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Responsible and sustainable sourcing of battery raw materials

*Insights from hotspot
analysis, company disclosures
and field research*

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Contents

- Acknowledgements 4
- Abstract 6
- 1. Introduction 8
 - 1.1. Policy context 8
 - 1.2. Conflict minerals and responsible sourcing 8
 - 1.3. The case of cobalt 9
 - 1.4. Research questions and structure of this report 10
- 2. Hotspot analysis of battery supply chain 12
 - 2.1. Methodology 12
 - 2.1.1. Selection of relevant risk aspects, related indicators and sources of data 12
 - 2.1.2. Selection of relevant countries in the battery supply chain 14
 - 2.1.3. Attribution of risk levels to the selected countries and identification of hotspots 16
 - 2.2. Results of the hotspots analysis 24
 - 2.3. Interpretation of the results 26
 - 2.4. Main findings of the chapter 30
- 3. Corporate-level social data disclosure 31
 - 3.1. Methodology 32
 - 3.2. Analysis 32
 - 3.2.1. Cobalt 34
 - 3.2.2. Graphite 35
 - 3.2.3. Lithium 35
 - 3.2.4. Manganese 35
 - 3.3. Main findings of the chapter 37
- 4. Responsible and sustainable supply of battery materials: review of the main initiatives and standards ... 38
 - 4.1. Responsible sourcing frameworks and guidance 38
 - 4.1.1. OECD due diligence guidance for responsible mineral supply chains 38
 - 4.1.2. International Finance Corporation’s performance standards on environmental and social sustainability 39
 - 4.1.3. China Chamber of Commerce of Metals, Minerals & Chemicals Importers and Exporters’ Guidance 40
 - 4.1.4. Social life-cycle assessment 40
 - 4.2. Responsible sourcing initiatives focusing on cobalt 41
 - 4.2.1. Cobalt Industry Responsible Assessment Framework 42
 - 4.2.2. Umicore sustainable procurement framework for Cobalt 42
 - 4.2.3. Responsible Cobalt Initiative of the CCCMC 44
 - 4.2.4. Responsible Minerals Initiative cobalt due diligence standard and reporting template ... 44
 - 4.2.5. Eurasian Resources Group Clean Cobalt Framework 45
 - 4.2.6. Projects on cobalt artisanal mining 46

4.3.	Main findings of the chapter	46
5.	Field investigation on two responsible sourcing initiatives operating in artisanal mining of cobalt in the Democratic Republic of the Congo	48
5.1.	The Congolese 2C ASM sector	48
5.1.1.	Governance of the artisanal and small-scale cobalt- and copper-mining sector.....	49
5.1.2.	Location of ASM activities	49
5.1.3.	Monitoring and oversight.....	51
5.1.4.	Participation of politically exposed persons.....	51
5.1.5.	Role and influence of cooperatives	51
5.1.6.	Human rights risks in the artisanal and small-scale cobalt- and copper-mining sector... 52	
5.2.	Artisanal and small-scale cobalt- and copper-mining value chains	56
5.2.1.	Mining.....	57
5.2.2.	Trading and export.....	58
5.3.	Existing systems.....	59
5.3.1.	Better Mining and Kasulo site.....	59
5.3.2.	Mutoshi Cobalt Pilot	61
5.4.	Methodology used for the analysis of pilot projects.....	63
5.5.	Evidence from the sites.....	64
5.5.1.	Presence of armed groups.....	66
5.5.2.	Presence of armed forces	66
5.5.3.	Serious human right violations	66
5.5.4.	Forced labour.....	67
5.5.5.	Worst forms of child labour	67
5.5.6.	Corruption and bribery.....	67
5.5.7.	Misdeclaration of origin of minerals.....	68
5.5.8.	Payment of taxes.....	68
5.5.9.	Displacement and resettlement	69
5.5.10.	Occupational health and safety.....	69
5.5.11.	Environmental and public health impacts	70
5.5.12.	Indigenous peoples' rights.....	70
5.5.13.	Minorities and discrimination	70
5.5.14.	Gender.....	70
5.5.15.	Other considerations.....	71
5.6.	Main findings of the chapter	73
6.	Conclusions.....	75
6.1.	Outlook and next steps	76
	References.....	78
	Abbreviations	84
	List of figures	86
	List of tables	87

- 7. Annexes 88
 - 7.1. Annex 1. Methodological notes on the hotspot analysis..... 88
 - 7.2. Annex 2. Company-based data used in Chapter 3..... 90
 - Cobalt..... 90
 - Natural graphite 93
 - Lithium 93
 - Manganese 98
 - Nickel..... 99
 - 7.3. Annex 3. Complete lists of risk categories addressed by initiatives and standards discussed in Chapter 4 104
 - International Finance Corporation’s Performance Standards on Environmental and Social Sustainability .. 104
 - 7.4. Annex 4. Detailed methodology of the case study presented in Chapter 5 108

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Abstract

Used in e-mobility and electronics, batteries are essential to achieve the EU objective of decarbonisation of the economy and other challenges related to sustainable development. Several policy initiatives have been issued and others are under discussion to promote sustainable and competitive production of batteries in the EU.

Recently, various stakeholders highlighted social risks related to supply chains of batteries and in particular in regard to the provision of raw materials. Cobalt is especially concerning when it comes to human rights abuses, child labour and life-threatening working conditions in the Democratic Republic of the Congo (DRC). That country provides around 60 % of the global supply, a significant proportion of it originating from artisanal and small-scale mining (ASM) operators. Reports from non-governmental organisations (NGOs), international organisations and media on this topic have increased in number since 2016, and the issue is now more visible than in 2007, when the first reports on the sector emerged. At the same time, responsible sourcing initiatives have been launched and implemented for cobalt and other materials, most of them aligned with the OECD [Organisation for Economic Co-operation and Development] due diligence guidance for responsible supply chains of minerals from conflict-affected and high-risk areas (OECD Guidance). Among them, EU Regulation 2017/821 will require EU importers of tin, tungsten, tantalum and gold (3TG) to perform due diligence on their supply chain, according to the OECD Guidance. The strategic battery action plan proposed by the European Commission identifies some clear work streams on responsible sourcing. A battery-specific regulation including requirements for the ethical sourcing of materials is also currently under discussion.

The objective of Chapters 2 and 3 is to identify potential risks in the mining stage of battery materials' production, using data at country and corporate levels. Chapter 2 presents a hotspot analysis of primary raw materials used in batteries. It combines data on the mining stage (including global supply, EU sourcing, and reserves and resources) with indicators considered relevant to the responsible sourcing of batteries (i.e. on governance, conflict risk, human and social rights, environmental performance and water risk). These are complemented by insights from the Environmental Justice Atlas, which documents information about conflicts and struggles over the exploitation of natural resources and the related production processes. The analysis resulted in the identification of three main groups of countries that could present risk as global suppliers, as EU suppliers and for future materials supply.

Chapter 3 investigates what information about social sustainability is available at corporate level. Applying an original methodology, it scrutinises publicly available sustainability reports by large-scale and multinational mining companies that produce materials for batteries, taking into account the impact categories proposed in the social life-cycle assessment (S-LCA) framework and the key principles described by the EU Guidelines for non-financial reporting. Although sustainability reporting practice has been increasing in recent years, the level of disclosure is very heterogeneous between companies and only a few sustainability reports are audited by third-party organisations.

Chapters 4 and 5 focus on the initiatives implemented to mitigate the risks identified in the previous chapters, using both data from the literature and primary data. As companies are increasingly asked to perform due diligence on their supply chains, several initiatives, schemes and company strategies have been developed. They are reviewed in Chapter 4, which compares the different requirements and risk categories that have to be scrutinised under the various initiatives. Most of them are aligned with the requirements of the OECD Guidance, while approaches towards artisanal mining differ. Four initiatives are implemented on the upstream phase, and three of those engage with the ASM sector and work on the ground in order to improve working conditions in the DRC. The impacts of two initiatives (those implemented for at least 1 year) are assessed through a field investigation.

The analysis in Chapter 5 is based on a comparison of two visited pilot projects with the general conditions of the cobalt and copper ASM sector in Lualaba and Haut-Katanga provinces in the DRC. The characterisation of pilot sites is based on the collecting of qualitative information through information matrices. These are based on the OECD Guidance and other relevant standards for responsible and sustainable supply, which include the S-LCA framework. This information gathering was complemented by a visit to a third ASM site, where no pilot was implemented. It was chosen as representative of the general ASM sector, and used as a baseline. Given the nature of this work and the amount of primary data collected, an extensive analysis and detailed description of the contexts under investigation are provided. Results show that the systems analysed are rather effective at

implementing the changes that they are designed to implement. This is especially visible when it comes to issues of life-threatening working conditions and child labour. However, risk categories addressed by these projects are dictated by downstream expectations and do not necessarily correspond to the demands of the miners they are designed to protect. For instance, price calculation and income are particularly salient aspects and are not captured by the evaluations. The S-LCA methodology offers a promising avenue to expand the scope of enquiry in a structured manner. Traceability is another key point, as the systems are applied only in small areas of the mining sites. Companies' participation in the pilots could be used to burnish their reputation as a whole, out of proportion to the contribution of the pilot sites to the companies' overall supply. Moreover, the scalability of these pilots within a short time frame is unknown, as the availability of local skilled professionals, among other challenges, might be a critical bottleneck. Overall, the positive results of the systems analysed warrants an appeal to further facilitate (e.g. through funding) the development of similar initiatives.

This study is a first step towards the understanding and quantification of the main risks in battery supply chains at mining stage, and the assessment of the impact of current initiatives implemented on the ground. It sets the stage for a more complete understanding of the concept and practice of responsible sourcing, and proposes a methodology that could be replicated for other materials, other sectors and other applications.

1. Introduction

1.1. Policy context

One of the priorities under the agenda of the new von der Leyen Commission is to ensure ‘free and fair trade’ ⁽¹⁾. In this context, trade should be a means to deliver prosperity and to export the EU’s values around the world. Moreover, trade agreements should include ‘higher standards of climate, environmental and labour protection, with a zero-tolerance policy on child labour’ ⁽²⁾. In the same document, the ‘European Green Deal’ chapter draws up ideas and policy objectives for Europe to become ‘the first climate-neutral continent’ ⁽³⁾. The Green Deal Communication ⁽⁴⁾ defines in more detail the European Commission’s commitment to tackling climate and environmental-related challenges, through key policies and measures. The shift to sustainable mobility and the supply of clean energy are two building blocks of this strategy, which also encompasses socioeconomic objectives such as competitiveness, fairness and inclusiveness.

Batteries are strategic technologies that, used for instance in e-mobility, renewables and electricity provision in off-grid communities, are expected to enable the transition towards a low-carbon economy. Moreover, lithium-ion batteries (hereafter called simply batteries) are widely used in electronics, medical devices and power tools. Demand for them grew by 30 % annually in the period 2010 to 2018 and is expected to grow by 25 % annually till 2030 ⁽⁵⁾, especially because of their use in electric vehicles ⁽⁶⁾. Given the importance of batteries for the EU economy and for environmental objectives, the Commission adopted the strategic action plan ⁽⁷⁾, a comprehensive set of concrete measures to develop an innovative, sustainable and competitive battery ‘ecosystem’ in Europe. These measures could include the promotion of ethical sourcing of raw materials for the battery manufacturers and the setting of sustainability requirements for batteries (e.g. on safety, recyclability, life-cycle impacts, responsible sourcing, etc.) ⁽⁸⁾. These requirements are seen as necessary to meet market expectations for clean battery value chains and also as drivers for the EU’s competitiveness in sustainable battery production.

The disclosure of information on aspects of sustainability is already a legal obligation for large companies with more than 500 employees, as required by Directive 2014/95/EU ⁽⁹⁾. Companies are asked to use existing widely accepted reporting frameworks or to follow the Guidelines on non-financial reporting of the European Commission ⁽¹⁰⁾. Thematic aspects to be considered include environmental matters (e.g. emissions, waste, water, energy), social matters (e.g. employment, health and safety, diversity issues, trade union relationships), respect for human rights, anti-corruption and due diligence on conflict minerals, according to the Organisation for Economic Co-operation and Development (OECD) due diligence guidance for responsible supply chains from conflict-affected and high-risk areas (OECD Guidance) ⁽¹¹⁾.

1.2. Conflict minerals and responsible sourcing

The issue of ‘conflict minerals’ relates to materials (usually tin, tungsten, tantalum and gold, also referred to as 3TG) whose extraction and trade, in politically unstable areas, can be used to finance armed groups, fuel forced labour and other human rights abuses, and support corruption and money laundering ⁽¹²⁾. These minerals, used in a variety of devices such as mobile phones, cars and jewellery, are extracted in several locations in the world, including the Democratic Republic of the Congo (DRC). The profits from the sale of these minerals have financed

⁽¹⁾ von der Leyen, U. (2019), Chapter 5, ‘A stronger Europe in the world’, page 17.

⁽²⁾ von der Leyen, U. (2019), ‘A stronger Europe in the world’, page 17.

⁽³⁾ von der Leyen, U. (2019), Chapter 1, A European Green Deal, page 5.

⁽⁴⁾ European Commission (2019a).

⁽⁵⁾ WEF (2019).

⁽⁶⁾ Tsiropoulos et al. (2018).

⁽⁷⁾ European Commission (2018a), Annex.

⁽⁸⁾ European Commission (2019b).

⁽⁹⁾ Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups.

⁽¹⁰⁾ European Commission (2017a).

⁽¹¹⁾ OECD (2016).

⁽¹²⁾ European Commission (2017b).

fighting in the Second Congo War and ongoing follow-on conflicts⁽¹³⁾. Moreover, in this region armed groups were controlling mines⁽¹⁴⁾. In order to stem the flows of conflict minerals, the United States issued a provision on conflict minerals in 2010⁽¹⁵⁾, requiring specific disclosures for companies importing 3TG from the DRC and neighbouring countries, to make sure they are not funding armed groups or human rights abuses. Similarly, the EU Conflict Minerals Regulation⁽¹⁶⁾, which will come into force on 1 January 2021, requires that EU operators importing 3TG from high-risk and conflict-affected areas will have to carry out due diligence on their supply chains, in accordance with the OECD Guidance. Due diligence is defined as ‘an on-going, proactive and reactive process through which companies can ensure that they respect human rights and do not contribute to conflict’⁽¹⁷⁾. Unlike the US provision, which focuses on imports from the DRC and neighbouring countries, the EU regulation applies to all ‘conflict-affected and high-risk areas’ (CAHRAs), which mean regions ‘in a state of armed conflict or fragile post-conflict as well as areas witnessing weak or non-existent governance and security, such as failed states, and widespread and systematic violations of international law, including human rights abuses’⁽¹⁸⁾. Recommendations on how to identify CAHRAs were published in 2018⁽¹⁹⁾.

1.3. The case of cobalt

In the last years, similar concerns to those about 3TGs have been raised about cobalt, a material contained in batteries and consequently in electric vehicles. Various stakeholders have highlighted supply chain risks related to raw materials in batteries, identifying cobalt as the material presenting the highest risk, especially concerning human rights abuses, child labour and poor working conditions⁽²⁰⁾ in the DRC, where most of the global cobalt production comes from. Moreover, in the DRC artisanal and small-scale mining (ASM) is a central source of revenues for about 2 million people, according to World Bank estimates⁽²¹⁾.

NGOs and research institutes have been denouncing socioeconomic consequences of artisanal cobalt mining in the DRC since at least 2007⁽²²⁾. An Öko-Institut study came out in 2011⁽²³⁾. Violence against women and child labour in artisanal mining sites in the region of cobalt extraction were described in a report from the Good Shepherd Sisters⁽²⁴⁾. In 2016, an Amnesty International report⁽²⁵⁾ brought the issue to wide public attention, stressing the link between undignified conditions on the ground and environmental objectives that batteries are supposed to contribute to. Other reports published from 2016 onwards addressed the social conditions in artisanal cobalt and copper mines (as the two materials are often mined together). A report from the Dutch Centre for Research on Multinational Corporations (SOMO) focuses on environmental pollution and human rights violations⁽²⁶⁾. Findings from a survey covering the economic well-being and health of households as well as the role of artisanal mining in their livelihoods were published in 2017⁽²⁷⁾. The Canadian International Institute for Sustainable Development (IIISD) published in 2018 an analysis of materials needed to enable the transition to a low-carbon economy, and the level of governance, conflicts and state fragility in producing countries⁽²⁸⁾.

⁽¹³⁾ Global Witness (2009)

⁽¹⁴⁾ The control of armed groups over mines can be of three different types: (i) armed groups physically control mines or force civilian labourers to mine, transport or sell conflict minerals; (ii) they tax, extort, or control any part of trade routes for conflict minerals; (iii) they tax, extort or control trading facilities, in whole or in part, including the point of export from the DRC or an adjoining country (US Congress 2010).

⁽¹⁵⁾ Dodd-Frank Act, Section 1502.

⁽¹⁶⁾ Regulation (EU) 2017/821 of the European Parliament and of the Council of 17 May 2017 laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas.

⁽¹⁷⁾ OECD (2016).

⁽¹⁸⁾ Regulation (EU) 2017/821.

⁽¹⁹⁾ Commission Recommendation (EU) 2018/1149 of 10 August 2018 on non-binding guidelines for the identification of conflict-affected and high-risk areas and other supply chain risks under Regulation (EU) 2017/821 of the European Parliament and of the Council.

⁽²⁰⁾ RCS Global (2017).

⁽²¹⁾ Delve (n.d.).

⁽²²⁾ Swedwatch (2007).

⁽²³⁾ Tsurukawa et al. (2011).

⁽²⁴⁾ Good Shepherd Sisters (2013).

⁽²⁵⁾ Amnesty International (2016).

⁽²⁶⁾ SOMO (2016).

⁽²⁷⁾ Faber et al. (2017).

⁽²⁸⁾ Church and Crawford (2018).

On the other hand, some reports describe impacts linked to of Large Scale Mining (LSM) operations, e.g. related to corruption and bribery, and observe how the exclusion of artisanal miners leads to increasing tension and hostility between ASM and LSM ⁽²⁹⁾.

In 2019, BGR conducted an inventory of the cobalt and copper sector through an artisanal mines survey in the key cobalt-producing provinces of Lualaba and Haut-Katanga in the DRC ⁽³⁰⁾. The OECD, focusing on the same areas, analysed prevalent risks and strategies for building more responsible mineral supply chains in a report published in 2019 ⁽³¹⁾.

Some initiatives and standards for the responsible sourcing of cobalt have been launched and implemented in the last few years. They have different scopes, and can be applied at different stages in the supply chain (mining, smelting/refining, manufacturing, etc.). Moreover, some of them aim at responsible sourcing, i.e. ensuring and demonstrating that the minerals used in supply chains are produced by responsible mining practices and handled responsibly, according to specific demands of responsible mining/sourcing standards. Others have a wider scope and embrace sustainability issues.

In this report we refer to responsible sourcing as encompassing all the risk categories included in the OECD Guidance, which mainly regard serious human rights abuses, corruption, money laundering, tax evasion and other aspects strictly related to mineral supply chains. By sustainable sourcing/supply we mean a broader concept, in which both environmental and social aspects are important. In this context, however, we focus mainly (but not exclusively) on social sustainability, as defined by the main widely accepted sustainability frameworks. In particular, we refer to S-LCA methodology ⁽³²⁾ and to the International Finance Corporation's (IFC's) Performance Standards on Environmental and Social Sustainability (PS) ⁽³³⁾. While the latter define the IFC clients' responsibilities for managing their environmental and social risks and are therefore designed for investment projects, S-LCA was developed in an academic context to evaluate social impacts mainly at product level, taking into account the various steps of the supply chain ⁽³⁴⁾. In these frameworks (and also others not under consideration here, for instance the Global Reporting Initiative – GRI), social sustainability denotes a variety of aspects that range from working conditions (e.g. health and safety, wages, benefits) to local communities' rights and also include most of the aspects characterising the concept of responsible sourcing, e.g. human rights abuses, corruption, child labour. However, these frameworks are designed to be applied to any economic activity and therefore specific aspects related to conflict minerals (such as the presence of armed groups and control of mines by them) are not taken into account.

