. SERVITUDE POUR DETTES OU MANIPULATION DE DETTES
	6. WITHHOLDING OF WAGES OR OTHER PROMISED BENEFITS	6. KUZUIA MSHAHARA AO MA AVANTAGES ZENGINE ILIYOAHIDIWA	6. RETENUE DE SALAIRE OU D'AUTRES AVANTAGES PROMIS

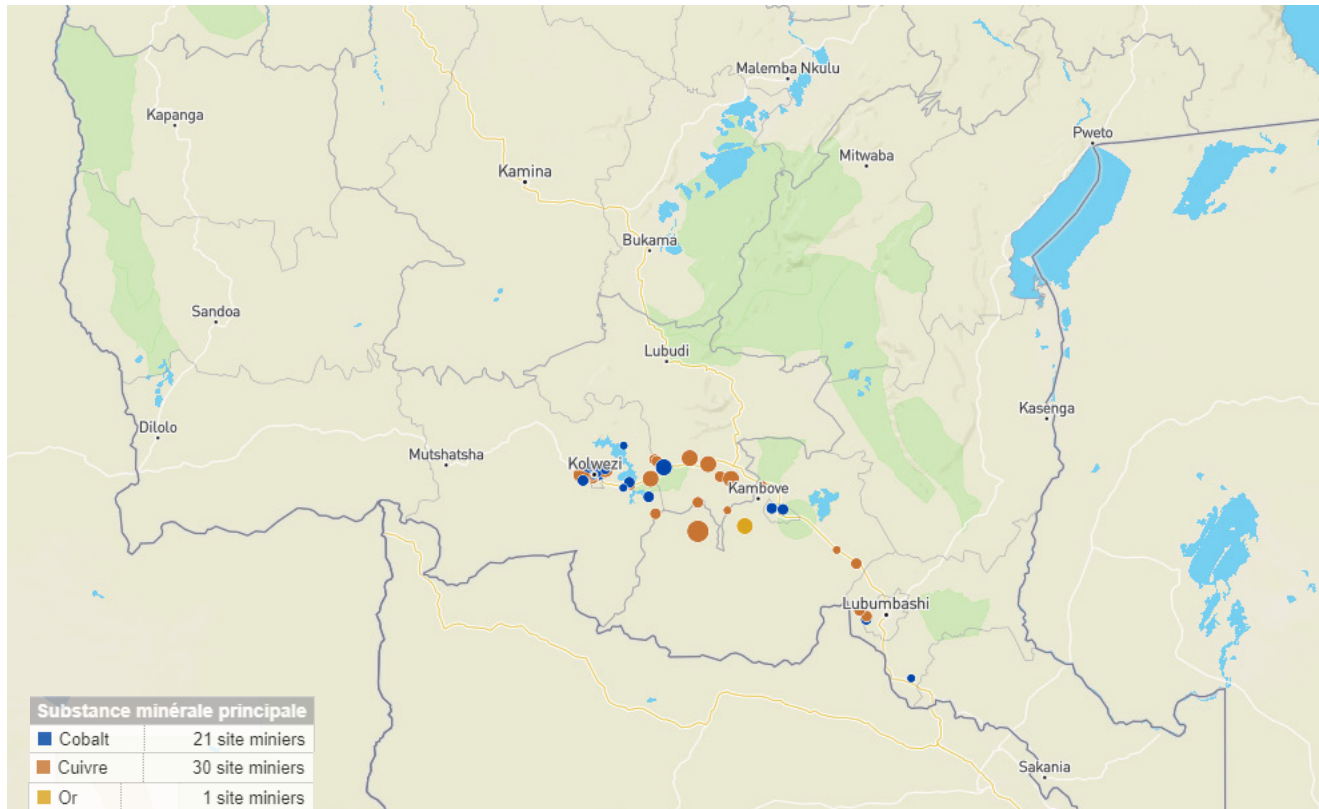
Response Criteria	English	Swahili	French
	7. WITHHOLDING OF VALUABLE DOCUMENTS (SUCH AS IDENTITY DOCUMENTS, SCHOOL CERTIFICATES, OR RESIDENCE PERMITS)	7. KUZUIWA KU MA DOCUMENTS ZA VALEUR (KAMA DOCUMENTS ZA VITAMBULISHO, DOCUMENTS ZA SHULE, AO VIBALI VYA MAKAZI)	7. LA RÉTENTION DE DOCUMENTS DE VALEUR (TELS QUE LES DOCUMENTS D'IDENTITÉ, LES CERTIFICATS DE SCOLARITÉ OU LES PERMIS DE RESIDENCE/ SÉJOUR).
	8. DENIAL OF RIGHTS OR PRIVILEGES	8. KUKATALA KUPANA HAKI AO MARUPURUPU	8. LE REFUS D'ACCORDER DES DROITS OU DES PRIVILÈGES