1.4. Research questions and structure of this report

This report explores the topic of responsible sourcing for raw materials used in batteries, focusing on the mining stage and using different kinds of data: country-based indicators, self-reported company disclosures, information from literature and primary data collected at mining sites. These data, having different natures, granularities and sources, are complementary and make it possible to (i) explore the set of potential risks, drawing a big picture of social risks in the extraction of battery materials (Chapters 2 and 3) and (ii) scrutinise the initiatives launched to prevent such risks, investigating more specifically those related to cobalt extraction in the DRC. The report is structured in four chapters (plus introduction and conclusions), each one seeking to address different questions. This structure and the different scopes, natures of data and objectives of the chapters are also illustrated in Figure 1.

⁽²⁹⁾ E.g. Global Witness (2014); Resource matters (2019); OECD (2019)

⁽³⁰⁾ BGR (2019).

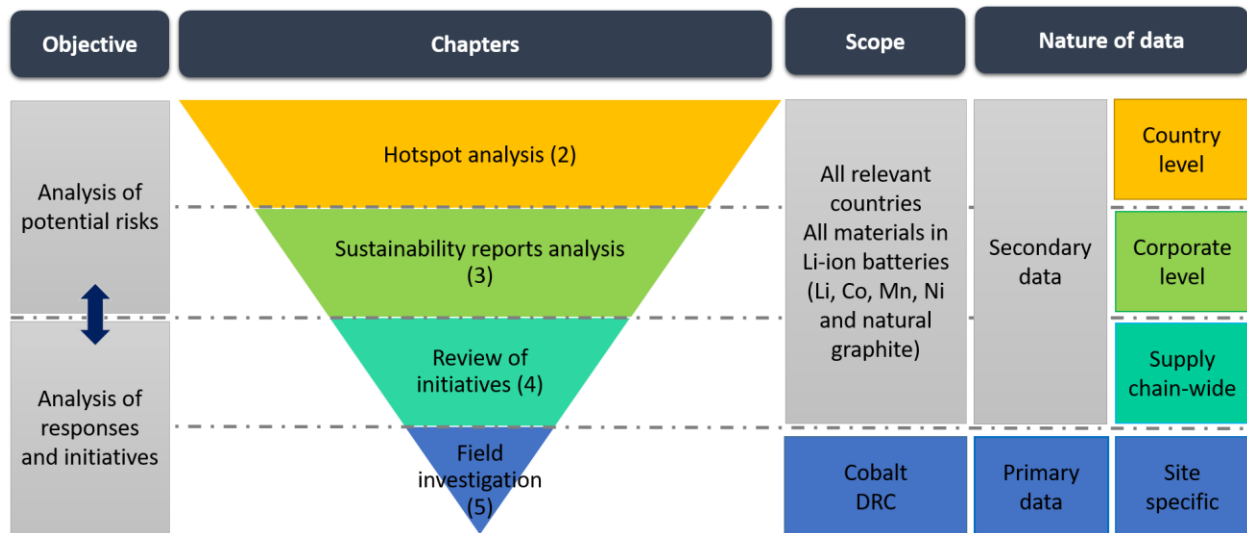
⁽³¹⁾ OECD (2019).

⁽³²⁾ UNEP/SETAC Life Cycle Initiative (2009).

⁽³³⁾ International Finance Corporation (2012).

⁽³⁴⁾ A new approach to implementing the methodology is the social organisational life-cycle assessment.

Figure 1 Structure of the report, including objectives, scope and nature of data used in the various chapters



Chapter 2 scrutinises which are the materials and the countries presenting the highest risks in battery supply chains, from a responsible and sustainable sourcing point of view. Supply data are matched with risk scores assigned to a set of relevant country-based indicators on governance, conflict risk, social and human rights, environmental performance and water risk. Even though some studies have been published on this topic (e.g. Church and Crawford, 2018), the hotspot analysis described in this report both considers important global players as battery material suppliers and also looks from an EU perspective at the main EU trading partners. Moreover, countries that own reserves and resources and thus have a potential risk for future supply are considered.

Passing from country to company level, Chapter 3 reviews sustainability reports and websites of the main mining companies that produce materials used in batteries, in order to explore the levels of disclosure of these corporations and their usability for a social impact assessment. Indicators used by companies to monitor their social impacts are matched against those proposed by the S-LCA framework and the principles of the European Commission Guidelines on non-financial reporting.

As many companies have started to adhere to responsible sourcing initiatives, or to produce their own strategies to manage risk in the supply chain, Chapter 4 reviews the main standards and initiatives for responsible and sustainable sourcing, promoted by international organisations, industries and other entities. Given the variety of existing sustainability schemes, only a few of them are mentioned in this review, although it aims to be exhaustive about the responsible sourcing initiatives focusing on cobalt.

While some of the responsible sourcing initiatives and companies' strategies aim to avoid 'dirty' materials ending up in their supply chains, few initiatives have the ambition of improving social conditions on the ground and engage with the artisanal mining sector in the DRC. Using a qualitative research method, Chapter 5 presents an investigation into two of them that have been implemented for more than 1 year. Questionnaires, typically used in social science investigation, are replaced here by information matrices, considered more suitable to informal contexts. This chapter aims to answer the following questions: What is the impact of these responsible sourcing initiatives on the ground? What are the risk categories where improvements can be registered? What are the main challenges?

The conclusions of the report summarise the main lessons learned from the above chapters concerning the responsible and sustainable sourcing of battery materials and suggest next steps to improve the understanding of responsible sourcing.

2. Hotspot analysis of battery supply chain

A hotspot analysis is a screening tool, which allows potential critical issues to be detected in a large set of quantitative or qualitative data⁽³⁵⁾. It can be used in various disciplines, but is particularly suitable to studying sustainability in complex supply chains⁽³⁶⁾. When applied to life-cycle assessment, it assists in the identification of areas (life-cycle stage/actor/type of impact) to be prioritised for action⁽³⁷⁾. In the case of a social life-cycle assessment methodology, for example, it highlights sectors, countries, stakeholders and impact categories to be further investigated through the collection of primary data.

In this study, we applied a hotspot analysis to the supply of primary raw materials used in batteries, combining data on the supply of battery materials with indicators considered relevant to the responsible sourcing of batteries. The materials under consideration are cobalt, lithium, nickel, manganese and natural graphite.

The objective of the analysis is to detect potential criticalities in the materials value chain, thus using country-based data to identify which material supplier countries can be at risk in relation to the selected aspects. The goal of the analysis is to shed light on the country–material combinations potentially critical from a responsible sourcing point of view in the battery value chain. Therefore, similar analysis could be used as a starting point for a supply chain due diligence process.

The chosen indicators and the methodology are described in the next section, while Section 2.2 shows the results and Section 2.3 describes their interpretation. Section 2.4 summarises the main findings of the chapter.

2.1. Methodology

The hotspot analysis has been performed following three main steps:

selection of risk aspects that are material for responsible sourcing, related indicators and sources of data,

selection of countries involved in the battery supply chain,

data gathering, attribution of risk levels to the selected countries and identification of hotspots.

2.1.1. Selection of relevant risk aspects, related indicators and sources of data

Concerning the first step, existing frameworks and programmes for responsible sourcing take into account various social aspects, some of them also including environmental aspects. In most cases, responsible sourcing initiatives aim to ensure that the extraction of materials does not imply, or is not linked with, human rights violations and conflicts.

Responsible sourcing is usually more challenging when importing from countries that have weak governance, high levels of corruption and conflicts in their territories. Several data sources provide information on these aspects at country level that, combined with data on material supply, can be used to perform a first screening of potential risks in terms of country–material combinations.

In order to select relevant indicators linked to responsible sourcing, the OECD Guidance on responsible mineral supply chains indicates the relevant aspects to be taken into account⁽³⁸⁾. It includes:

serious abuses associated with the extraction, transport or trade of minerals,

torture, cruel, inhuman and degrading treatment,

forced or compulsory labour,

the worst forms of child labour,

other gross human rights violations and abuses such as widespread sexual violence,

war crimes or other serious violations of international humanitarian law, crimes against humanity or genocide,

⁽³⁵⁾ Liedtke et al. (2010).

⁽³⁶⁾ Rohn et al. (2014).

⁽³⁷⁾ Barthel et al. (2017).

⁽³⁸⁾ OECD (2016).

direct or indirect support to non-state armed groups,
public or private security forces in the mining sites,
bribery and fraudulent misrepresentation of the origin of minerals,
money laundering,
payment of taxes, fees and royalties due to governments.

The abovementioned aspects are considered the reference guidance for companies performing due diligence and for most of the responsible sourcing programmes.

However, to be able to characterise all these aspects, it is necessary to have access to trustable sources of data and databases, and unfortunately most of these aspects are not covered by global and harmonised databases. Reviewing the existing data sources and building on previous studies on social risk in the raw material sectors ⁽³⁹⁾, we identified the following data sources as relevant to our analysis.

1. **Worldwide Governance Indicators** ⁽⁴⁰⁾ include an indicator on corruption and one on the rule of law, which can be considered proxies' for the components on bribery and money laundering listed in the OECD Guidance.
2. The **Resources Governance Index** ⁽⁴¹⁾ measures the quality of resource governance.
3. The **Inform** ⁽⁴²⁾ human hazard component assesses conflict risk and is supposed to reflect the second point of the OECD Guidance, on direct or indirect support to non-state armed groups. In addition, to better characterise conflict risk, we add in the analysis the **Global Peace Index (GPI)** and **Fragile State Index**. The latter defines fragility using 12 indicators relating to internal cohesion, the economy, politics, cross-cutting factors including demographic pressures, refugees and internally displaced persons, and external intervention. The GPI is developed by the Institute for Economics & Peace and ranks 163 countries according to 23 qualitative and quantitative indicators on peace ⁽⁴³⁾.
4. Databases used in S-LCA (**Social Hotspot Database** ⁽⁴⁴⁾ and Product Social Impact Life Cycle Assessment – **PSILCA** ⁽⁴⁵⁾) include data on some of the serious abuses listed in the OECD Guidance (e.g. forced labour, child labour, human rights violations).

In addition, we selected other aspects that, even though not mentioned by the OECD Guidance, are relevant to the sustainability of the extractive sectors. These include two indicators on environmental aspects (the **Environmental Performance Index** ⁽⁴⁶⁾ and the **Water Risk Index** ⁽⁴⁷⁾). They allow the ecological dimension to be included in the responsible sourcing concept, recognising that severe environmental impacts and water scarcity can imply other social impacts (e.g. affecting human health) and in some cases can generate conflicts ⁽⁴⁸⁾.

Conflicts arising over the extraction of natural resources, as documented in the **Environmental Justice (EJ) Atlas** ⁽⁴⁹⁾, are also taken into account. This database provides an insight into the social acceptance of mining projects by local communities, and also reports social and environmental impacts of mining and other industrial projects. However, as it is a community-driven tool some biases should be acknowledged. For instance, it requires communities to be informed and literate enough to submit the case. Developing countries with low Human Development Index scores are therefore likely to be under-represented.

⁽³⁹⁾ Mancini and Sala (2018); Mancini et al. (2018).

⁽⁴⁰⁾ Kaufmann et al. (2010)

⁽⁴¹⁾ NRG (2017)

⁽⁴²⁾ Marin-Ferrer et al. (2017)

⁽⁴³⁾ Institute for Economics & Peace (n.d.).

⁽⁴⁴⁾ Benoit-Norris et al. (2012)

⁽⁴⁵⁾ Eisfeldt (2017)

⁽⁴⁶⁾ Wendling et al. (2020)

⁽⁴⁷⁾ WRI (2019)

⁽⁴⁸⁾ Kemp et al. (2010).

⁽⁴⁹⁾ <https://ejatlas.org/>

The indicators chosen to perform the hotspot analysis and their relevance to responsible sourcing are described in Section 2.1.3.

2.1.2. Selection of relevant countries in the battery supply chain

Concerning the second phase of the analysis, data on supply of raw materials for batteries have been collected using the data sources described in Table 1. They regard (i) reserves and resources, which give an indication of potential future suppliers; (ii) global production, the main producing countries shown in Figure 2; and (iii) EU sourcing⁽⁵⁰⁾, which reflects the suppliers to the EU. The values, provided in tonnes by the original sources, have been converted into percentages of totals. A cut-off rule of > 10 % has been applied to the three categories: only countries having more than 10 % in at least one category (reserves and resources, global supply, EU sourcing) have been considered hotspots.

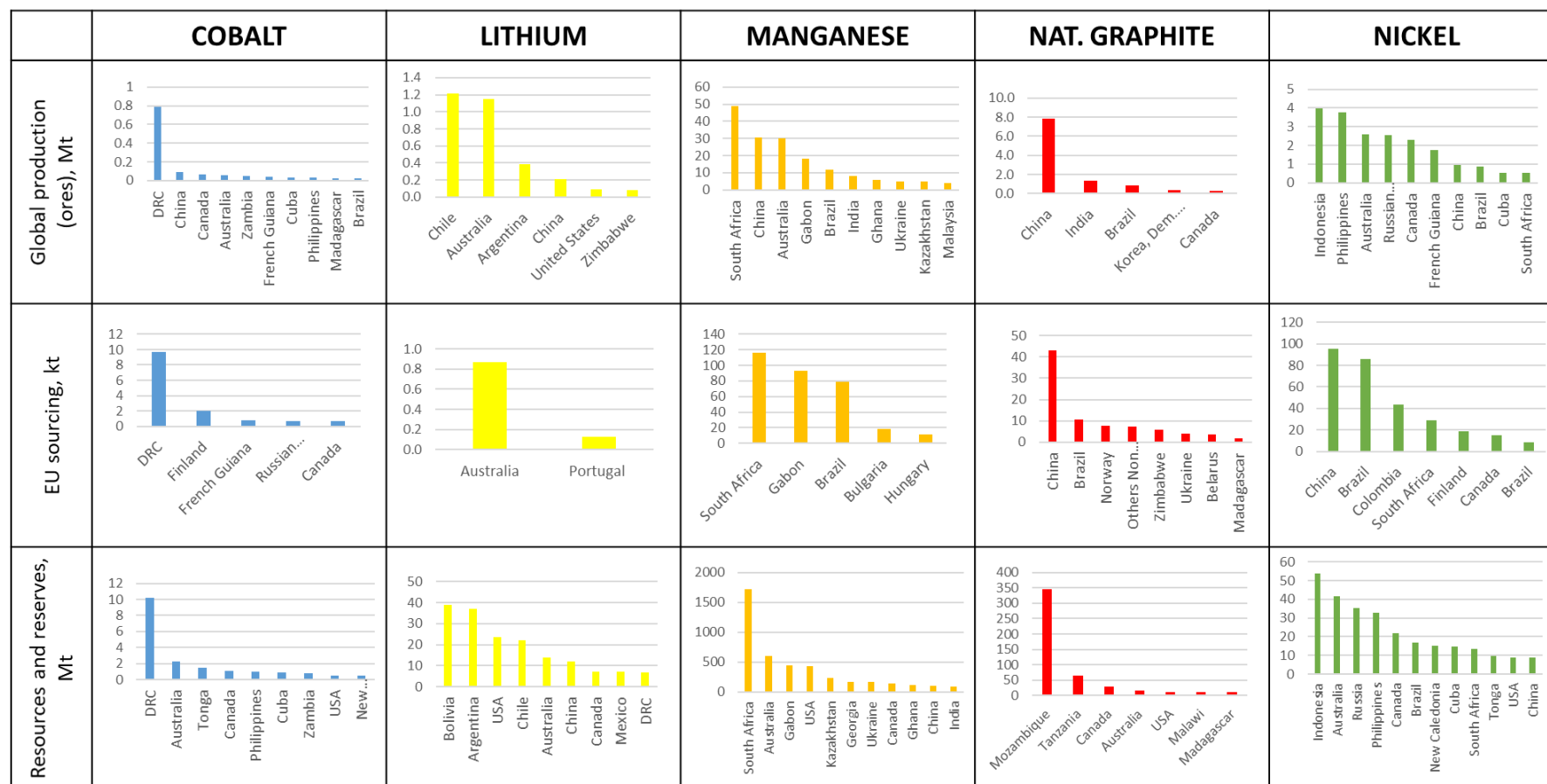
Table 1 Data on raw materials supply and related data sources

Category	Description	Unit of measurement	Data source	Reference year
Reserves and resources	Sum of resources and reserves reported by materials and by country	Percentage of total (by country)	S&P Global Market Intelligence Database	Assessed in 2019
Production	Mine production of materials	Percentage of total (by country)	World Mining Data	Average 2012-2016
EU sourcing	Sum of import and raw material production (at mining stage) from EU countries	Percentage of total (by country)	World Mining Data, Eurostat, UN Comtrade	Average 2012-2016

Note: See methodological notes in Annex 1 for definitions and further explanation of data sources.

⁽⁵⁰⁾ Please note that EU sourcing refers to raw or raw refined materials at the mining stage. Materials entering the EU at a refined stage or in components and semi-manufactured products are not taken into account here.

Figure 2 Main players in the production of materials for batteries



kt, thousand tonnes; Mt, million tonnes.

[Note: Cut-off criteria: < 2 %. EU sourcing (raw in the middle) refers to direct raw (or raw refined) material and not to sourcing of (semi)-finished products and components that incorporate materials.]

2.1.3. Attribution of risk levels to the selected countries and identification of hotspots

In the third phase of the analysis, the value of each indicator/index was transformed to a risk level (from low to very high), as explained in the corresponding sections. Sections 2.1.1 to 2.1.5 describe the chosen indicators in detail, including the data sources and the assigned risk levels.

Governance

Resource-rich countries can benefit from their natural resource endowment, which can lead to economic growth and development. Yet, in other cases, countries rich in natural resources tend to grow more slowly, and experience conflicts and deindustrialisation⁽⁵¹⁾. According to several studies, governance and institutions are very relevant factors in determining one outcome or the other⁽⁵²⁾. Looking at the governance of material supplier countries can therefore provide a first insight into the risk that countries present to responsible sourcing.

The Worldwide Governance Indicators (WGI) project reports on six broad dimensions of governance for over 200 countries and territories over the period 1996–2017⁽⁵³⁾:

- voice and accountability,
- political stability and absence of violence,
- government effectiveness,
- regulatory quality,
- rule of law,
- control of corruption.

The WGI are produced by the Natural Resource Governance Institute, the Brookings Institution and the World Bank Development Research Group. The project compiles and summarises information from different types of data sources, e.g.:

- surveys of households and firms,
- commercial business information providers,
- NGOs,
- public-sector organisations.

The WGI are widely used to assess countries' governance at global level, and provide yearly updates of governance estimates and country ranking. These indicators are also used in the assessment of critical raw materials for the EU⁽⁵⁴⁾ in order to estimate country risk. To our knowledge, this is the most reliable and widely acknowledged source for governance data at global level.

The values of the WGI range from –2.5 to 2.5 (higher values corresponding to better performance). In this analysis the risk levels have been assigned by dividing the range into four equal parts, as shown in Table 2, and considering the average of the six components of the WGI.

Table 2 Risk levels for Worldwide Governance Indicators

Score	Risk level	WGI values (- 2.5 to 2.5)
1	Low	1.25 to 2.5
2	Medium	0 to 1.24
3	High	-1.24 to 0
4	Very high	-1.25 to – 2.5

⁽⁵¹⁾ See, for example, Anderson (1998); Sachs and Warner (2001)

⁽⁵²⁾ See, for example, van der Ploeg, F. (2011); Sachs and Warner (2001).

⁽⁵³⁾ <https://info.worldbank.org/governance/wgi/>

⁽⁵⁴⁾ Blengini et al. (2017).

In order to look more specifically into the management of natural resources, we also took into account the Resource Governance Index (RGI). This index measures the quality of governance in the oil, gas and mining sector in 58 countries. The RGI scores and ranks the countries, relying on a detailed questionnaire completed by researchers with expertise in the extractive industries. The index assesses the quality of four key governance components: institutional and legal setting; reporting practices; safeguards and quality controls; and enabling environment. We complemented the WGI analysis using RGI values for mining only (we did not use the data on the oil and gas sector).

Even though the RGI is available only for some countries, we consider this information very relevant because it investigates the functioning of the extractive sector, determining whether or not society benefits from resource extraction. This is done analysing the procedures and the legislations in the countries under investigation. Therefore, the RGI complements the general information on governance provided by the WGI with sector-specific knowledge.

The risk levels are assigned using the conversion values shown in Table 3.

Table 3 Risk levels for Resource Governance Index

Score	Risk level	RGI values (0 to 100)
1	Low	> 60
2	Medium	45 to 59
3	High	30 to 44
4	Very high	< 30

Conflicts

Raw material extraction can be linked to conflicts, especially in developing and low-governance countries. This has been true of diamonds, the illicit trade in which has funded brutal wars in Angola and other African countries such as the Central African Republic, the DRC, Liberia and Sierra Leone, resulting in the death and displacement of millions of people⁽⁵⁵⁾. Similarly, conflict minerals came to the public’s attention in the 2000s, when some NGOs denounced the fact that profits from the illegal extraction of and trade in coltan were financing the activities of armed groups and protracting the wars in the DRC.

In response to the conflict diamond issues, the Kimberley Process Certification Scheme (KPCS) was set up in 2003 to prevent the flow of conflict diamonds, and EU Regulation 2017/821⁽⁵⁶⁾ set due diligence obligations for importers of tin, tantalum and tungsten, their ores and gold from conflict-affected and high-risk areas. In the US, Section 1502 of the Dodd–Frank Act was signed into law in July 2010 and requires publicly traded companies to disclose the source of 3TG. The law is aimed at dissuading companies from continuing to engage in trade that supports regional conflicts in the DRC.

Looking at conflict risk makes it possible to detect which suppliers could potentially be more critical than others for responsible sourcing, and which countries should be prioritised in an in-depth analysis.

The indicator chosen to analyse this aspect is a component of the composite indicator Index for Risk Management (Inform)⁽⁵⁷⁾. Inform is designed to support decisions about prevention, preparedness and response. Developed by the JRC, it is a global, open-source risk assessment for humanitarian crises and disasters. The model used to calculate the final indicator combines three main dimensions and six risk categories (Figure 3). The component used in our assessment is human hazard, and is a combination of data on the current conflict intensity (for countries experiencing conflicts in the reporting year) and the projected conflict intensity (for countries without conflict in that year) (Figure 4). The data sources for the two components are the following.

⁽⁵⁵⁾ Global Witness (1998).

⁽⁵⁶⁾ Regulation (EU) 2017/821 of the European Parliament and of the Council of 17 May 2017 laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas.

⁽⁵⁷⁾ European Commission (n.d.).

1. The **Conflict Barometer** ⁽⁵⁸⁾ of the Heidelberg Institute for International Conflict Research. The conflict intensity is determined by two criteria: instruments on the use of force (use of weapons and use of personnel) and the consequences of the use of force (casualties, refugees and demolition). Inform clusters these data in three different groups, distinguishing (i) conflicts over national power in a country (national power), (ii) conflicts over intrastate items other than national power, such as secession (subnational), and (iii) interstate conflicts ⁽⁵⁹⁾.
2. The **Global Conflict Risk Index**. If a country does not experience highly violent conflict in the year of observation, Inform estimates the projected risk of conflict using the Global Conflict Risk Index ⁽⁶⁰⁾. It is based on a quantitative model developed by the JRC that uses structural indicators to determine a given country's risk for conflict. It uses 26 quantitative variables including, among others, a country's regime type, its conflict history and other socioeconomic, political, geographic and security variables that contribute to the outbreak of civil war.

Figure 3 Risk components of the composite indicator Inform

Risk	INFORM																
Dimensions	Hazard & Exposure				Vulnerability				Lack of Coping Capacity								
Categories	Natural		Human		Socio-Economic		Vulnerable Groups		Institutional	Infrastructure							
Components	Earthquake	Tsunami	Flood	Tropical cyclone	Drought	Current Conflict Intensity	Projected Conflict Intensity	Development & Deprivation (50%)	Inequality (25%)	Aid Dependency (25%)	Uprooted People	Other Vulnerable Groups	DRR	Governance	Communication	Physical Infrastructure	Access to Health System

Source: Marin-Ferrer et al. (2017)

⁽⁵⁸⁾ Heidelberg Institute for International Conflict Research (2013).

⁽⁵⁹⁾ Details of the elaboration of conflict data in Inform are available in Marin-Ferrer et al. (2017)

⁽⁶⁰⁾ Halkia et al. (2017).

Figure 4 Influence of each variable in each concept on the overall score

Category	Human Hazard			
Component	MAXIMUM			
	Current Conflict Intensity		Projected Conflict Intensity	
Aggregation	MAXIMUM		GEOMETRIC AVERAGE	
Core indicator	Conflict Barometer (Subnational)	Conflict Barometer (National Power)	Global Conflict Risk Index (Probability for Highly Violent Conflict, log)	
			Global Conflict Risk Index (Probability for Violent Conflict)	

Source: Marin-Ferrer (2017)

The risk level assigned to the human hazard component of Inform for our assessment is described in Table 4.

Table 4 Risk levels for the Inform component human hazard

Score	Risk level	Inform – human hazard
1	Low	0 to 2.49
2	Medium	2.5 to 4.99
3	High	5 to 6.99
4	Very high	7 to 10

In addition to the Inform component, we added two indices related to conflicts.

1. The **Fragile State Index** ⁽⁶¹⁾, developed by the Fund for Peace, an independent non-profit organisation. It defines fragility using 12 indicators relating to internal cohesion, the economy, politics, cross-cutting factors including demographic pressures, refugees and internally displaced persons, and external intervention. Applied risk levels are shown in Table 5.

Table 5 Risk levels for the Fragile State Index

Score	Risk level	Fragile State Index
1	Low	< 30
2	Medium	31 to 60
3	High	61 to 90
4	Very high	> 90

⁽⁶¹⁾ Fund for Peace (2019).

- The **GPI** ⁽⁶²⁾, produced by the Institute for Economics & Peace, which ranks 163 independent states and territories according to their level of peacefulness. The GPI measures the state of peace using three thematic domains: the level of societal safety and security; the extent of ongoing domestic and international conflict; and the degree of militarisation. Applied risk levels are shown in Table 6.

Table 6 Risk levels for the Global Peace Index

Score	Risk level	Global Peace Index
1	Low	< 2.00
2	Medium	2.01 to 2.29
3	High	2.30 to 2.80
4	Very high	> 2.80

Human rights and social risks

Social impacts strongly depend on the local context where goods are produced and the raw materials are extracted. Indeed, in some regions, cultural and local working conditions can be not compliant with the International Labour Organization (ILO) conventions and human rights. Furthermore, social impacts are also strongly related to companies' behaviour and can be positive and negative. Workers, local community, supply chain actors and society are the main stakeholder categories used in literature and recommended by the guidelines for S-LCA ⁽⁶³⁾.

Several databases on social conditions are available in the literature, from the World Bank, the ILO, Unicef, EcoVadis ⁽⁶⁴⁾ and Maplecroft ⁽⁶⁵⁾, as well as the Social Hotspot Database ⁽⁶⁶⁾ and PSILCA ⁽⁶⁷⁾. Most of them include data on social aspects related to welfare of local communities and refer to ILO conventions. The most common risk categories are child labour, forced labour, fair salary, discrimination, social benefits and so on. Most of these databases have data only at country or regional level, such as the ILO, Maplecroft and World Bank databases.

In this analysis, we choose PSILCA as a data source for two risk categories: child labour and fair salary. PSILCA is a repository of data for S-LCA developed by GreenDelta GmbH. It provides information on social aspects of countries and sectors in a wide range of social categories, using internationally recognised data sources. For each data point provided in PSILCA, a data quality assessment and a risk evaluation (based on documented risk assessment schemes) are provided.

The categories and indicators chosen from the PSILCA set and considered most relevant for this analysis are the following:

- child labour, country-based data on children in employment, based on data from the World Bank ⁽⁶⁸⁾,
- fair salary, country- and sector-based data on wages (for the mining sector), retrieved from ILOStat 2014.

For these indicators, we used the risk levels provided by PSILCA, which are transparently documented in the database documentation ⁽⁶⁹⁾ and in Annex 1 of this report. Other relevant indicators on, for example, health and safety or bargaining rights, were not included because of insufficient coverage or low data quality.

In addition, the analysis includes an indicator on forced labour, using country-based data from the Global Slavery Index ⁽⁷⁰⁾, an independent assessment of modern slavery in the world. Risk levels assigned here are based on forced labour prevalence and government response (see Table 7).

⁽⁶²⁾ Institute for Economics & Peace (2019).

⁽⁶³⁾ UNEP/SETAC Life Cycle Initiative (2009).

⁽⁶⁴⁾ <https://www.ecovadis.com/>.

⁽⁶⁵⁾ <https://www.maplecroft.com/>.

⁽⁶⁶⁾ Benoit-Norris et al. (2012).

⁽⁶⁷⁾ Eisfeldt (2017).

⁽⁶⁸⁾ <https://info.worldbank.org/governance/wgi/>.

⁽⁶⁹⁾ Ciroth and Eisfeldt (2017).

The risk levels have been assessed considering the quartiles of the values assigned to each country in the two components prevalence and government response.

Table 7 Risk levels assigned to forced labour indicators

Quartile	Prevalence (victims per 1 000 population)	Government response (score)	Risk level
First	0.3–2.2	58 to 80	Low
Second	2.3–4.1	42.9 to 57.9	Medium
Third	4.2–6.9	42.8 to 31	High
Fourth	7.0–104.6	30.6 to – 7.4	Very high

Child labour and forced labour are listed in Annex 2 of the OECD Guidance as relevant aspects to be taken into account in responsible mineral supply chains. Salaries, in contrast, are not included in most of the responsible sourcing guidelines, but are usually part of social sustainability frameworks and sustainability reporting, e.g. S-LCA and the GRI.

Environmental risk

Responsible sourcing is usually related to avoiding human rights abuses and other social impacts occurring in the materials' extraction. However, environmental management also has a prominent role for responsible sourcing. Indeed, environmental impacts can entail serious health impacts on local communities and can compromise livelihoods of indigenous populations⁽⁷¹⁾. In particular, water-related risks play a major role and contribute to political instability, violent conflict, human displacement and migration, and acute food insecurity⁽⁷²⁾. Given the fact that material extraction and processing are highly water-intensive economic activities, water risk is a very important aspect to include in a hotspot analysis.

In order to take environmental aspects into account in the hotspot analysis, we selected two country-based indices.

1. The **Environmental Performance Index (EPI)**⁽⁷³⁾, produced jointly by Yale University and Columbia University in collaboration with the World Economic Forum. The EPI ranks 180 countries on 24 performance indicators across 10 issue categories covering the two components environmental health and ecosystem vitality. These metrics provide a gauge at a national scale of how close countries are to established environmental policy goals⁽⁷⁴⁾. The scale used by the EPI goes from 0 (worst performance) to 100 (best performance).
2. The **Water Risk Index (WRI)**, developed by the World Resources Institute. This composite index aggregates 12 indicators, using a combination of publicly available datasets and modelling techniques. The components of water risk are (i) physical risk – quantity; (ii) physical risk – quality; (iii) regulatory and reputational risk. The results are shown in the Aqueduct Water Risk Atlas (Aqueduct)⁽⁷⁵⁾, a publicly available global database and interactive tool that maps indicators of water-related risks. Aqueduct enables comparison across large geographies to identify regions or assets deserving closer attention⁽⁷⁶⁾. Values of the WRI range from 0 (lowest risk) to 5 (highest risk).

In this assessment, the values of the EPI and WRI have been translated into risk levels according to the framework shown in Table 8.

⁽⁷⁰⁾ <https://www.globallslaveryindex.org/>.

⁽⁷¹⁾ Mancini and Sala (2018).

⁽⁷²⁾ Gleick and Iceland (2018).

⁽⁷³⁾ <https://epi.envirocenter.yale.edu/>.

⁽⁷⁴⁾ Wendling et al. (2020).

⁽⁷⁵⁾ <https://www.wri.org/aqueduct>.

⁽⁷⁶⁾ Gassert et al. (2014).

Table 8 Risk levels applied to the EPI and WRI

Score	Risk level	Environmental Performance Index	Water Risk Index
1	Low	100 to 75	0 to 1.25
2	Medium	74 to 50	1.26 to 2.5
3	High	49 to 25	2.51 to 3.75
4	Very high	24 to 0	3.76 to 5

Conflict over the use of natural resources

In mining communities, conflicts and social tensions can arise from the inequitable distribution of benefits and costs or to the limited access to resources for the indigenous population. Similarly, industrial sites for processing or manufacturing the material can face the opposition of local communities, which experience environmental contamination, compromised access to water supplies and consequent health impacts. Events such as these are described in the Environmental Justice Atlas ⁽⁷⁷⁾, a tool documenting and systematising information about conflicts and struggles over the exploitation of natural resources and the related production processes. The tool was set up and is managed by the Universitat Autònoma de Barcelona, Spain. It started in 2012 with funding from the seventh framework programme for research on ‘Science in Society’ for the Environmental Justice Organisations, Liabilities and Trade project ⁽⁷⁸⁾.

The EJ Atlas is an online database and interactive map documenting socioenvironmental conflicts and mobilisations against particular economic activities whose environmental impacts are a key element of the grievance. The criteria applied for the identification of conflict cases are the following:

economic activity or legislation that has actual or potential negative environmental and social outcomes;

claims by environmental justice organisation(s) that such harm has occurred or is likely to occur as a result of this activity, and mobilisation;

reporting of that particular conflict in one or more media stories ⁽⁷⁹⁾.

The contents in the database are structured according to the form shown in Table 9. Therefore, for each documented conflict, a set of information is provided, including the commodities produced by a certain economic activity (e.g. mineral ore exploration, building material extraction, mineral processing, manufacturing activities), the intensity of the conflict, the related impacts and its duration.

⁽⁷⁷⁾ <https://ejatlas.org/>.

⁽⁷⁸⁾ <http://www.ejolt.org/>.

⁽⁷⁹⁾ Temper et al (2015).

Table 9 Main categories included in the EJ Atlas database form

Category	Detail
Basic data	Name of conflict Location and area Global positioning system coordinates and degree of accuracy Type of population involved (e.g. rural, urban)
Source of conflict	Type of conflict Commodities involved Description of conflict
Project details and actors	Level of investment Technical details Companies and state enterprises involved International and financial institutions involved Number of people affected Environmental justice organisation involved
The conflict and the mobilisation	Intensity History of mobilisation Groups mobilising (e.g. indigenous people) Forms of mobilisation Cross-involvement with other conflicts
Environmental impacts	E.g. deforestation, mine tailings spills
Health impacts	E.g. accidents, malnutrition
Socioeconomic impacts	E.g. increase in corruption, loss of livelihood
Outcome	Current status Conflict outcome (e.g. repression) Proposal of alternatives Perception of success
Source and material	Relevant legislation Academic sources Journalistic sources Multimedia sources
Contributor data	Author contact information Contact of local activists Other comments
Multimedia	Upload of relevant photos, video, PDFs, etc.

Source: EJ Atlas

The database allows browsing and filtering of the information according to various criteria, e.g. country, commodity, type of industrial activity.

In order to explore the conflicts related to the batteries supply chain, we first filtered the data using the category 'mineral ores and building materials extraction'. This filter allows all the conflicts linked to the mining and quarrying sector to be visualised. This set was further refined, selecting only the cases where materials used in batteries (i.e. cobalt, lithium, nickel, manganese, natural graphite) were involved and mentioned in the 'specific commodities' field.

In a second search, we applied the filter 'industrial and utilities conflicts' in order to extract the cases of conflicts related to plants for smelting/processing and manufacturing battery materials.

The information provided in this database is considered important for a responsible sourcing analysis. First of all, this kind of information can give hints of the social acceptance that production processes receive in the territories

where they operate. Moreover, countries experiencing high frequency of conflicts related to certain commodities could be considered at higher risk in a responsible sourcing analysis and deserving of further investigation. Listing cases of struggles, demonstrations and conflict reported by organisations, activists and media, the EJ Atlas provides bottom-up information, which can complement the results of the top-down indicators used in the hotspot analysis.

Given the qualitative nature of this information, the risk of environmental conflicts is not included in the hotspot analysis, but insights from the EJ Atlas are included in the interpretation of the results.

2.2. Results of the hotspots analysis

Table 10 shows the results of the hotspot analysis and the relevant countries that have a role as global suppliers or as EU suppliers, or have a high proportion of reserves and resources, for cobalt, lithium, nickel, manganese and natural graphite. We selected countries with at least 10 % in one (or more) of these categories.

Table 10 Hotspots analysis results for battery materials

Material	Country	Materials supply (mining stage)			Governance		Conflicts			Human and social rights			Environment	
		% reserves and resources	% global mining production	% EU sourcing	Resource Governance Index	Worldwide Governance Indicators	INFORM - HH	Fragile State Index	Global Peace Index	Child labour*	Fair salary*	Global Slavery Index	Environmental Performance Index	Water Risk Index
COBALT	Australia	10	4	1	1	1	1	1	1	1	1	1	2	3
	Congo DR	46	57	69	3	4	4	4	4	4	2	4	3	1
	Finland	1	1	14	n.a.	1	1	1	1	1	1	1	1	1
LITHIUM	Argentina	20	12	5	n.a.	2.5	1	2	1	2	1	1	2	2
	Australia	8	36	65	1	1	1	1	1	1	1	1	2	3
	Bolivia	21	0	0	n.a.	3	3	3	2	4	3	2	2	1
	Chile	12	38	0	1	2	2	2	1	2	1	1	2	3
	Portugal	0	0	10	n.a.	2	1	1	1	2	2	2	2	3
	USA	13	3	0	1	1.3	3	2	3	1	1	1	2	2
MANGANESE	Australia	14	17	1	1	1	1	1	1	1	1	1	2	3
	Brazil	1	7	17	n.a.	3	3	3	2	2	1	1	2	1
	China	2	17	0	n.a.	3	3	3	2	3	2	2.5	2	3
	Gabon	10	10	20	n.a.	3	3	3	2	4	1	3.5	3	1
	South Africa	41	28	25	2	2.5	3	3	3	n.a.	1	2	3	3
	USA	10	0	0	1	1.3	3	2	3	1	1	1	2	2
NATURAL GRAPHITE	Brazil	1	7	12	n.a.	3	3	3	2	2	1	1	2	1
	China	0	64	47	n.a.	3	3	3	2	3	2	2.5	2	3
	India	0	11	0	n.a.	2.5	3	3	3	1	2	2.5	3	3
	Mozambique	68	0	0	n.a.	3	2	3	2	4	1	3	3	2
	Tanzania	13	0	0	2	3	2	3	1	4	1	3	3	3
NICKEL	Australia	13	11	0	1	1	1	1	1	1	1	1	2	3
	Canada	7	10	7	n.a.	1	1	1	1	1	1	1	2	1
	China	3	4	47	n.a.	3	3	3	2	3	2	2.5	2	3
	Greece	1	1	10	n.a.	2.5	2	2	1	1	1	3	2	3
	Indonesia	17	18	0	1	3	3	3	1	2	1	2.5	3	3
	Philippines	10	17	0	2	3	4	3	3	2	3	3	2	3
	Russian Federation	11	11	0	n.a.	3	3	3	4	2	1	3.5	2	1
	South Africa	4	2	14	2	2.5	3	3	3	n.a.	1	2	3	3

1, low risk; 2, medium risk; 3, high risk; 4, very high risk. n.a. not available

(*) Risk levels provided by PSILCA database. Numbers in *italics* in the child labour category mean that original estimates are older than 2010 (China 2009, Mozambique 2007).