	9. NO COERCION ("NEEDED JOB, COULDN'T QUIT")	9. HAKUNA SHURUTISHI/COERCITION ("NILIKUWA NA HITAJI YA KAZI, SINGEWEZA KUACHA")	9. PAS DE COERCITION ("J'AVAIS BESOIN D'UN EMPLOI, JE NE POUVAIS PAS DÉMISSIONNER")
	10. OTHER	10. YENGINE	10. AUTRE
	77. DON'T KNOW	77. HAJUE	77. NE SAIT PAS
	99. REFUSED	99. ALIKATALA	99. A REFUSÉ
ASK IF S5Q24 = 8	S5Q24_OTHER_RP. Which rights or privileges would be denied?	S5Q24_YENGINE. Haki ao marupurupu hayakunipewa?	S5Q24_AUTRE. Quels droits ou privilèges vous seraient refusés?
ASK IF S5Q24 = 10 (OTHER)	S5Q24_OTHER. RECORD OTHER	S5Q24_YENGINE. ANDIKA KWA NAMNA YENGINE	S5Q24_AUTRE. ENREGISTRER AUTREMENT
ASK ALL	END INTERVIEW Thank you very much for sharing your experience.	MALIZA ENQUETE Asante sana kwa kushiriki na uzoefu/experience yako.	FIN DE L'ENTRETIEN Merci beaucoup d'avoir partagé votre expérience.