2.3. Interpretation of the results

Analysing the risk indicators individually, we find that the DRC has the lowest levels of governance and the highest risk of conflict, child labour and forced labour. Several countries, including Brazil, Russia, India, China and South Africa (the BRICS), have high risk scores for governance. Unfortunately, many data gaps exist for the governance of natural resources (RGI). Concerning conflict, the DRC and the Philippines have very high risk levels, while for several other countries (including the BRICS) the risk level is high. Concerning the last two columns of Figure 5, on environmental aspects, Gabon, South Africa, Indonesia and the DRC have the lowest environmental performances. High water risk affects many countries, including important material providers such as Australia, Chile and some European countries (Greece and Portugal).

Looking at the results by country, we can identify four groups, based on their average risk scores (Table 11) as described below (also illustrated in Figure 5).

Table 11 Average risk score of the main players in the production of battery materials (mining stage)

Country	Average risk score	Cobalt	Lithium	Manganese	Natural graphite	Nickel
DRC	3.30	x				
Philippines	2.77					x
China	2.61	x	x	x	x	x
Gabon	2.61			x		
India	2.56				x	
South Africa	2.50			x		x
Mozambique	2.50				x	
Tanzania	2.50				x	
Russia	2.50	x				x
Bolivia	2.44		x			
Indonesia	2.22					x
Brazil	2.00			x	x	x
Greece	1.94					x
United States	1.73		x	x		
Portugal	1.72		x			
Argentina	1.61		x			
Chile	1.60		x			
Australia	1.30	x	x	x		x

x, global production, EU sourcing or reserves and resources is higher than 5 %.

- **Countries at highest risk**

These countries have the highest average risk scores: 3.30 (DRC) and 2.77 (Philippines). The average risk score for a country is calculated as the average of the scores for each risk category ⁽⁸⁰⁾.

The **Democratic Republic of the Congo** is the main global producer of cobalt. It also owns 46 % of global reserves and resources of this material and provides 69 % of EU sourcing. Moreover, DRC cobalt is contained in intermediate products and manufactured goods produced in China that are likely to be imported into the EU. Very

⁽⁸⁰⁾ The weights assigned to each component (governance, conflict, environmental performance and water risk) are equal. Aggregating the scores in different ways, or applying different cut-off criteria in the material supply data, can produce changes in the interpretation of the results, which are discussed in Annex 1.

high risks emerge in terms of conflicts, governance, child and forced labour, while risk to the environmental performance is high. Conflicts related to cobalt extraction (together with coltan, gold and other materials) are also reported by the EJ Atlas.

The **Philippines** produces 17 % of the global nickel supply and 10 % of global reserves and resources (but does not provide any nickel to the EU). It is characterised by very high risk of internal conflicts and high water risk. The EJ Atlas reports 12 conflicts related to nickel extraction in this country, happening since 1993. Environmental degradation is often pointed to as the main cause of conflicts in the Philippines, together with land competition, disputes over the use of ancestral lands and other conflicts with indigenous communities. In most cases, these conflicts relate to the extraction of nickel and other materials (especially cobalt and other materials classified as rare metals in the EJ Atlas database).

- ***Countries providing the EU with several materials for batteries***

This group includes important EU suppliers of one or more materials for batteries. China has the highest risk level (2.61), followed by South Africa and Russia (2.5), and then Brazil (2.0).

China provides 47 % of the EU's supplies of both natural graphite and nickel, 17 % of global production of manganese and 7 % of the global lithium supply (not shown in Figure 5, which applies a cut-off criterion of 10 %). It presents a high risk of conflicts, weak governance and high water risk. The number of environmental conflicts linked to the battery supply chain is the highest among the countries under consideration (14, according to the EJ Atlas). Most of them concern the smelting industry and the battery-manufacturing sector. Underlying reasons for these conflicts concern mainly lead pollution affecting the local communities' health.

South Africa is an important supplier of manganese and nickel to the EU (respectively 26 % and 14 %). It also owns a significant proportion of reserves and resources of manganese (41 %) and of the global supply (28 %). It is characterised by a high risk for the two environmental indicators, but also a high risk of internal conflicts. Conflicts reported in the EJ Atlas concern other materials (e.g. platinum, sand and asbestos) than those used in batteries.

Russia provides 11 % of the global nickel supply and 5 % of the EU's supply of cobalt (not shown in Figure 5, which includes only shares above 10 %). The main risks concern conflicts and low levels of governance. Two conflicts in nickel and cobalt extraction sites are reported by the EJ Atlas, one of them occurring in the Arctic area and caused by high pollution levels.

Brazil provides the EU with manganese, natural graphite and nickel (respectively 17 %, 12 % and 4 %). It has weak governance and a high risk of internal conflicts. Several conflicts are reported by the EJ Atlas in this country (27 in total), in many cases due to struggles with indigenous communities. Two conflicts are related to battery materials (nickel and manganese).

- ***Countries at risk regarding future material provision***

This group includes countries with high proportions of global reserves and resources for battery materials, which could therefore become important suppliers of battery materials in the future. Their risk scores range from 2.61 (Gabon) to 2.20 (Indonesia).

Gabon is an important supplier of manganese, and owns 10 % of the total reserves and resources of this material. Child labour is the category presenting the highest risk for this country, while worldwide governance, environmental performance and two indices related to conflicts (the Inform component and the Fragile State Index) have high risk levels. The EJ Atlas reports one conflict related to iron ore and another related to uranium.

Tanzania's average risk score is 2.5. It has high risk scores for environmental performance and water risk (EPI and WRI). Governance risk is also high, while the risk level for the resource governance index is medium. Environmental conflicts reported in this country and related to mining are not linked to materials for batteries (they concern gold and uranium extraction). The country has 13 % of the world reserves and resources of natural graphite.

Mozambique has 68 % of global reserves and resources of natural graphite, and has weak governance and low environmental performance. The EJ Atlas does not report any conflict related to the mining sector ⁽⁸¹⁾. Its average risk score is 2.5.

Bolivia has 21 % of global reserves and resources of lithium, and has weak governance and high risk of conflicts for one of the indicators. The average risk score is 2.44. Only one conflict linked to lithium extraction is reported in the EJ Atlas, but many other conflicts have occurred in mining sites for other commodities, especially gold, silver and copper. As according to official statistics the actual production of lithium is negligible ⁽⁸²⁾, the development of the lithium extraction sector could drive a surge in other conflicts, as has happened for other materials.

Indonesia, despite its good level of governance in the extractive sector as assessed by the RGI, has high risk levels for all the other governance components. Indonesia is a global supplier of nickel and owns 17 % of the global reserves and resources of this material. The EJ Atlas describes nine conflicts related to the mining sector. One of them, classified as of high intensity, was between the nickel production activity of the Vale company and indigenous communities.

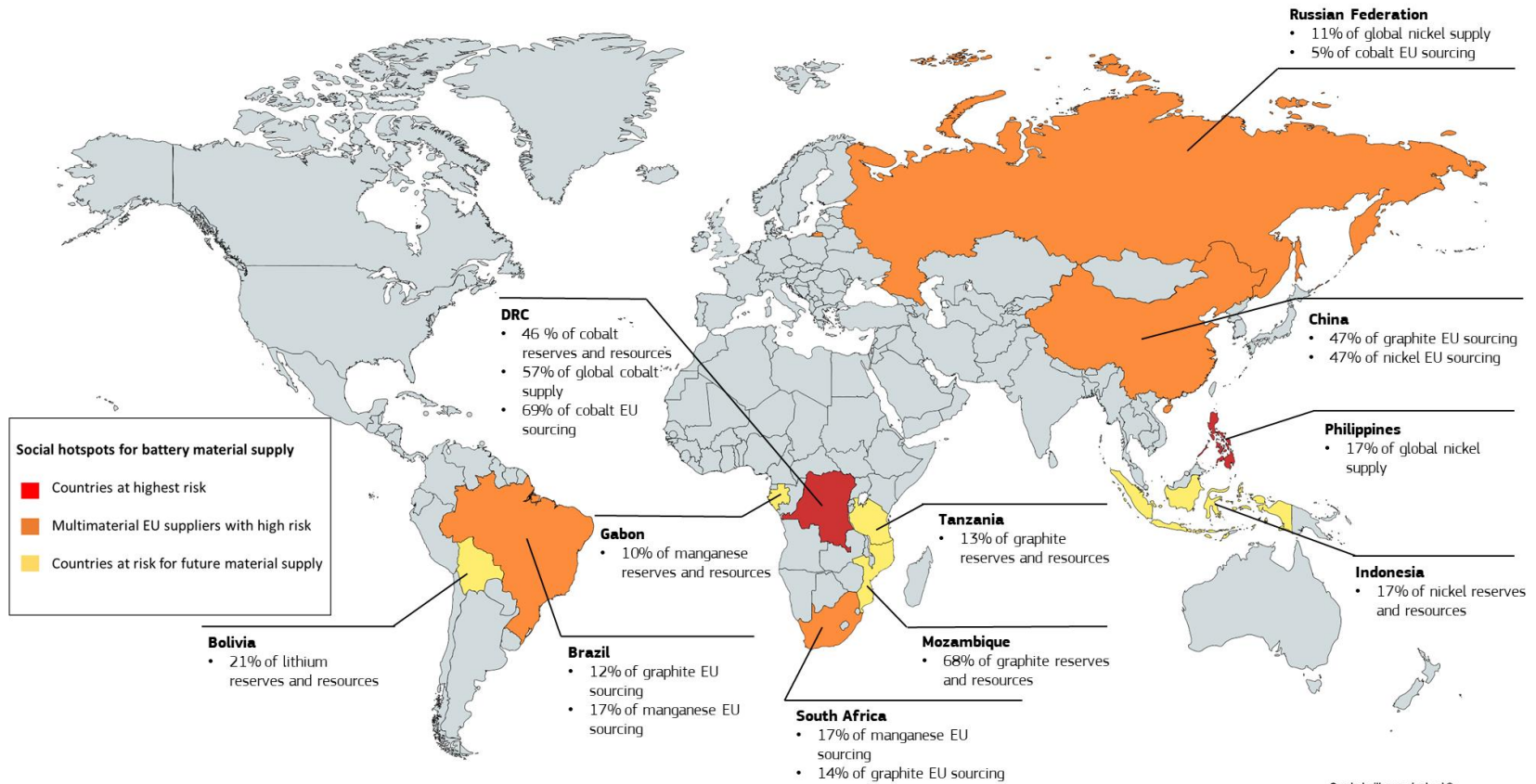
- **Others**

India has a peculiar role and does not fit any of the above clusters. The average risk score of this country is quite high (2.56), with low performance in the environmental and water risk indicators as well as in the conflict ones. The EJ Atlas documents more than 30 conflicts related to the mining sector, and especially related to illegal sand extraction, iron ore plants, quarries and other materials that are not those included in this analysis and used in batteries. The country produces 11 % of the global supply of graphite and 5 % of global manganese supply.

⁽⁸¹⁾ As mentioned in the description of the methodology, the fact that the EJ Atlas is community driven could imply under-representation of conflicts in developing countries. For instance, several cases of human rights abuses in the gemstone-mining sector are reported; see Cronje (2019).

⁽⁸²⁾ USGS (2019).

Figure 5 Hotspots in the production of battery materials, considering mining stage



2.4. Main findings of the chapter

As has emerged in previous studies, the mining sector has a key role in contributing to or hindering sustainable development⁽⁸³⁾. According to a review study, land-use-related impacts, environmental impacts affecting human health and human rights appear to be the most concerning social aspects in the mining sector⁽⁸⁴⁾.

In recent years, many studies and news stories have described serious human rights abuses linked to the extraction of cobalt in the DRC. Less is known about social impacts in the extraction phase of other materials used in batteries.

The objective of this chapter was to screen potential hotspots in the battery materials' mining phase, using open-source country-based information on aspects relevant to responsible sourcing and available statistics on raw material production, reserves and resources. We also used the indicator 'EU sourcing', which adds EU domestic production to imports of raw materials at mining stage, in order to represent the importance of countries as EU suppliers (even though materials imported in components and semi-finished products are not considered in this analysis). Hotspots were detected considering both the countries' performances for the selected indicators and their roles as material suppliers.

The hotspot analysis results confirm that the DRC is, by far, the country at highest risk, especially concerning conflict, child labour, forced labour and governance. However, the Philippines, which supply nickel and natural graphite, also have a high average risk score. Another cluster of countries was identified as being at lower risk than the first group but having important roles as EU suppliers. Indeed, each of these countries provides various materials to the EU (and other materials relevant to other low-carbon technologies, e.g. rare earths and platinum group metals). The common factors of these countries are the high risk in the WGI indicators average and in the indicators on conflicts. In the case of South Africa, environmental performance and water stress also appear critical, while for Brazil conflicts with the indigenous communities are an issue of concern. The third group of countries could have a role in future materials supply, as they own high proportions of global reserves and resources of materials used in batteries. For instance, with 68 % of global reserves and resources, Mozambique could compete with China as a graphite supplier in the near future. Bolivia could also become a key player in lithium supply, as could Gabon for manganese. These three countries show high risk levels for child labour.

Given the nature of the data used in this hotspot analysis, the results should be considered only a rough assessment of potential risks to the responsible supply of materials for batteries. Indeed, uncertainty behind each data point can be high, especially in child labour estimates provided by the World Bank, some of which are older than 2010⁽⁸⁵⁾. Moreover, country-based indicators and indices are appropriate for communication and global comparisons, but regional (interstate) differences can be very significant, especially in big countries. For instance, the area of production of cobalt in the DRC is not affected by conflicts, as in the case of 3TGs area of production. Geopolitical situations can change very rapidly and some conflicts that occurred in the last few months (in Bolivia, Chile, etc.) are not captured in this analysis.

The analysis, however, is a useful exercise to screen country-material combinations that could be critical from a responsible sourcing perspective. In the next chapter, a more detailed analysis scrutinises the social performance of the main mining companies that produce materials for batteries, using as data sources their publicly available sustainability reports.

⁽⁸³⁾ Mancini et al. (2019).

⁽⁸⁴⁾ Mancini and Sala (2018).

⁽⁸⁵⁾ In Figure 5, when data are older than 2010, risk values are in italics.

3. Corporate-level social data disclosure

Sustainability data disclosure is an important tool for ensuring transparency and promoting responsible business conduct. As described in the Raw Materials Scoreboard 2018, the number of companies publishing sustainability reports has increased in the last decade. This indicator is also used to monitor progress towards the UN Sustainable Development Goals (SDGs)⁸⁶. Within this framework, target 12.6 is to 'Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle'.

In 2014, the EU issued Directive 2014/95/EU, requiring large companies to disclose certain information regarding the way they operate and manage social and environmental challenges. Non-binding guidelines on non-financial reporting were also developed and published in 2017 to better define the information that should be disclosed in non-financial reporting and how to report this information in a consistent and comparable way (COM/2017/4234). The guidelines specify some key principles for the disclosure of non-financial information. For instance, they specify the importance of assessing the materiality of the information, i.e. its relevance in the context under investigation. Disclosed information should allow the 'understanding of the undertaking developments, performance, position and impact of its activity' ⁽⁸⁷⁾. Companies are asked to consider the actual and potential severity and frequency of impacts related to their products, services and related supply chains. Moreover, information must be assessed in a context that takes into account sectoral considerations and the expectations of relevant stakeholders (which may include, among others, workers, investors, consumers, suppliers, customers, local communities, public authorities and civil society). The guidelines provide a list of thematic aspects to be addressed in a sustainability report. These include:

- environmental issues,
- social and employee issues,
- respect of human rights,
- anti-corruption and bribery issues,
- others (supply chain, conflict minerals).

Social and labour matters include the following aspects:

1. implementation of fundamental conventions of the ILO,
2. diversity issues, such as gender diversity and equal treatment in employment and occupation regarding age, gender, sexual orientation, religion, disability, ethnic origin and other relevant aspects,
3. labour issues, including employee consultation and/or participation, employment and working conditions,
4. free association and collective bargaining rights, including respect of trade union rights,
5. human capital management including management of restructuring, career management and employability, remuneration system, holidays, training,
6. occupational health and safety,
7. consumer relations, including consumer satisfaction, accessibility, products with possible effects on consumers' health and safety,
8. impacts on vulnerable consumers,
9. responsible marketing and research,
10. community relations, including social and economic development of local communities.

The S-LCA methodology, introduced in the previous chapter, also offers a framework of stakeholders and related impact categories to take into account when assessing social impacts. According to the definition of S-LCA, we can measure positive and negative impacts if we can measure the difference between the current local

⁽⁸⁶⁾ UN 2015

⁽⁸⁷⁾ Directive 2014/95/EU, article 1

conditions and the hotspot analysis performed with generic data. Unlike the environmental life-cycle assessment, today no database is available at company or product level with primary data collected for S-LCA subcategories. However, corporate social responsibility data are produced and available through several schemes such as the GRI and databases on environmental, social and governance issues, such as Ecovadis© and Sedex©. These tools are currently used by companies looking to reduce their social impact and risk.

To understand what are the main impacts reported by the companies, and the level of public knowledge on the main producers of battery materials, a screening of their sustainability reports has been done and the main results are reported in the following sections. The detailed list of information published by each company is reported in Annex 2. Assessing the social impacts at company level is important in order to have more detailed information than the country level of the hotspot analysis presented in the previous chapter. In fact, a country/sector assessment delivers only an overview of the possible main social risks, but national-level risks do not necessarily result in negative impacts at the project/product level. Indeed, as was mentioned before, if a company working in a high-risk country implements appropriate policies, it has the potential to improve local conditions and create positive changes, resulting in positive social impacts.

3.1. Methodology

The methodology developed for this chapter first required the identification of the main players in the global battery material supply chain for the materials considered in this study: cobalt, lithium, manganese, natural graphite and nickel. Niobium, which has shown vast potential in new battery technologies, is also included in this chapter.

The website and sustainability reports of each company have been screened and all information useful to assess the subcategories of an S-LCA has been collected. In particular, we looked at the nature of the information provided, if goals and targets are established and assessed through quantitative indicators, and if changes from the past years are monitored. The social issues considered are those reported in the guidelines and methodological sheets for S-LCA ⁽⁸⁸⁾ and in the Handbook of Product Social Impact Assessment ⁽⁸⁹⁾. The focus of the company was mainly on the stakeholder categories workers and local communities. The sustainability reports have been considered first; as an alternative the company website was scrutinised. In the sustainability reports, the presence of further aspects has been assessed, such as:

defined sustainability strategy and goals,

quantitative targets,

integration of SDGs and measurement of the company's contribution in relation to them,

type of social data published at worker and local community levels.

3.2. Analysis

The analysis of the sustainability disclosures from companies shows that the most prominent impact categories are health and safety, wages, gender balance, benefits for workers, type of contracts, investments and activities done for the local communities and these investments' and activities' impact on those communities, and taxes, royalties or contribution to the national revenue of host governments.

Table 12 summarises the main outcomes of the analysis, and Annex 2 contains detailed information for each material.

Out of the 14 companies assessed, 10 have a sustainability policy (a policy that describes which areas/topics are relevant to the company, on which area efforts will focus and if it has established specific targets) and 8 companies published a sustainability report for 2018. Sustainability goals are mentioned by most companies, but only four companies take into account the UN SDGs and only two establish measurable targets. The kind of information most frequently disclosed concerns health and safety (nine companies), activities promoted in local communities (eight), gender balance (seven) and data on taxes or royalties paid in host countries (seven).

⁽⁸⁸⁾ UNEP/SETAC Life Cycle Initiative (2009); UNEP/SETAC Life Cycle Initiative (2013).

⁽⁸⁹⁾ PRè Sustainability (2016).

Data on wages are reported by only two companies, and only four companies present information on impacts on local communities. Five companies disclose information on benefits provided to workers and type of contract. The most complete reports are published by big companies with already existing and underlying sustainability strategies.

Data often mainly focus on the health and safety aspects, including data on fatalities, injuries or lost-time injury rates. This indicator can show a positive impact only if a positive trend in reduction is measurable over several years. However, often the severity of the accidents or diseases is not specified. Another opportunity to understand the social impact value is comparing it with the average for that specific sector. Other published data are often related to gender composition of the workforce and the percentage of women in management roles.

EU guidelines for sustainability reporting recommend independent external assurance in order to publish more accurate and balanced information, thus allowing a clearer distinction between views and interpretations. Yet only 4 out of the 14 companies assessed provide third-party assurance of the content of the report; the others rely on internal auditing systems.

Table 12 List of social aspects addressed in the sustainability reports of the selected companies

Material	Cobalt	Graphite			Lithium				Manganese	Nickel		
Company	Glencore	China Carbon Graphite Group	Graphite India Ltd	South Star Mining Corp	Talison Lithium Inc.	SQM	Albemarle Cooperation	Orocobre	South32	VALE	VALE Indonesia	BHP Billiton
Sustainability policy	n.a.	n.a.	n.a.	n.a.	√	√	√	√	√	√	√	√
Sustainability report	√	n.a.	n.a.	n.a.	n.a.	√	√	√	n.a.	√	√	√
Independent audit	selected aspects	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	√	n.a.	√
Consideration of SDGs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	√	√	√	√
Sustainability goals	√	n.a.	n.a.	n.a.	n.a.	√	√	√	n.a.	√	√	√
Quantitative sustainability targets	√	n.a.	n.a.	n.a.	n.a.	√	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Data on Health and Safety*	√	n.a.	√	n.a.	n.a.	√	√	√	n.a.	√	√	√
Data on wages*	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	√	√	n.a.	n.a.	n.a.	n.a.
Data on gender balance*	n.a.	n.a.	n.a.	n.a.	n.a.	√	√	√	n.a.	√	√	√
Data on benefits for workers*	n.a.	n.a.	n.a.	n.a.	n.a.	√	√	√	n.a.	n.a.	√	n.a.
Data on type of contracts (time limited, open ended)*	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	√	√	n.a.	√	n.a.	√
Data on impacts on local community*	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	√	√	√
Data on activities on local communities*	√	n.a.	n.a.	n.a.	n.a.	n.a.	√	√	√	√	√	√
Data on taxes, royalties, contribution to national revenue	√	n.a.	n.a.	n.a.	n.a.	√	n.a.	√	√	√	√	√

(*) Categories included in the EU Guidelines. (n.a.) not available

3.2.1. Cobalt

Glencore is the world's largest cobalt-mining company, achieving total production of 46 300 tonnes in 2018 ⁽⁹⁰⁾. Most of its production is as a by-product of copper mining in the DRC, and also as a by-product of nickel mining in Australia and Canada. Glencore is also one of the largest recyclers and processors of cobalt-bearing materials, such as used batteries.

Given the location of its operations, the main risks the company faces according to the hotspot analysis (Chapter 2) relate to weak governance, conflicts, child labour and forced labour. The EPI also has a high risk level, as does the RGI. Given these criticalities and the difficult context, more information on staff management systems and workers' rights and conditions in its DRC operations should be measured and declared by Glencore. Indeed, most of the indicators measured and disclosed in the sustainability report are not specific to the DRC operations but relate to the whole set of copper operations (including Australia, Canada and elsewhere). Moreover, the report mentions some activities to support local communities in the DRC, but does not disclose the share of investment spent in that region (see Annex 2 for more details).

3.2.2. Graphite

Natural graphite is also extracted in areas of high risk regarding child labour issues: Mozambique and Tanzania among others (see Chapter 2). Other countries where this material is produced present high risks in the governance and conflict category (Brazil, China).

Focusing on the main graphite miners in the countries singled out during the hotspot analysis yields a list of three players: China Carbon Graphite Group (China), Graphite India Ltd (India) and South Star Mining Corp (Brazil). Compared with other battery materials, awareness of social and environmental issues seems lower, as none of the three main producers has published a sustainability report.

3.2.3. Lithium

Lithium mining in Bolivia, which holds a fifth of the world reserves known to date, is also undertaken in a context of high risk in regard to child labour and fair compensation. Production has not yet started in Bolivia so imports of Bolivian lithium products into the EU have not taken place.

The companies assessed operate in other countries (Argentina, Australia, Chile and the USA) and are among the most prolific companies of the selected sample in regard to the information they share (see Annex 2 for details **Errore. L'origine riferimento non è stata trovata.**), which includes specific data on injuries, gender ratios, workers' benefits and community relations (see Annex 2 for details).

3.2.4. Manganese

In the case of manganese, data have been collected on one company located in South Africa, the world's biggest manganese-producing country, which is a significant player in that country and has operations in Australia: South32.

The company, while not publicly releasing a sustainability report, provides information on a number of its activities through its website, which explains how the company contributes to the SDGs ⁽⁹¹⁾ and the company's approach to community, health, safety and the environment, as well as forced labour ⁽⁹²⁾. However, very few measurable targets are presented; for instance, partial information is provided on certain social aspects, such as gender balance (at company level, so for all locations). Environmental and water risk are critical in the South African context according to the hotspot analysis presented in Chapter 2 and, while the company addresses

⁽⁹⁰⁾ Information reported on the Glencore website (<https://www.glencore.com/what-we-do/metals-and-minerals/cobalt>, accessed in March 2020). It is not specified which cobalt product(s) it refers to (cobalt hydroxide, metal or both).

⁽⁹¹⁾ <https://www.south32.net/who-we-are/sustainability-approach/sustainable-development-goals>.

⁽⁹²⁾ https://www.south32.net/docs/default-source/sustainability-reporting/fy2019-sustainability-reporting/hsec-management-approaches-2019.pdf?sfvrsn=ae3490f9_2.

water-related aspects in a dedicated report, this does not provide information specifically about manganese but instead focuses on the company's aluminium, alumina and coal operations.

The company also reports on social and governance indicators that are relevant to South African investors and regulators, such as the representation of black people in its South African workforce.

3.3. Main findings of the chapter

The analysis of company sustainability reports shows that there are high levels of discrepancy in the information disclosed at the company level. In most cases, the level of data disaggregation is very low and data are disclosed at the level of company or material produced (which means considering the overall performance of many operations running in various countries in the world). This can also create numerous data gaps, at least in communication materials. This discrepancy can be traced to the use of different data-reporting standards.

Among them, the EU's non-binding guidelines for non-financial reporting stress the importance of providing information that allows the assessment of impacts, and that has to be complemented by contextual information and points of reference, which are often neglected in sustainability reports.

Yet, as highlighted in the review, information is rarely contextualised to take into account the local project conditions, and at the same time it is rarely reported at the project level. This complicates the assessment of potential impacts. It is thus necessary to assess company-level data when taking the local operational context into consideration either through a tool such as the hotspot analysis or through dedicated site visits.

Moreover, while independent auditing is recommended by the aforementioned EU guidelines and by the vast majority of practitioners, it is implemented only by 4 out of the 14 companies in the selected sample. This third-party assurance of self-reported information is paramount to ensure that sustainability claims are not just whitewashing operations but disclose the true nature of the operations' impacts, and that the data disclosed are meaningful and allow a proper impact assessment.

A stricter policy on sustainability reporting, in particular concerning information on aspects critical in the country where the materials are produced, would make it possible to have more consistent and transparent information that could be used for impact assessment as well as in the context of sustainable finance. This would also make it possible to incentivise and support companies operating responsibly in critical social contexts and creating positive social impacts.

The analysis performed here could be done for other materials and products in a systematic procedure.

While this chapter focused on sustainability reporting, the next one deals with responsible sourcing. We present the main schemes and initiatives of interest to the battery sectors and especially for cobalt, which emerged as the most critical material from a social point of view in the previous chapters.

4. Responsible and sustainable supply of battery materials: review of the main initiatives and standards

The term ‘responsible sourcing’ has emerged in recent years in relation to conflict minerals (3TG). Media and NGOs reported on the role of these minerals in financing the armed actors taking part in the conflicts of the eastern DRC (after the formal end of the Second Congo War) and responsible for large-scale human rights abuses. However, much earlier, similar concerns in the diamonds sector led to the deployment of the Kimberley Process ⁽⁹³⁾ in 2000.

As shown in the previous chapter, sustainability assessing and reporting, using a variety of standards and frameworks, has also become a more common practice at the corporate level. One of these methodologies is S-LCA, which was developed in an academic context, and provides a framework of social impact categories that can be applied to any supply chain, product, service, etc.

Concerning the battery supply chain, nowadays, downstream industries are increasingly looking at ensuring a responsible supply of raw materials for their products, and especially for cobalt, pushed by a combination of perceived forthcoming regulatory demands, business-to-business demands and concern for any loss of brand value.

To date, these actors have relied principally on the implementation of due diligence practices aligned with the OECD Guidance. The guidance offers them a framework to undertake the due diligence required to evaluate whether or not their cobalt supply is free of problem cobalt sources, which a non-negligible number of downstream industries understand as being any cobalt with an ASM origin. Industry associations have supported the development of tools to facilitate cobalt due diligence, made efforts towards the validation of cobalt-processing refineries and developed frameworks for cobalt supply chain reporting and/or disclosure.

Further initiatives and projects promote transparency efforts or aim at the validation of cobalt-processing refineries by developing frameworks for more transparent reporting or disclosure of the company’s supply chains.

A few downstream actors have also chosen to engage directly with the sector in order to take part in the transformation of the cobalt ASM sector.

In this chapter, we review and briefly describe the main initiatives and standards on responsible and sustainable supply of minerals (and in particular of cobalt). The review is partially based on the work published in a report of the Horizon 2020 project Strategic Dialogue on Sustainable Raw Materials for Europe (Strade) ⁽⁹⁴⁾, but it also covers cobalt-related initiatives. It does not aim to be comprehensive, especially concerning the sustainability frameworks, but aims to provide an analysis of the risk categories included in the different frameworks, and to identify the elements defining the concept of sustainable supply as distinct from responsible sourcing.

4.1. Responsible sourcing frameworks and guidance

4.1.1. OECD due diligence guidance for responsible mineral supply chains

The OECD Guidance is a government-backed multistakeholder set of recommendations on responsible supply chain management that has become the underlying standard of a significant number of mineral certification schemes and audits, as well as of a number of companies’ corporate policies regarding mineral sourcing from CAHRAs. To date the OECD Guidance is arguably the most influential and widely recognised standard for responsible mineral sourcing; critically it is the guidance underpinning the EU Conflict Minerals Regulation ⁽⁹⁵⁾. The OECD Guidance is in its third edition, and now encompasses all minerals and CAHRAs.

The OECD Guidance provides a set of minimum standards and guidelines for companies to ensure that they do not finance conflict or human rights abuses through their mineral sourcing. It is a flexible five-step

⁽⁹³⁾ <https://www.kimberleyprocess.com>.

⁽⁹⁴⁾ Eslava (2018).

⁽⁹⁵⁾ Regulation 2017/821 of the European Parliament and of the Council of 17 May 2017 laying down supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas.

framework that can be adapted to the needs of any company. The OECD Guidance focuses on issues of human rights, provision of security, forced and child labour⁽⁹⁶⁾, legality of operations and payment of taxes.

The risks to be assessed in the minerals supply chain due diligence are:

1. serious abuses associated with the extraction, transport or trade of minerals,
2. torture, cruel, inhuman and degrading treatment,
3. forced or compulsory labour,
4. the worst forms of child labour,
5. other gross human rights violations and abuses such as widespread sexual violence,
6. war crimes or other serious violations of international humanitarian law, crimes against humanity or genocide,
7. direct or indirect support to non-state armed groups,
8. public or private security forces,
9. bribery and fraudulent misrepresentation of the origin of minerals,
10. money laundering,
11. issues related to the payment of taxes, fees and royalties due to governments.

4.1.2. International Finance Corporation's performance standards on environmental and social sustainability

The IFC PS are the part of the IFC's sustainability framework directed towards its clients. The IFC PS provide guidance on how to identify risks and impacts, and are designed to help avoid, mitigate and manage risks and impacts as a way of doing business sustainably. Their application is a requisite for IFC clients throughout the life of an IFC investment, and is imposed in order to manage environmental and social risks and impacts, and enhance development opportunities.

The IFC PS play an important role in regard to financing from donors or banks, as the Equator Principles⁹⁷ are based on them. The Equator Principles are applied to World Bank-financed projects, to publicly supported projects of OECD Member countries, and by all international private and public banks signatories to the Equator Principles.

In addition to the role they play with financiers, the IFC PS are, arguably, generally recognised as the most commonly benchmark for large-scale mining (LSM) risk characterisation and mitigation (complementary to the OECD Guidance).

This framework includes eight PS:

1. *assessment and management of environmental and social risks and impacts,*
2. *labour and working conditions,*
3. *resource efficiency and pollution prevention,*
4. *community health, safety and security,*
5. *land acquisition and involuntary resettlement,*
6. *biodiversity conservation and sustainable management of living natural resources,*
7. *indigenous peoples,*
8. *cultural heritage assessment and management of environmental and social risks and impacts.*

Each standard includes a certain number of aspects to be checked. The detailed list of objectives under each performance standard can be found in Annex 3.

⁽⁹⁶⁾ Further clarification for on how companies prevent, identify and mitigate risks of works forms of child labour based on the OECD Minerals Guidance is available at OECD (2017), Practical actions for companies to identify and address the worst forms of child labour in mineral supply chains.

⁽⁹⁷⁾ The Equator Principles (EPs) is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence and monitoring to support responsible risk decision-making.

4.1.3. China Chamber of Commerce of Metals, Minerals & Chemicals Importers and Exporters' Guidance

The China Chamber of Commerce of Metals, Minerals & Chemicals Importers and Exporters' (CCCCMC's) due diligence guidelines for responsible mineral supply chains (CCCCMC Guidance) also provide a set of minimum standards and guidelines to support companies' efforts to identify, prevent and mitigate the risks of directly or indirectly contributing to conflict or human rights abuses. Primarily based on the OECD Guidance as well as the UN Guiding Principles on Business and Human Rights, the CCCCCMC Guidance also includes a clearer focus on issues related to indigenous rights, pollution and biodiversity conservation, among others. These risks, which are not considered core OECD Guidance risks, are referred to as type 2 risks.

Type 1 denotes risks of contributing to conflict and serious human rights abuses associated with extracting, trading, processing and exporting of resources from CAHRAs. **Type 2** risks are associated with serious misconduct in environmental, social and ethical issues.

The detailed list of risks is in Annex 3.

While flexible in its minerals and applications, the CCCCCMC Guidance is currently focused on the 3TG and cobalt supply chains. Supported by the Chinese Ministry of Foreign Affairs, its ambition is to become the go-to standard for Chinese companies operating abroad and is therefore important to consider when preparing data collection templates.

4.1.4. Social life-cycle assessment

S-LCA⁽⁹⁸⁾ is an impact assessment technique used to capture the social impacts of goods and services at each step of their life cycles. This approach makes it possible to avoid shifting burdens between geographical areas or supply chain steps when evaluating impacts.

In the context of S-LCA, social impacts are defined as the consequences on human populations of any public or private action that alter the ways in which people live, work, play, relate to one another, organise themselves so as to meet their needs and generally cope as members of societies⁽⁹⁹⁾. Social impacts are therefore consequences of positive or negative pressures on social areas of protection (i.e. well-being of stakeholders). As a cause-effect chain is not well defined and a proper impact assessment method has not been developed yet, often the term 'social risk' is adopted. Social risk refers to the potential for one or more parties to be exposed to negative social conditions that, in turn, undermine social sustainability⁽¹⁰⁰⁾. Positive social impacts hidden in product supply chains are also taken into account in the S-LCA methodology, even though their theoretical definition and implementation in the methodology are still under debate.

Regarding this specific methodology, recognised internationally standards do not exist yet, but guidelines have been produced in the document 'Guidelines for social life cycle assessment of products' by the UNEP/SETAC Life Cycle Initiative⁽¹⁰¹⁾. That document provides a reference set of stakeholders and impact categories to consider in an S-LCA study (Table 13).

⁽⁹⁸⁾ UNEP/SETAC Life Cycle Initiative (2009), Guidelines for social life cycle assessment of products.

⁽⁹⁹⁾ Interorganizational Committee on Guidelines and Principles (ICGP) (1995), 'Guidelines and principles for social impact assessment', *Environmental Impact Assessment Review*, Vol. 15, No 1, pp. 11–43.

⁽¹⁰⁰⁾ Pelletier et al. (2018).

⁽¹⁰¹⁾ UNEP/SETAC Life Cycle Initiative (2009).

Table 13 Social LCA framework of impact subcategories and related stakeholder categories

Stakeholder categories	Subcategories
Workers	Freedom of association and collective bargaining
	Child labour
	Fair salary
	Working hours
	Forced labour
	Equal opportunities/discrimination
	Health and safety
	Social benefits/social security
Consumers	Health and safety
	Feedback mechanism
	Consumer privacy
	Transparency
	End-of-life responsibility
Local community	Access to material resources
	Access to immaterial resources
	Delocalisation and migration
	Cultural heritage
	Safe and healthy living conditions
	Respect of indigenous rights
	Community engagement
	Local employment
	Secure living conditions
Society	Public commitments to sustainability issues
	Contribution to economic development
	Prevention and mitigation of armed conflicts
	Technology development
	Corruption
Value chain actors (not including consumers)	Fair competition
	Promoting social responsibility
	Supplier relationships
	Respect of intellectual property rights

Source: UNEP/SETAC Life Cycle Initiative (2009)

4.2. Responsible sourcing initiatives focusing on cobalt

As highlighted in previous chapters, from a responsible sourcing point of view, cobalt can be considered the material presenting the highest risk among battery materials. Many reports by NGOs and international organisations have stressed the social risks linked to cobalt extraction in the DRC, for instance the Amnesty International report published in 2016⁽¹⁰²⁾ and others⁽¹⁰³⁾. Given the strategic importance of batteries for achieving the decarbonisation of the economy⁽¹⁰⁴⁾, several responsible sourcing initiatives and strategies have been announced regarding this material.

The promoters of these initiatives are companies in the cobalt value chain, industry organisations (e.g. industry associations or chambers of commerce), NGOs, private actors in the field of responsible sourcing and certification of raw materials, and also government programmes.

In this section we describe the main initiatives on responsible sourcing of cobalt, describing objectives, focus (the supply chain step that is addressed), general features and risks/issues of concern that are under scrutiny.

⁽¹⁰²⁾ Amnesty International (2016).

⁽¹⁰³⁾ E.g. SOMO (2016).

⁽¹⁰⁴⁾ See, for example, Commission communication – A clean planet for all: A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy (COM(2018) 773 final).

4.2.1. Cobalt Industry Responsible Assessment Framework

The Cobalt Industry Responsible Assessment Framework (CIRAF) is an industry scheme proposed by the Cobalt Institute, a non-profit trade association composed of cobalt producers, users, recyclers and traders. The framework, launched in January 2019, consists of a list of risk categories and risk priority areas to be assessed by companies buying or producing cobalt when performing due diligence. The CIRAF project seeks to:

1. identify material risks within the cobalt sector for CIRAF participants as well as their customers;
2. provide a good-practice-based framework that will provide guidance to CIRAF participants on how to respond to core risks and report on existing responses with the degree of flexibility appropriate to their operations;
3. ensure the framework is credible, well managed and accepted by stakeholders ⁽¹⁰⁵⁾.

CIRAF is not a certification scheme or an audit programme. CIRAF participants must identify which risk categories and risks apply to their operations based on a materiality assessment. As a baseline requirement, participants must obtain third-party assurance of their policies and due diligence management systems for human rights.

Table 14 shows the list of aspects included in CIRAF.