## APPENDIX C: MAPS

Figure C-I. Map of sampled villages



**Figure C-2. Map of artisanal mine sites that produce cobalt**



Note: The colors indicate the primary mineral at each site. Cobalt is blue, copper is orange, and gold is yellow.

Source: [https://www.ipisresearch.be/mapping/webmapping/drcongol/v6/#-](https://www.ipisresearch.be/mapping/webmapping/drcongol/v6/#-10.528371106024537126.94870964130632316.24293905965923914112.4ktatc)

[10.528371106024537126.94870964130632316.24293905965923914112.4ktatc](https://www.ipisresearch.be/mapping/webmapping/drcongol/v6/#-10.528371106024537126.94870964130632316.24293905965923914112.4ktatc)



## APPENDIX D: ADDITIONAL TABLES

Table D-I. Correlation table between primary forced labor indicators and age, education, and province of work

	Diffnature <sup>1</sup>		Invabusvertime <sup>2</sup>		Invhaz <sup>3</sup>		Noquit <sup>4</sup>		all_debtbond <sup>5</sup>		all_withholdwage <sup>6</sup>		all_abusevuln <sup>7</sup>	
	% (SE)	p-value	% (SE)	p-value	% (SE)	p-value	% (SE)	p-value	% (SE)	p-value	% (SE)	p-value	% (SE)	p-value
<b>Total</b>	24.8% (4.2)		35.6% (3.8)		43.9% (4.6)		12.5% (3.2)		9.3% (2.1)		28.2% (2.3)		59.7% (4.6)	
<b>Age</b>		0.01**		0.19		0.01**		<.0001**		0.73		0.15		0.33
18–24	41.6% (10.0)		47.1% (5.6)		56.7% (6.3)		11.8% (5.4)		7.1% (6.0)		37.4% (4.6)		55.1% (5.4)	
25–39	19.3% (4.3)		31.5% (6.3)		38.7% (3.4)		10.7% (1.6)		8.4% (2.7)		26.8% (4.7)		65.1% (5.1)	
40–54	15.7% (6.7)		33.9% (9.6)		36.8 (9.4)		7.4% (2.9)		13.2% (3.2)		19.9% (4.7)		54.5% (10.0)	
55+	21.0% (5.6)		23.9% (6.6)		47.3% (8.6)		38.9% (13.1)		13.9% (4.2)		24.8% (8.3)		54.8% (9.3)	
<b>Education</b>		0.29		0.28		0.29		0.75		0.92		0.07		0.29
Preschool to some secondary	27.7% (4.4)		29.1% (4.8)		38.8% (4.9)		13.4% (5.1)		9.5% (3.0)		22.7% (3.9)		63.6% (4.8)	
Completed secondary or higher	22.3% (5.2)		41.2% (8.4)		48.7% (7.8)		11.7% (3.2)		9.2% (2.4)		33.2% (3.4)		56.2% (6.6)	
<b>Province of work</b>		0.11		0.08		.		0.34		0.22		0.045**		0.001**
Haut-Katanga	28.1% (3.3)		38.6% (4.1)		49.9% (2.8)		14.1% (5.0)		1084% (3.4)		30.3% (3.3)		65.0% (2.9)	
Lualaba	17.7% (6.9)		29.2% (5.3)		30.9% (5.4)		8.9% (1.6)		6.2% (1.3)		23.9% (1.2)		48.4% (8.1)	

Note: Due to the small sample sizes most cells in this table, the table should be interpreted with caution.

<sup>1</sup>Situations in which the worker must perform a job of different nature from that specified during recruitment without a person's consent

<sup>2</sup>Abusive requirements for overtime or on-call work that were not previously agreed with the employer

<sup>3</sup>Work in hazardous conditions to which the worker has not consented, with or without compensation or protective equipment

<sup>4</sup>Work with no or limited freedom to terminate work contract

<sup>5</sup>Debt bondage or manipulation of debt

<sup>6</sup>Withholding of wages or other promised benefits

<sup>7</sup>Abuse of workers' vulnerability through the denial of rights or privileges, threats of dismissal or deportation (includes exclusion from future employment, financial penalties)

\*\*Statistically significant, defined as  $p < 0.05$ , by chi-square test

**Table D-2. Most common indicators of involuntariness or coercion by primary mining activity**

	Cleaning or preparing tools or worksite % (SE)	Moving materials within the mine site or outside the mine % (SE)	Administrative work related to the mine % (SE)	Digging for ore using machines % (SE)	Supervising mine workers % (SE)
Restrictions on workers' movement	96.4% (3.3)	90.0% (6.7)	83.7 (2.8)	71.3% (6.0)	86.4% (10.3)
Abuse of workers' vulnerability through the denial of rights or privileges, threats of dismissal or deportation (includes exclusion from future employment, financial penalties)	60.0% (5.1)	64.1% (12.4)	47.9% (11.1)	50.5% (10.4)	61.1% (15.7)
Work in hazardous conditions to which the worker has not consented, with or without compensation or protective equipment	43.8% (6.4)	44.0% (7.4)	20.5% (5.4)	50.9% (5.4)	50.8% (16.0)
Abusive requirements for overtime or on-call work that were not previously agreed with the employer	31.6% (5.0)	35.4% (9.8)	39.5% (8.4)	34.6% (7.8)	59.1% (16.5)
<b>Number of respondents (N)</b>	48	43	41	40	31

Note: Due to the very large standard error for most estimates in this table, the entire table should be interpreted with considerable caution.