Table 14 Risk categories and priority areas suggested in the CIRAF framework

Risk category	Priority risk area
Environment	Air/water/soil/environmental impacts
	Biodiversity impacts
OHS	OHS and working conditions
Human rights	Conflicts and financial crime (*)
	Human rights impacts (aligned with Annex II model policy in OECD Guidance)
	Worst forms of child labour (*)
Community engagement	ASM
	Livelihoods
	Resettlement

OHS, occupational health and safety.

(*) Included in the OECD Guidance, to an extent.

4.2.2. Umicore sustainable procurement framework for Cobalt

Umicore is a global material technology and recycling group. It owns two cobalt refineries in Belgium and Finland and has one minority joint venture in China. It buys its raw refined materials (e.g. cobalt hydroxide) directly from mine sites, including from DRC mines. The group has developed its own sustainable procurement framework, which applies to all its cobalt purchases. The application of the framework aims to minimise the risk of any possible connection between the cobalt in its supply chain and human rights issues or unethical business practices.

The framework ⁽¹⁰⁶⁾ is based on the OECD Guidance and was audited by a third party. The Umicore management due diligence system includes four steps (Figure 6).

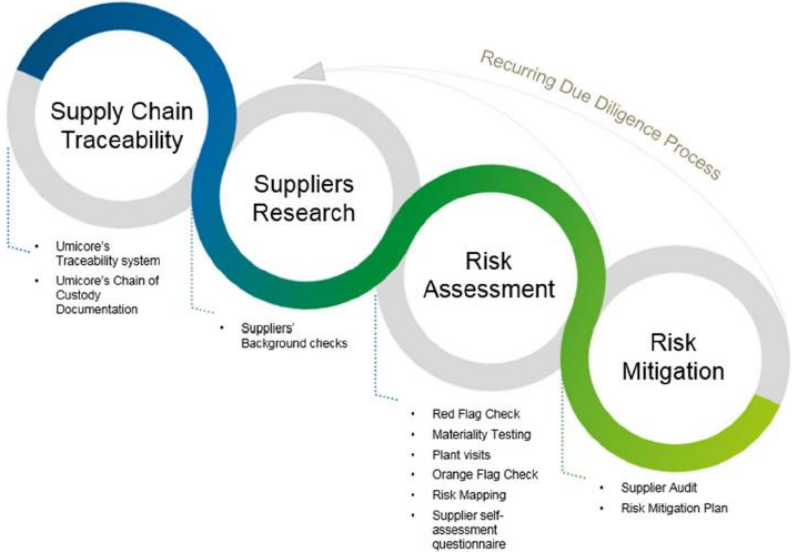
1. Supply chain traceability, whereby the company identifies and registers the origin of cobalt-containing raw materials, using logistical and commercial documentation.
2. Supplier research, including a first assessment of potential new suppliers (including collection of information on the ground, through plant visits).

⁽¹⁰⁵⁾ Cobalt Institute and CIRAF (2019).

⁽¹⁰⁶⁾ Umicore (2019).

3. Risk assessment, whereby all suppliers are evaluated for their practices (Table 15Figure 6). Unacceptable practices (e.g. torture, child labour, corruption) are categorised as red flags and lead to the elimination of that supplier. Artisanal mining and hand-picking fall under this category and are therefore excluded by the Umicore supply chain. A materiality test is then applied, meaning that suppliers contributing less than 1% of the total cobalt supply of the company are excluded from the following steps of the assessment. Mine visits are then performed, twice per year in the case of the DRC. The orange flag check includes the assessment of aspects that can be remediated by the supplier (including artisanal mining as a secondary source, which has to be remediated in a reasonable time frame, or lack of minimum required legal permits and certificates). The approval or exclusion of orange-flagged companies is decided by an approval committee. In the last phase of the risk assessment, Umicore assigns a risk level to the supplier, based on its sustainable procurement and ethical business practices. Companies with a low/medium to high risk score are further assessed through questionnaires.
4. Risk mitigation, the last phase of the process, which includes the identification of remediation actions on the identified issues.

Figure 6 Steps in the Umicore due diligence process



Source: Umicore (2019)

In line with the fourth step of the OECD Guidance, Umicore is committed to having its due diligence practices audited by independent third parties. The framework is audited by a third party and Umicore is reporting on its due diligence practices for cobalt in its annual report (e.g. 'Due diligence compliance report cobalt procurement 2019' ⁽¹⁰⁷⁾).

⁽¹⁰⁷⁾ <https://www.umicore.com/en/cases/sustainable-procurement-framework-for-cobalt/compliance-report>.

Table 15 List of criteria for the Umicore supplier assessment

Red flag criteria	Orange flag criteria
Any form of torture, cruel, inhuman or degrading treatment or punishment Any form of forced or compulsory labour Any form of child labour Any form of bribery or corruption related to cobalt operations Hand-picking and/or artisanal mining (as primary source) Supplier is not willing to accept the principles stated in the Umicore Charter or does not have similar policies in place	Hand-picking and/or artisanal mining (as secondary source) Supplier does not have the minimum required legal permits and certificates Supplier does not have procedures in place to minimise environmental impact Supplier does not have procedures in place to ensure a healthy and safe working environment

Note: Red-flagged suppliers are excluded from the supply chain; orange-flagged suppliers have some time to take corrective actions before being reassessed.

4.2.3. Responsible Cobalt Initiative of the CCCMC

The Responsible Cobalt Initiative⁽¹⁰⁸⁾ was launched in November 2016 by the CCCMC, with the support of the OECD. Many companies in the electronic industry are involved. The objectives are to:

- ‘Have downstream and upstream companies recognise and align their supply chain policies with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas and the Chinese Due Diligence Guidelines for Responsible Mineral Supply Chains in order to increase transparency in the cobalt supply chain and improve supply chain governance.
- ‘Promote cooperation with the Government of the Democratic Republic of the Congo, civil society, and affected local communities to take and/or support actions that address the risks and challenges in the cobalt supply chain.
- ‘Develop a common communication strategy to communicate progress and results effectively to impacted communities, miners, and the public; to harmonise working objectives and plans with other stakeholders.’

No more information is publicly available on this initiative.

4.2.4. Responsible Minerals Initiative cobalt due diligence standard and reporting template

The Responsible Minerals Initiative (RMI) was created in 2008 by members of the Responsible Business Alliance and the Global e-Sustainability Initiative, and has grown into one of the most utilised and respected resources for companies from a range of industries addressing responsible mineral-sourcing issues in their supply chains. The RMI offers a variety of tools and services to assist companies in creating sustainable supply chains⁽¹⁰⁹⁾.

1. The **Cobalt Reporting Template (CRT)** serves to identify choke points and collect due diligence information in the cobalt supply chain. It was formally launched in December 2018. The RMI reviewed and integrated feedback from the pilot phase into the current version of the CRT. The CRT was designed for downstream companies to gather and disclose information about their supply chains. RMI members collaboratively developed this tool to create efficiencies and simplify the supply-chain-surveying process. Downstream companies include those companies from the end user up to but not including the smelter.

⁽¹⁰⁸⁾ <http://www.respect.international/responsible-cobalt-initiative-rci/>.

⁽¹⁰⁹⁾ <http://www.responsiblemineralsinitiative.org/emerging-risks/cobalt/>.

2. The **Pilot Cobalt Refiner Due Diligence Standard** was developed in collaboration by CCCMC, the Responsible Cobalt Initiative and the RMI. The risks to be assessed under this standard are described in Table 16, and they include the CCCMC Guidance or the OECD Guidance, as well as additional risks.
3. Other tools not specific to cobalt include the Risk Readiness Assessment, a voluntary self-assessment and self-reporting tool for mineral and metal producers and processors to communicate their environmental, social and governance practices and performance.

Table 16 List of risks included in the RMI standard

CCCMC Guidance: Annex Model Supply Chain Policy	OECD Guidance, Annex II Model Policy
<p>Serious human rights abuses associated with the extraction, transport or trade of minerals:</p> <ul style="list-style-type: none"> • any forms of torture, cruel, inhuman and degrading treatment, • any forms of forced or compulsory labour, • the worst forms of child labour, • other gross human rights violations and abuses such as widespread sexual violence, • war crimes or other serious violations of international humanitarian law, crimes against humanity or genocide. <p>Direct or indirect support to non-state armed groups and public or private security forces.</p> <p>Corruption, money laundering and payments to governments.</p>	<p>Serious abuses associated with the extraction, transport or trade of minerals:</p> <ul style="list-style-type: none"> • any forms of torture, cruel, inhuman and degrading treatment, • any forms of forced or compulsory labour, • the worst forms of child labour, • other gross human rights violations and abuses such as widespread sexual violence, • war crimes or other serious violations of international humanitarian law, crimes against humanity or genocide. <p>Direct or indirect support to non-state armed groups.</p> <p>Direct or indirect support to public or private security forces.</p> <p>Bribery and fraudulent misrepresentation of the origin of minerals.</p> <p>Money laundering.</p> <p>Non-payment of taxes, fees and royalties to governments.</p>
<p>Additional risks:</p> <p>Occupational health and safety conditions that are not adequate to maintain the miners', direct employees' and indirect employees' physical and mental health.</p>	

4.2.5. Eurasian Resources Group Clean Cobalt Framework

The Eurasian Resources Group (ERG) produces cobalt in the DRC and expects to increase its cobalt production through the Metalkol roan tailings reclamation project in the Kolwezi area. This project aims to extract cobalt and copper from two tailing deposits ⁽¹¹⁰⁾.

Through the Clean Cobalt Framework the company wants to communicate its commitment to stakeholders and costumers to source responsibly produced materials. In particular, the company wants to ensure that its cobalt production is compliant with the OECD Guidance and that other important human rights and sustainability issues are managed in line with the UN Guiding Principles on Business and Human Rights.

The framework is based on the OECD Guidance and addresses other aspects:

⁽¹¹⁰⁾ ERG (2019).

child labour, with the age limit for employment set at 18,

traceability of cobalt in the stages of origination, processing and transport, through the provision of a chain of custody management system,

exclusion of ASM materials from the supply chain,

environment restoration (due to the nature of the project, which is a tailings reclamation operation),

collaboration in the promotion of sustainable community development.

4.2.6. Projects on cobalt artisanal mining

Various stakeholders have launched initiatives on responsible cobalt sourcing, which aim to improve the conditions of workers in artisanal cobalt mining sites in the DRC. To our knowledge, three initiatives are currently in place. Two of them had been running for close to 1 year at the time of this report's field data collection phase, and therefore were chosen for in-depth analysis, described in Chapter 4.1.

Table 17 summarises these initiatives and their main characteristics.

Table 17 Characteristics of initiatives on the ground

Name	Promoters and implementers	Date of launch	Characteristics
Better Mining (*)	RCS Global Group (audit and consulting group); Coopérative Minière Kupanga (Comiku); Congo Dongfang International Mining (CDM).	June 2018 (pilot phase) January 2019	Implemented in the Kasulo artisanal mining area, it is a site-monitoring solution that generates monthly incidents reports and corrective action plans for its implementer
Mutoshi Pilot Project (*)	Partnership between the Trafigura Group (a commodities trading and logistics company), Chemaf (a mining company), Comiakol (an ASM cooperative) and Pact (an international NGO)	April 2018	Implemented in the Mutoshi concession, it aims to improve safe working conditions through site monitoring and reporting information on incidents; technical knowledge of ASM and of downstream demands; community outreach; and raising hazard awareness and safety management capacity among ASM miners
Cobalt for Development	Industries (BMW Group, BASF SE, Samsung SDI and Samsung Electronics); German federal agency for cooperation and development (GIZ GmbH)	October 2019	The scope is to improve artisanal mining working conditions, as well as living conditions for surrounding communities

(*) These initiatives are described in detail in Chapter 5.

4.3. Main findings of the chapter

Several responsible sourcing initiatives exist for cobalt, the material presenting the highest risk among the battery materials (see Chapter 2). These initiatives are promoted by various stakeholders (industry, international organisations) and most of them refer to the OECD Guidance, even though none of them have undergone a formal OECD Alignment Assessment ⁽¹¹⁾. The OECD standard focuses on specific issues for the mineral supply chains extracted in CAHRAs (indeed, the guidance underpins the EU Conflict Minerals Regulation), for instance the misrepresentation of the origin of minerals and the use of security forces on mining sites. The IFC PS and the S-LCA framework have a more general scope, as they include aspects

⁽¹¹⁾ OECD (2018).

typically addressed in sustainability assessment ⁽¹¹²⁾ and can be applied to any economic activity. The CCCMC standard, while being specific to mineral supply chains, encompasses the OECD risk areas and some of the IFC sustainability criteria, such as indigenous peoples' and local communities' rights, as well as environmental management and biodiversity. The Umicore and Metalkol frameworks focus on specific risks included in the OECD Guidance and also consider the supply from artisanal mining a source of risk. The RMI standard reflects the OECD list of risks, and adds the working conditions. Four initiatives are implemented in the upstream phase and three of them (Better Mining, Mutoshi and Cobalt for Development) engage with the artisanal mining sector and work on the ground in order to improve working conditions in the DRC. The impacts of two of them (those implemented for at least 1 year) are discussed in the following chapter. Figure 7 shows the positioning of the initiatives discussed above within the value chain.

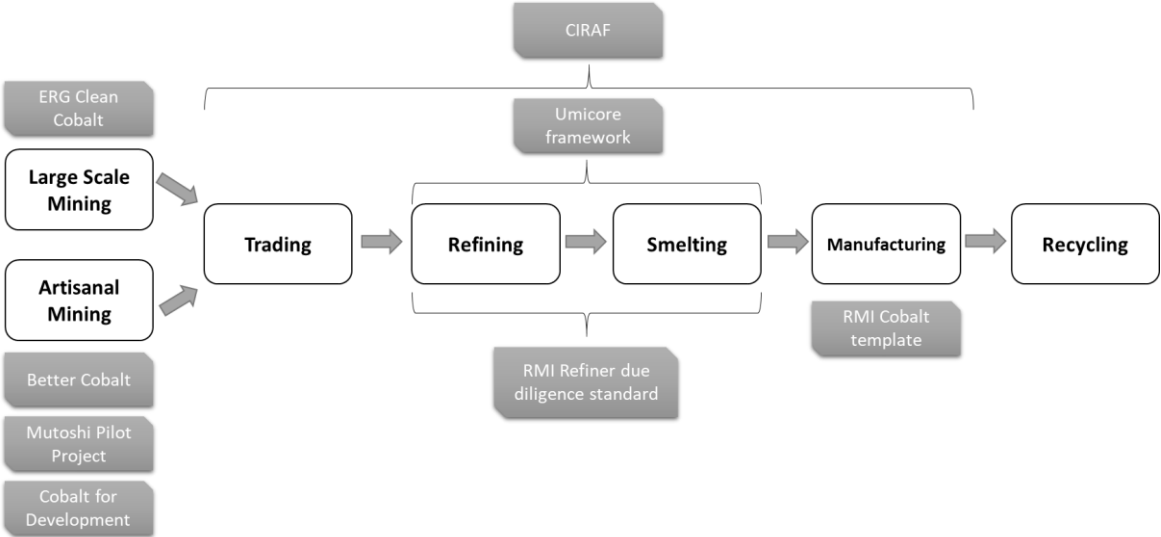


Figure 7 Positions of the actors implementing responsible sourcing initiatives in the material value chain

⁽¹¹²⁾ The IFC PS include both social and environmental aspects, whereas S-LCA is a separate methodology and environmental aspects are mainly captured by the life-cycle assessment.

5. Field investigation on two responsible sourcing initiatives operating in artisanal mining of cobalt in the Democratic Republic of the Congo

5.1. The Congolese 2C ASM sector

Understanding the impact of responsible cobalt from the DRC ASM sector cannot be done without understanding the relevant characteristics of the sector. To do so, this section briefly outlines its defining relevant characteristics; for further details and nuance, the reader is directed to the recent studies made by the BGR⁽¹¹³⁾ and the OECD⁽¹¹⁴⁾.

Estimates and findings presented in published reports are by nature conservative, as publicly available reports only present findings that can be backed by indisputable evidence. In the field, reality is often richer and more nuanced. For example, the presence of politically exposed persons (PEPs) in organisations is seldom demonstrable and thus not reported, but in the field ‘everyone knows’ and, importantly, all actors behave accordingly, making these unprovable facts a hard reality. Furthermore, difficulties in accessing sites, not least due to the presence of uncooperative armed forces or companies⁽¹¹⁵⁾, are likely to produce a bias towards better managed, and thus more accessible, sites in data collection exercises.

Thanks to the geological make-up of the region, both cobalt and copper (2C) can be extracted not only from the same deposits but often also from the same ores. Their supply chains can also overlap for most of their journey and therefore the 2C sector is often considered as a whole during the analysis of one of its components. Thus, while this analysis looks specifically at the cobalt ASM sector, information on cobalt LSM as well as on copper ASM and LSM will be provided when relevant to the understanding of the sector.

The DRC has become a focal point of discussions on the sustainability and impact of batteries, because of both its pre-eminence in the global supply of cobalt and its governance conditions. The country’s provinces of Haut-Katanga and Lualaba currently account for 57 % of the global cobalt mine production⁽¹¹⁶⁾ and hold just under half of the world’s known reserves⁽¹¹⁷⁾; the country’s cobalt ASM sector accounts for 15–40 %⁽¹¹⁸⁾ of this production according to various estimates, with most hovering around the 20–25 % mark. This makes the DRC cobalt ASM sector the second world producer, equalling or surpassing the combined production of Russia and Australia (the world’s second and third largest cobalt-producing countries)⁽¹¹⁹⁾.

Specific terminology

Within this chapter, the following distinctions are made:

Creuseurs refers to ASM diggers. **ASM miners** refers to all categories of workers directly involved in mineral production on an ASM site (*creuseurs*, washers, transporters).

System refers to the purpose-designed management and/or technological tools that aim to support the responsible sourcing of cobalt. **Initiative** refers to concrete responsible cobalt-sourcing programmes currently deployed on the ground, which include a system as a component.

Site refers to the dedicated ASM area (including the extraction, washing and temporary storage subareas). **Title** refers to the entirety of the mining title, of which the site might only be a part.

Pilot refers to the implementation of an initiative on a site. If the initiative has been tailored to the specifics of a site, then the term encapsulates those changes.

Informal refers to all ASM activities taking place either outside an established ASM mining zone (*zone d’exploitation artisanale*, ZEA) or outside the framework provided by agreements between ASM miners and the title holder. While technically such mines are illegal under Congolese law, characterising them strictly as such has proven to be highly counterproductive from a research and policy perspective.

⁽¹¹³⁾ BGR (2019)

⁽¹¹⁴⁾ OECD (2019).

⁽¹¹⁵⁾ For example, BGR (2019) reports not having been able to access 13 of the 79 ASM sites it had located. In 5 cases this access to the sites was refused by Congolese armed forces, while in 8 cases access was denied by companies or cooperatives.

⁽¹¹⁶⁾ Based on U.S. Geological Survey (2018).

⁽¹¹⁷⁾ Based on U.S. Geological Survey (2019).

⁽¹¹⁸⁾ Sources: OECD (2019), BGR (2019), CSO representatives consulted; some of these sources are based on non-public Ministry of Mines estimates. Estimates congruent with the consultant’s own estimates.

⁽¹¹⁹⁾ Based on U.S. Geological Survey (2018),.

DRC cobalt ASM is thus globally significant not only in size but also in impact. During recent years ASM has been an incredibly dynamic supplier, able to ramp up production in a heartbeat compared with the LSM sector and its longer-term planning and heavier investment requirements ⁽¹²⁰⁾. Effectively, DRC ASM cobalt miners have become the swing producers of global cobalt supply chains, smoothing the global supply of the metal ⁽¹²¹⁾. This same dynamism has recently led a number of ASM cobalt miners to shift their focus towards copper in the face of lower cobalt prices, lowering the expected ASM production of cobalt in 2019.

Despite being of ASM origin, this material exits the country through raw refiners and exporters that mix a variety of feeds into their raw refining process prior to export (see Section 5.2.4 for further details). Moreover, the inherent dynamism of the 2C ASM sector complicates any attempts to quantify precisely the contribution of the DRC ASM sector to global cobalt supply chains.

When it comes to requirements for the responsible sourcing of minerals, the DRC has non-negligible experience with the issue of conflict minerals and their association with the ongoing conflict and violence outbreaks in the country's eastern provinces. While this issue centred on 3TG and on the conflict in the east of the country, the underlying issues of limited state capacity, high levels of corruption, grinding poverty and absence of alternative livelihoods also characterise the provinces where 2C extraction takes place. Human rights abuses linked to the exploitation of cobalt have risen to public attention in 2016 following a report by Amnesty International ⁽¹²²⁾, but have been reported on since 2011 ⁽¹²³⁾ or even 2007 ⁽¹²⁴⁾, at a time when the sector employed significantly fewer ASM miners.

5.1.1. Governance of the artisanal and small-scale cobalt- and copper-mining sector

Mining, and more specifically cobalt and copper extraction and processing, dominate the Haut-Katanga and Lualaba economies and are paramount to the lives of these provinces. Without the incomes generated from mining, these regions' inhabitants could not import the foodstuffs they require from neighbouring Zambia, as the region is not self-sufficient. While the majority of the sector's production and royalties come from LSM, ASM employs the bulk of the sector's miners, an estimated 150 000–200 000 ⁽¹²⁵⁾. Individual ASM sites sometimes employ upwards of 10 000 *creuseurs* (artisanal miners). The low-entry-barrier livelihood opportunities offered by the 2C ASM sector have recently become all the more vital in the region, as they help to absorb a substantial part of the internally displaced persons generated by the humanitarian crises taking place in the neighbouring Kasai province since 2016 ⁽¹²⁶⁾.

Despite this vital role, the sector suffers from a number of challenges that either blunt its role as an engine for local development or have negatively affected the human rights of local communities. Saemape (*Service d'Appui à l'Exploitation Minière Artisanale et à Petite Échelle*) is an agency that was created to remediate the shortcomings of the ASM sector and support its development. As the authority competent to oversee the 2C ASM sector, it is present throughout the provinces, and nationally in the DRC.

5.1.2. Location of ASM activities

According to Congolese regulations all ASM mining should take place in dedicated mining titles known as ZEAs. Yet only 4 % of ASM sites are on ZEAs, according to the BGR ⁽¹²⁷⁾. The rest are located on LSM titles, in particular on titles belonging to Générale des Carrières et des Mines (Gécamines), the dominant state-owned enterprise (SOE) of the DRC's Katangese copper belt (which amount to a little more than half of the total working ASM sites). Under Congolese law, these sites are informal if not illegal, unless there are specific arrangements in place with the title holders. Their sheer number makes them not only the most common form of ASM in the provinces but also a legitimate social phenomenon for most of the region's population. As a result, Saemape agents are regularly present on more than half of these sites, suggesting that the existence of such sites is so widespread that, for local regulatory purposes, they are the *de facto* norm ⁽¹²⁸⁾.

According to representatives of civil society organisations (CSOs), miners and state agencies consulted, the limited appetite of ASM miners for ZEAs can be attributed to a few underlying causes.

⁽¹²⁰⁾ BGR (2019).

⁽¹²¹⁾ Reuters (2019).

⁽¹²²⁾ Amnesty International (2016).

⁽¹²³⁾ Öko-Institut (2011).

⁽¹²⁴⁾ Swedwatch (2007).

⁽¹²⁵⁾ BGR (2019).

⁽¹²⁶⁾ BGR (2019).

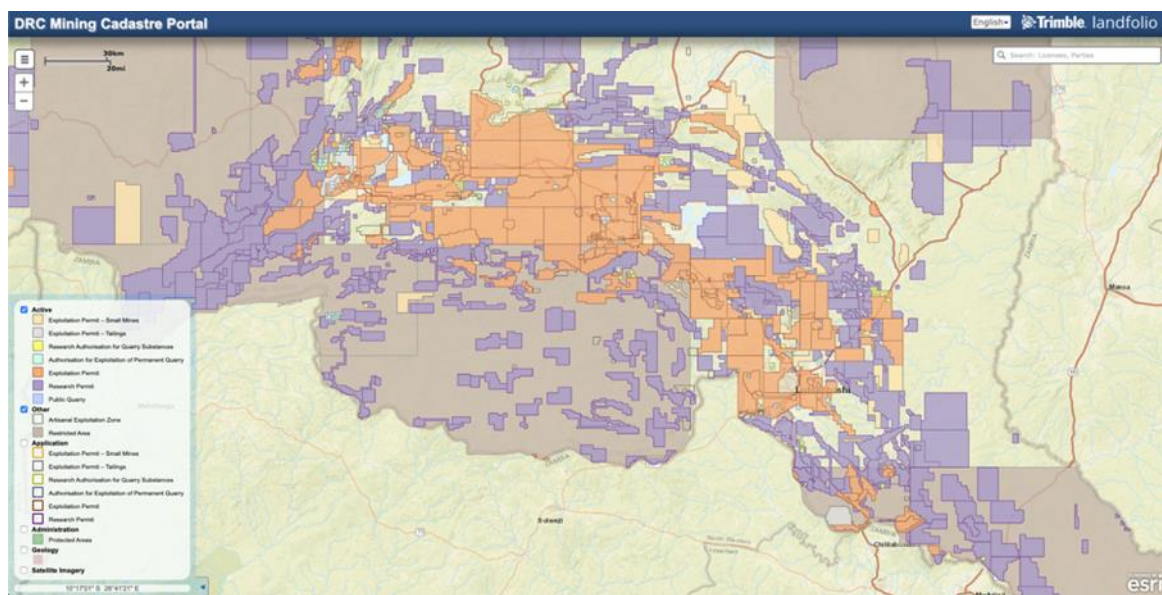
⁽¹²⁷⁾ BGR (2019).

⁽¹²⁸⁾ OECD (2019).

First, as can be seen in Figure 8, the majority of the land under and around the major cities of Lualaba and Haut-Katanga as well as around the regions' main communication axes is already titled to LSM operators, predominantly Gécamines. As can also be seen in the figure, some of these titles are well into the hundreds of square kilometres, and include villages, fields and major roads, making the monitoring of informal activities on site effectively impossible. Given this, and in the absence of marked interest from LSM operators in relinquishing part of their titles, there is virtually no space to create ZEAs that are (i) located on known deposits that are economically viable for ASM miners and their modes of extraction and (ii) close enough to a city and its amenities to be considered suitable for ASM miners, and with sufficiently developed infrastructure.

The current configuration is also exacerbated by poor enforcement of the Mining code, which requires applicants of exploration and exploitation licence to demonstrate commencement of work in order to renew their permits, and the limit of 50 for the number of permits held.

Figure 8 Extract from DRC cadastre focusing on Haut-Katanga and Lualaba



Note: Orange, exploitation permits; purple, exploration permits; brown, restricted areas.

Second, there is no investment in ZEAs and these are little more than plots of land when given to ASM miners. Making these ZEAs viable for ASM miners would require substantial investment in order to establish whether or not a mineral deposit commercially viable for ASM is present, remove the overburden to safely access the deposit, and connect the site to the road, electricity network and/or water sources.

As a result more than 90 % of 2C ASM activities take place either on LSM titles or in urban areas sitting atop economically viable deposits⁽¹²⁹⁾. Both situations create a host of problems.

Not only do urban ASM sites facilitate the occurrence of child labour, owing to the lack of adequate separation between living space and mining area, but the same lack of separation greatly contributes to poor public health and creates numerous accident risks for local communities (falls into pits, localised geological instability resulting in building collapses, etc.).

While multiple ASM/LSM configurations can, and do, exist (as detailed by the OECD⁽¹³⁰⁾), in a number of cases ASM miners have been or are still considered to be stealing the minerals from the concession and/or to be detrimental to the operational integrity and security of the title. In those cases, LSM operators rely on security services to stop the incursions, and ASM miners can on occasions react violently to efforts to evict them from their pits⁽¹³¹⁾. Only a single armed force in the DRC is authorised to be stationed on mining sites, the Mining Police (*Police des Mines et Hydrocarbures*, PMH). Despite its name, the PMH does not receive any specific training on mining-site security or ASM community management. On various recent occasions, the PMH has been singled out as having committed repeated human rights violations while undertaking its duties. This

⁽¹²⁹⁾ BGR (2019).

⁽¹³⁰⁾ OECD (2019).

⁽¹³¹⁾ OECD (2019).

force is also noted as being corruptible, especially on sites with intense activity, where a day of bribes can net an agent USD 250, compared with the monthly salary of USD 300 to USD 500 ⁽¹³²⁾.

5.1.3. Monitoring and oversight

Lack of oversight and monitoring of ASM operations located outside ZEAs is a result not only of the lack of state agents but also of limited skills and/or interest among posted agents. While Saemape agents are present on 53 % of mines, occupational health and safety (OHS) sensitisation and monitoring occur in only 28 % of sites ⁽¹³³⁾. This echoes claims from numerous *creuseurs* ⁽¹³⁴⁾ that Saemape agents on certain sites do little in regard to accident prevention and OHS monitoring and instead focus on adjudicating disputes between ASM miners and extracting payment for their presence, services and/or non-intervention. According to Enough, Saemape staff received a monthly salary of approximately USD 55 in early 2018; however, the report notes, 'it's dazzling that they own USA-made jeeps and luxurious villas in town. All that is done at the miners' expense.' ⁽¹³⁵⁾ Failure to comply with the payment demands of Saemape agents can lead to intervention by armed forces ⁽¹³⁶⁾.

5.1.4. Participation of politically exposed persons

Adding complexity to the governance of the sector is its connection to political elites. While it is likely that the true extent of the phenomenon will remain unknown, it is no secret that former President Kabila's family had, and according to numerous stakeholders on the ground still has, substantial interests in the 2C ASM sector, which include the direct control of a number of ASM sites ⁽¹³⁷⁾. Similarly, other established political figures continue to benefit from the sector and its lack of transparency, either through ownership of companies providing services to LSM companies ⁽¹³⁸⁾ or through involvement in ASM cooperatives ⁽¹³⁹⁾. These players have no interest in facilitating the underlying objectives of the international demand for responsible and transparent cobalt supply. They have instead begun to integrate themselves into the responsible cobalt narrative to their advantage, while replicating the process that has led to the concentration of the tin, tantalum and tungsten sector into the hands of a handful of actors after the emergence of extra-territorial demands for conflict-free minerals triggered by US Conflict Minerals legislation ⁽¹⁴⁰⁾. The emergence of the Touche Pas à Mon Cobalt (Don't Touch My Cobalt) campaign can be seen through this prism, although the slogan has now been adopted by those demanding better conditions for workers in the sector ⁽¹⁴¹⁾.

5.1.5. Role and influence of cooperatives

Against this backdrop, the new Congolese Mining Code of 2018 ⁽¹⁴²⁾ now requires all ASM miners to be affiliated to a cooperative, a demand consistent with the fact that ZEAs are assigned only to cooperatives. In practice, this has exacerbated some of the sector's issues.

While called cooperatives, these organisations apply few of the principles that define cooperatives ⁽¹⁴³⁾. This is particularly notable when it comes to the democratic control of cooperatives by their members, which is completely absent in our experience ⁽¹⁴⁴⁾, with only very few members allowed to vote and/or participate in decision-making. Often PEPs are representatives of cooperatives; 'C'est la coopérative de [PEP]' (it's [PEP]'s cooperative) is a common answer when broaching the subject with either miners or CSOs. Furthermore, as cooperatives are assigned to ZEAs through ministerial decrees, there is a risk that political factors and personal favours weigh heavily in that process, especially as companies that are willing to engage with ASM

⁽¹³²⁾ OECD (2019).

⁽¹³³⁾ BGR (2019).

⁽¹³⁴⁾ Comments received by the consultant during prior field visits to 2C sites in Haut-Katanga and Lualaba in 2016 and 2017.

⁽¹³⁵⁾ Enough (2018), p. 19.

⁽¹³⁶⁾ Enough (2018).

⁽¹³⁷⁾ Congo Research Group (2017); Enough (2018).

⁽¹³⁸⁾ Enough (2018).

⁽¹³⁹⁾ OECD (2019).

⁽¹⁴⁰⁾ For further details on this process see Diemel (2018)

⁽¹⁴¹⁾ Enough (2018).

⁽¹⁴²⁾ *Loi no 18/001 du 09 mars 2018 modifiant et complétant la Loi no 007/2002 du 11 juillet 2002 portant Code minier.*

⁽¹⁴³⁾ See International Co-operative Alliance (n.d.) for a summary list of these principles.

⁽¹⁴⁴⁾ Based on a review of about 15 mining cooperatives' status in the DRC in the provinces of Haut-Katanga, Lualaba, Haut-Lomami, Maniema and South Kivu, as well as interviews with miners in Haut-Katanga, Lualaba and Maniema.

miners are required to do so through a cooperative, and are usually required to pay a fee to the cooperative representative for 'cooperative management activities' ⁽¹⁴⁵⁾.

Second, according to BGR (2019), on two thirds of the sites where cooperatives are present, payment of fees or levies to the cooperatives is mandatory. This can range from a flat monetary fee for each bag of material to about 50 % of the production in the most extreme cases. Payment of the fees and 'membership' in the cooperative typically do not grant rights or benefits to the miners. Even their right to representation through the cooperative is generally trumped in favour of the representation of the interests of the voting members of the cooperative. To paraphrase a cooperative representative during a site visit, miners elect (through an unidentified mechanism) a representative who can put forward their grievances and demands during consultations with the cooperative's management, although the management has no obligation to answer these demands. Thus, cooperatives, instead of representing the interest of ASM operators, are often structures extracting payments from miners while providing them with scant or no benefits ⁽¹⁴⁶⁾.

While it is possible in theory for ASM miners to organise themselves, form a cooperative and be assigned to a ZEA, in practice this is not plausible. To do so would not only require that they possess the required legal knowledge and organisational skills to do so, but would also require a representative to travel and stay in Kinshasa to register the cooperative. Typically, ASM miners do not have access to these types of resources. Further work would also be required for the cooperative to be assigned to the desired ZEA, in competition with politically connected cooperatives. Despite these hurdles, the security of these decrees is paramount, as without them cooperatives or *creuseur* committees can be displaced from the area in which they work.

5.1.6. Human rights risks in the artisanal and small-scale cobalt- and copper-mining sector

Unlike the eastern DRC and despite some activity from a few **armed groups** ⁽¹⁴⁷⁾, there is no evidence that any armed group is taking part in the illegal taxation or control of 2C mining and trade ⁽¹⁴⁸⁾.

On the other hand, the **illegal presence of Congolese armed forces on artisanal sites** is an ongoing concern. Under Congolese law it is illegal for any armed force that is not the PMH to be found on a mine site. This includes the Congolese Army (*Forces Armées de la RDC*, FARDC), the Republican Guard (*Garde Républicaine*, GR) ⁽¹⁴⁹⁾, other branches of the police or any other armed forces. It should be noted that both the FARDC and the GR have repeatedly been flagged as institutions committing significant human rights abuses in their operations.

Whether intelligence services such as the ANR (*Agence Nationale de Renseignement*), FARDC's Demiap (*Détection Militaire des Activités Anti-Patrie*), or the police's Bureau 2 have a place on mine sites is somewhat less clear cut. The ANR even has a limited role in the issuance of some paperwork on sites ⁽¹⁵⁰⁾.

As noted by BGR, access to sites is sometimes denied by armed forces, in particular the GR or the National Police, and in the experience of the consultant the ANR ⁽¹⁵¹⁾. Despite these access difficulties, the outlook produced by BGR is telling: a little fewer than half of the sites (41 % of sites) exhibit the presence of members of the armed forces that are barred from mining sites, while the presence of intelligence agencies is even more common (47 % of sites), and given the nature of these services this statistic is likely to be a low estimate. Similarly, research by the University of California at Berkeley's Center for Effective Global Action found out that the PMH was only present in half of the sites assessed, while other services of the National Police were present in 30 % of sites ⁽¹⁵²⁾.

In addition to members of the armed forces, private security providers can also be found on certain LSM sites. Uptake of best practices in the provision of security by either armed forces or private security, such as the

⁽¹⁴⁵⁾ OECD (2019).

⁽¹⁴⁶⁾ See for example the case of *Exploitants Miniers Artisanaux du Katanga en Coopérative*, which has been mentioned by Global Witness (2006), CASM (2007), World Bank (2008), Pact (2010) and Amnesty International (2014) as behaving in a predatory fashion towards its members.

⁽¹⁴⁷⁾ Including Mai-Mai groups (Bakata Katanga and Apa na Pale) as well as several Twa and Luba armed groups engaged in communal violence.

⁽¹⁴⁸⁾ OECD (2019).

⁽¹⁴⁹⁾ The GR, an elite security force controlled by the Presidency 'and not integrated into the national army [,] "is better trained, equipped, and paid than the FARDC, and its control runs outside the army chain and command." It is also seen as more loyal to the government than the army is, thereby serving as buffer against coups or professionally minded officers withdrawing support from the regime' (Enough, 2018, page 17).

⁽¹⁵⁰⁾ Specifically, the loading and unloading report (OECD, 2019).

⁽¹⁵¹⁾ BGR (2019).

⁽¹⁵²⁾ Center for Effective Global Action (2017).

Voluntary Principles on Security and Human Rights (VPs) or the International Code of Conduct for Security Providers (ICoC), is limited to the providers working with a few of the largest LSM operators. This is also true of the PMH, whose members receive no mining- or ASM-specific training or training on the VPs and are typically simply relocated from standard police units ⁽¹⁵³⁾.

A number of **serious human right violations** are linked to the presence of these different forces. As Enough (2018) ⁽¹⁵⁴⁾ submits, 'there are also indications Republican Guard forces are violently or otherwise forcefully repressing disputes at mine sites' ⁽¹⁵⁵⁾. The recent posting on Twitter by an opposition politician of a video showcasing the whipping of a presumed *creuseur* in the locality of Kambove ⁽¹⁵⁶⁾ seems to further corroborate these claims. According to Amnesty International (2016), children have also reported being beaten by security guards when trespassing on sites.

The recent presence of the FARDC, deployed to control an ASM invasion on LSM mining titles in mid-2019 ⁽¹⁵⁷⁾, has also led to severe human rights abuses, including the death of *creuseurs* or local community members according to local CSOs ⁽¹⁵⁸⁾ and reports from media sources ⁽¹⁵⁹⁾. Historically the interventions of Congolese Armed Forces have often been problematic ⁽¹⁶⁰⁾. It should also be noted that General John Numbi, the inspector-general of the Congolese armed forces and in charge of the 2019 operation, has previously been targeted by US sanctions in relation to the political violence that accompanied the last presidential election cycle ⁽¹⁶¹⁾.

High levels of poverty and lack of other livelihood options mean that migrant workers with few options provide an ample and steady supply of labourers to the 2C ASM sector and cases of **forced labour** do not seem to take place in the sector. Nevertheless, the extremely unequal relationships between miners on the one hand and buyers and financiers on the other, while not constituting forced labour, are far from desirable. Similarly, *creuseurs* regularly complain about the (mis)calculation of mineral content in the ore they sell. In itself, it does not qualify as an indication of forced labour through withheld wages and/or unclear/unjustified deductions, despite being a key concern more generally.

The **worst forms of child labour** are a feature of the 2C ASM sector. BGR (2019) estimates that children (understood as individuals under 18 years old) are present on 29% of sites and as a whole the 2C sector probably employs a little fewer than 5 000 children ⁽¹⁶²⁾. While a few children go into the pits, the vast majority of them work on surface activities, such as hand-picking, washing, sorting and transporting, in particular when younger than 15 years old ⁽¹⁶³⁾.

Children who are not involved with mining work can be found on mining sites either selling food and drinks or because their mothers bring them on site in order to supervise them in the absence of school or daycare options or because the site is located in an urban setting ⁽¹⁶⁴⁾.