**Table D-3. Mining hazards by primary mining activity**

	Digging ore without machines % (SE)	Moving materials within the mine site or outside the mine % (SE)	Cleaning or preparing tools or worksite % (SE)	Buying or selling ore or other excavated materials % (SE)	Digging for ore using machines % (SE)
Excessive noise without appropriate protective equipment (a)	90.8% (5.4)	58.3% (12.4)	74.0% (11.7)	84.8% (18.9)	74.0% (11.5)
Extreme heat without sufficient breaks or without access to clean water (b)	74.3% (22.8)	51.2% (13.7)	56.5% (15.0)	0.0% (0.0)	69.4% (12.6)
Dangerous chemicals without appropriate protective equipment (c)	84.7% (9.0)	52.9% (12.1)	72.3% (7.9)	84.8% (18.9)	72.9% (8.5)
Dangerous or sharp tools or heavy machinery without appropriate protective equipment (d)	100% (0.0)	60.4% (13.7)	72.0% (7.8)	84.8% (18.9)	45.6% (7.2)
Carrying unreasonably heavy loads (e)	90.8% (5.4)	43.7% (16.0)	48.6% (10.1)	84.8% (18.9)	65.1% (12.0)
Dust or strong fumes without appropriate protective equipment (f)	85.1% (8.8)	75.9% (10.3)	69.9% (8.9)	84.8% (18.9)	74.5% (6.1)
Insecure tunnels (g)	43.7% (33.2)	24.9% (15.2)	43.2% (14.7)	0.0% (0.0)	29.8% (6.1)
<b>Number of respondents (N)</b>	434	78	57	55	54

Note: Due to the very large standard error for most estimates in this table, the entire table should be interpreted with considerable caution.

**Table D-4. Number of indicators of involuntariness experienced by employed workers (weighted)**

Number of indicators	Indicators of involuntariness	
	%	n
0	19.7	75
1	31.5	101
2	23.0	75
3	16.9	69
4	4.9	13
5	4.2	7
6	0.0	0
7	0.0	0
8	0.0	0
<b>Total</b>	<b>100</b>	<b>340</b>

**Table D-5. Number of indicators of coercion experienced by employed workers (weighted)**

Number of indicators	Indicators of coercion	
	%	n
0	6.2	33
1	34.4	124
2	54.6	158
3	4.5	22
4	0.4	3
5	0.0	0
6	0.0	0
7	0.0	0
8	0.0	0
<b>Total</b>	<b>100</b>	<b>340</b>

**Table D-6. Number of indicators of coercion or involuntariness experienced by employed workers who experience forced labor (weighted)**

Number of indicators	Total indicators	
	%	n
2	18.7	45
3	24.3	63
4	28.0	67
5	15.4	45
6	8.7	25
7	4.8	5
8	0.1	1
<b>Total</b>	<b>100</b>	<b>251</b>

## APPENDIX E: COMPARISON OF COBALT AND NON-COBALT MINE WORKERS

**Table E-1. Type of mine site, whether works for employer or self, and prevalence of forced labor for cobalt and non-cobalt mine workers (weighted)**

	Cobalt		Non-cobalt <sup>1</sup> (Primarily copper)	
	% (SE)	N	% (SE)	N
<b>Type of mine site</b>		945		64
ASM	71.6% (8.6)		57.8% (18.8)	
LSM	28.4% (8.6)		42.2% (18.8)	
<b>Works for employer or self</b>		946		64
Employer	72.0% (8.7)		57.1% (18.8)	
Self	28.0% (8.7)		42.9% (18.8)	
<b>Forced labor among employed workers<sup>2</sup></b>	77.9% (3.1)	340	71.1% (5.1)	31

<sup>1</sup> 97% mine copper, and the remaining mine malachite or other ores not specified.

<sup>2</sup> Difference in rates of forced labor between cobalt and non-cobalt miners is not statistically significant ( $p = 0.378$ ).