Mining activities and their potential impacts on children and young teenagers are problematic without a doubt. At the same time, it should be understood that most of the children who turn to this activity do so for lack of other opportunities, especially as the tasks they engage in typically receive less compensation than those of adults. Some of these children also head their own families, as a result of either teenage pregnancies or the need to take care of their siblings. These are already among the most vulnerable children in the DRC and can be negatively affected by bans on child labour that do not offer livelihood alternatives. Lack of free education

⁽¹⁵³⁾ OECD (2019).

⁽¹⁵⁴⁾ Enough (2018), p. 18.

⁽¹⁵⁵⁾ During 2C ASM site visits in 2016, ASM miners in both an ASM site in Kolwezi and an ASM site in Kambove mentioned to the consultant the use of beatings, whippings, temporary incarceration and theft of production by either the GR or the FARDC units found at the mine sites at the time, comments backed up by local CSOs. The consultant could not further document these allegations.

⁽¹⁵⁶⁾ The video, which shows the beating/whipping and public humiliation of a bare-chested individual in front of mining trucks by a non-uniformed armed man, was still available online via the politician's account on 14 October 2019 (<https://twitter.com/MuyamboKyassa/status/1134090088282021890>). A copy of the video has been kept on file in case of online deletion.

⁽¹⁵⁷⁾ Bloomberg (2019).

⁽¹⁵⁸⁾ ONG Espoir (2019a,b).

⁽¹⁵⁹⁾ RFI (2019).

⁽¹⁶⁰⁾ Bread for All et al. (2014).

⁽¹⁶¹⁾ *Guardian* (2016).

⁽¹⁶²⁾ BGR (2019); Center for Effective Global Action (2017).

⁽¹⁶³⁾ Center for Effective Global Action (2017).

⁽¹⁶⁴⁾ Center for Effective Global Action (2017).

(¹⁶⁵) is the other push factor behind child labour in the 2C sector and, while the Congolese Constitution grants free schooling to all Congolese children, education still often comes at an unaffordable cost for parents, as they must purchase school supplies and sometimes pay a fee to teachers.

The 2C ASM sector could not exist in its current form without substantial levels of **corruption**, as the overwhelming majority of the sector's production comes from outside ZEAs and is thus by definition informal if not illegal. Virtually all the material travelling to ASM trading hubs, such as the Musompo market, and sold there comes from sources that are not legal, as at the time of the field visit only two ZEAs were in production (¹⁶⁶). BGR further reports that barriers are found at the entrance to ASM sites or on their access routes in 38 % of sites, in which case it is necessary for the transporter to pay a levy to the state agent present. As a rule, these payments do not generate any form of receipt and are not enshrined by law. Accordingly, corruption takes place not only during the extraction of material but also during transport and trading.

A number of documents are issued by Congolese authorities with the objective of establishing a certain level of traceability. However, as the vast majority of ASM operators work on LSM sites, it can be necessary for them to obtain a document specifying the origin of the minerals as being from a ZEA (¹⁶⁷). In this case, it will be necessary to offer a payment to the actors issuing the documentation. This leads to the **misdeclaration of origin of minerals**. Yet, often, the origin of minerals is not a concern of the buyers or of the other stakeholders present along the supply chain, who simply do not ask about the origin of the minerals or are content with receiving the vaguest of answers. The origin of minerals becomes an issue when traceability is requested because of external demands, such as midstream or downstream requirements.

As ASM miners operate mostly informally, the **payment of taxes** to authorities from ASM operators is very limited. According to BGR (2019), 60 % of sites pay no taxes, whether legal or extra-legal. At the level of 2C traders, a number of schemes take advantage of equipment shortcomings (absence of weighbridges or mineral-testing capacity) that affect the capacity of government agencies to illegally minimise their tax exposure (¹⁶⁸).

According to the Extractive Industry Transparency Initiative's (EITI's) draft 2017 scoping report, neither Haut-Katanga nor Lualaba reported any payment of ASM-specific taxes. This includes payments related to the issuance of the *carte de creuseur* (digger's card), arguably the easiest form of ASM taxation to implement. Most other provinces, including those where ASM plays a much smaller role, declare the payment of ASM-specific taxes (¹⁶⁹).

Cartes de creuseur

Creuseurs are mandated by the DRC mining code to obtain this individual identification. At the time of the field visit these cards had not been issued in either Haut-Katanga or Lualaba. According to an interviewed Saemape official, this is mostly because of pragmatic considerations: if diggers paid to receive these cards, they would then request access to viable ZEAs, which the officials cannot grant, and the likely result would be disturbances to the current social peace.

As ASM activity is generated by community members, the 2C ASM sector does not generate substantial levels of displacement and resettlement. The notable exception is the Kasulo site, although the cause of the displacement and resettlement was not the ASM activity itself but rather the provincial government's formalisation efforts (see Section 5.5.9).

OHS is abysmal on ASM sites. To access the mineral veins, *creuseurs* dig underground tunnels that sometimes stretch



Picture 1 Dangerous pits with 25-m-deep galleries on loose tailings

(¹⁶⁵) The Congolese constitution (art 43) states that primary education is free and mandatory. However, parents are often not able to afford the costs (e.g. uniforms, school consumables, sometimes fees to the teachers) and opportunity cost of school.

(¹⁶⁶) BGR (2019).

(¹⁶⁷) OECD (2019).

(¹⁶⁸) OECD (2019).

(¹⁶⁹) EITI (2019).

deeper than 50 m. Owing to the haphazard reinforcement of galleries and lack of coordination between neighbouring pits, gallery collapses are far from being unheard of. Over the 6-month period preceding fieldwork a number of accidents happened in and around Kolwezi, probably claiming the lives of around 100 *creuseurs* ⁽¹⁷⁰⁾; in 2018 ‘a total of 63 fatal accidents and 101 accidents resulting in injuries were reported’ ⁽¹⁷¹⁾.

In addition to these immediate risks, ASM miners are also exposed to potentially lethal long-term impacts, mostly in the form of pneumoconiosis caused by dust inhalation ⁽¹⁷²⁾ and also potentially due to the exposure to the radioactive elements that can be found in cobalt ore ⁽¹⁷³⁾. ASM miners are also exposed to the long-term detrimental health effects of heavy manual labour, such as (incapacitating) back pain, a problematic old age prospect considering the lack of social safety net or pensions.

Personal protective equipment (PPE) is also exceedingly rare on sites. Most miners work with a simple shirt on their back and are often barefoot, which they say gives them better purchase when climbing down into the pits.

ASM miners should receive training and support from both Saemape and cooperatives in order to work more safely and follow the established practices. In practice, according to observations and BGR (2019, p. 20), ‘workers are neither sensitised to occupational health and safety and hygiene to a sufficiently consistent degree, nor is appropriate protective equipment provided [and therefore] risks are apparent in poor mine



Picture 2 Creuseur without PPE

design, lack of personal protective equipment, lack of training and accident records [...]. The high number of accidents (occupational health and safety) reflects not only this shortcoming, but also the generally inadequate supervision and safety-related monitoring of mines.’

It is indubitable that the 2C ASM sector generates its share of **environmental and public health impacts** in the region. However, it is not possible to conclusively attribute the diffuse sources of pollution (such as airborne dust, nitrogen oxide or greenhouse gas emissions caused by additional traffic) and their impacts on public health to a single site. Pinpointing the origin of the pollution of rivers and streams is somewhat more feasible.



Picture 3 Cobalt ore washing

The horizontal and dynamic nature of ASM sites, along with the lack of training and support from both Saemape and cooperatives mentioned in previous sections, has resulted in the total absence of any form of environmental management plan or measures on most ASM sites. Rivers are particularly affected, as they are used to wash minerals. The process, in addition to the increased siltation, contaminates these rivers not only with copper and cobalt elements but also with the heavy metals and/or radioactive elements, such as uranium, associated with certain 2C mineralisations. The public health impact of radioactive elements emitted from the mining and beneficiation processes in particular is worrying and barely understood ⁽¹⁷⁴⁾.

⁽¹⁷⁰⁾ More specifically, 13 people died at KOV, a site on Kamoto Copper Company’s title in March (Radio Okapi, 2019a), and again in June 50 to 70 *creuseurs* died at that site (*La Libre*, 2019a,b). Four *creuseurs*, including three underage miners, died in a cave-in in the Biwaia site in September 2019 (Radio Okapi, 2019b). Just a week before the start of this project’s fieldwork, in October 2019, seven *creuseurs* died on the Kamilombe site and four were still missing according to Saemape sources consulted.

⁽¹⁷¹⁾ BGR (2019), p. 40.

⁽¹⁷²⁾ Kabamba et al. (2016).

⁽¹⁷³⁾ Nkulu et al. (2009).

⁽¹⁷⁴⁾ Nkulu et al. (2009).

Despite tribal affiliations playing a central role in Katangese politics, only the Twa (one of the ethnicities composing the African Pygmies) could be understood as an **indigenous people** in line with IFC performance standard No 7 ⁽¹⁷⁵⁾. The Twa are notably absent from the Katangese copper belt.

Despite the recent massive internal migratory influx from the Kasai, stakeholders consulted have not mentioned significant or even visible **discrimination** issues. The DRC's President's familial links to Kasai seem to have somewhat helped the social standing of these internally displaced persons, according to comments from miners.

Roles in the ASM sector follow strict **gender** lines and very few women take mining activities that are not related to the less strenuous activities of washing and sorting ⁽¹⁷⁶⁾. These activities are typically paid less than the extraction of minerals, as they are not only less strenuous and risky but also subcontracted by the *creuseurs*. This is in part because of customary beliefs, according to which the presence of a woman in a pit will sterilise the pit. That belief also penalises women traders, as they are not able to physically check that they receive the entirety of the production of the pits they finance ⁽¹⁷⁷⁾.

A small number of women can also work as merchants in the mining sites, which is a more remunerative activity compared to minerals washing, handpicking, and the sale of foodstuffs and sundries on site.

According to CSO staff consulted, Katangese society is overall more gender conservative and rigid than the country's eastern provinces, further stratifying the existing gender dynamics and keeping women in the back seat (especially as gender perceptions are so strongly entrenched in the 2C ASM sector). This is visible in the coupling of the issues of the worst forms of child labour and the presence of pregnant women on mining sites.

The role of women in artisanal mining has raised a growing scholarly interest, and many studies on this topic explore gender aspects in relation to, e.g. migration flows ⁽¹⁷⁸⁾, conflicts ⁽¹⁷⁹⁾ power relations ⁽¹⁸⁰⁾, etc. Some studies describe risks of abuses for women in the artisanal mining sites, such as sexual and gender based violence ⁽¹⁸¹⁾. Others argue that the ASM sector offers important livelihood opportunities for women, and that the women's role in the sector should be strengthened ⁽¹⁸²⁾.

5.2. Artisanal and small-scale cobalt- and copper-mining value chains

To contextualise the sector further and better understand the potential impacts of responsible sourcing initiatives, it is necessary to understand how the 2C ASM sector supply chain works (see Figure 11 for a visual summary).

⁽¹⁷⁵⁾ Widely considered the reference laying down the defining characteristics of an indigenous group by most major stakeholders in the extractive sector.

⁽¹⁷⁶⁾ BGR (2019).

⁽¹⁷⁷⁾ OECD (2019).

⁽¹⁷⁸⁾ Maclin et al. (2017).

⁽¹⁷⁹⁾ Hayes and Perks (2012).

⁽¹⁸⁰⁾ Bashwira and Cuvelier (2019).

⁽¹⁸¹⁾ E.g. Rustad et al. (2016).

⁽¹⁸²⁾ Bashwira et al. (2014).

5.2.1. Mining

The basic work unit is the *creuseur* (digger) team. As virtually all ASM takes place in underground tunnels, these teams are usually attached to a specific pit. Their work is supervised and coordinated by the *chef d'équipe* (team leader), who coordinates the work of the *creuseurs* and is the point of contact of the team with authorities and other stakeholders. Part of the team goes underground to extract material while the other part of the team stays above ground to hoist the material up, dispose of sterile during pit excavations and watch over the extracted material. Teams dig through the overburden until they reach a mineral vein, which they will then follow regardless of depth. At some point pumps might have to be brought in to pump air into and/or water out of the galleries. As work on the site is uncoordinated and unplanned, a pit's underground galleries can merge with others. This not only creates conflict between the teams (conflicts that are adjudicated either by the cooperative(s) or by the Saemape agents on site), but also further destabilises the tunnels.

Creuseurs live hand to mouth and generally do not have any spare income available to live on while they dig through the overburden or to hire pumps. Pre-financiers, called *sponsors*, offset this lack of resources by covering the expenses of the *creuseurs* until they are able to sell their production. Typically, they will do so in exchange for 30–50% of the production. The extracted material is transported within the sites either on the backs of miners or on the bikes of transporters.

If required, this material is then concentrated through washing and sorting. Surface activities are undertaken principally by women and the younger workers. Washing, a back-breaking manual activity, is done either in rivers or more rarely in ponds dug out for this purpose, where sieves are used to remove non-2C-bearing earth. Visual sorting of minerals can also take place, either after or before the washing depending on the type of minerals found on site.

On certain sites, hand-picking activities take place. In this case, miners scour piles of discarded material (overburden, tailings or mixed materials) in order to find rocks with sufficient 2C content. Because of the selectivity of the process, washing of hand-picked material is rarely undertaken. Furthermore, because of the more limited quantities produced, hand-picked material is generally sold on site. Being a less strenuous but also less productive form of mineral extraction, washing, sorting and hand-picking activities are often undertaken by women and the

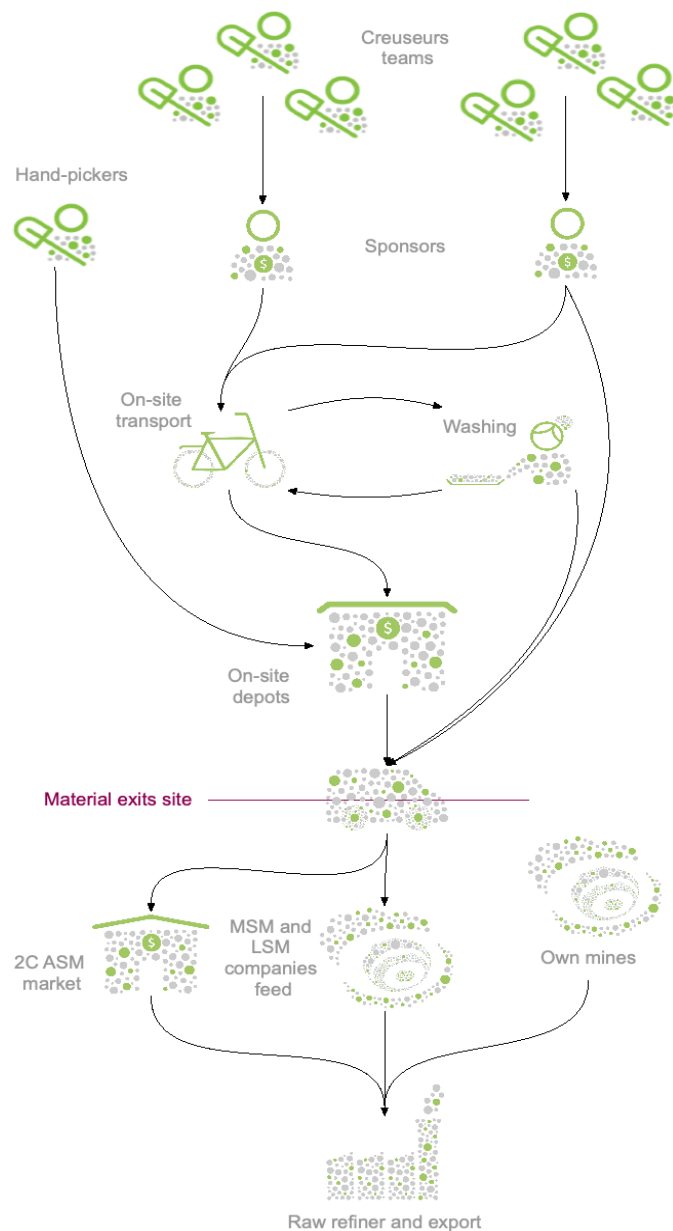


Figure 9 2C ASM supply chain



Picture 4 2C ore washers

younger workers.

Generally, neither *creuseurs* nor washers or transporters make a good living despite undertaking high-risk, high-exposure and high-impact work. BGR (2019) summarises the conditions on ASM sites succinctly ⁽¹⁸³⁾: 'The working conditions of most miners were found to be unacceptable. Apart from the fact that they are in informal employment, the majority of the miners surveyed (40 %) earn less than the national minimum wage of about \$5 per day. If one takes into account the almost universal complaints registered by the field teams regard unfair pricing practices and generally low purchase prices on the part of the intermediaries and depots, as well as the sometimes high tax demands of cooperatives and tax extortion on road barriers, it is easy to identify the causes of such grievances. The fact that this poorly paid work usually takes more than eight hours a day without adequate safety precautions and protective equipment underscores this assessment' ⁽¹⁸⁴⁾.

5.2.2. Trading and export

Once the material is extracted from the pit, and if necessary washed, it will be transported to buying centres within or next to the site, to specific clients or to market hubs such as the Musompo or Kisanfu market. The Kisanfu market was recently destroyed by the FARDC in a crackdown on illegal mining within the nearby Tenke Fungurume Mining concession ⁽¹⁸⁵⁾. These markets can be either loose or dense agglomerations of buying houses (*dépôts*).

Transport often uses bikes within the sites and mechanised vehicles (motorbikes, personal cars, vans, small flatbed trucks) to reach the buyers or markets located outside the sites.

Typically, at the point of purchase only the weight, ore content, and sometimes level of radioactivity of the product are tested. The origin of the material is not a consideration for buyers, unless one of their buyers requires this information. Testing of 2C content is done using portable X-ray fluorescence instruments, locally referred to as *Metorex*.

Creuseurs regularly complain of the price they are offered at these points of sale. They often complain not so much about the prices themselves but rather about the perceived cheating during the weighing and testing of the mineral content ⁽¹⁸⁶⁾. This cheating is perceived as being much greater on sites where a buyer or a group of buyers acts as a monopsony. It is not uncommon to hear miners say that a certain shop 'offre une meilleure teneur' (offers a better measured content).

Exporters of 2Cs, operators that have raw refining capacity, can source their material from a number of sources ⁽¹⁸⁷⁾. Some of them negatively affect traceability of the materials, and in certain cases raw refiners can end up buying material extracted from their own titles. These sources can include:

1. Own mining operations, which can be located either on a title they own or on an SOE title they operate on within the framework of a contract.
2. ASM operators delivering material directly from ASM sites.
3. ASM markets, either directly from sending agents or through intermediaries.
4. Other mining operators that either do not have their own refining capacity or focus on copper. These operators can also buy material from ASM operators or ASM markets.
5. Tailings of material sourced for its copper content, from any of the aforementioned sources, and already processed for copper extraction.



Picture 5 A street in Musompo market

⁽¹⁸³⁾ BGR (2019, p. 42) Note that prices are much higher in Kolwezi and the income needed to get a household through the day (housing, food, schooling, etc.) can be approximately USD 10-15 according to local CSOs.

⁽¹⁸⁴⁾ BGR (2019, p. 42).

⁽¹⁸⁵⁾ ONG Espoir (2019a).

⁽¹⁸⁶⁾ These allegations cannot be verified within the scope of the current project.

⁽¹⁸⁷⁾ OECD (2019).

The fact that most ASM production is exported, despite the fact that no ASM operator has the capacity to refine raw cobalt-bearing material into an exportable commodity, demonstrates that the entirety of ASM production is integrated into industrial channels one way or another ⁽¹⁸⁸⁾. As Enough (2018) notes: ‘Some LSM companies in cobalt mining areas are well known by miners for their practices of buying artisanal minerals and exporting them under an industrial label. Civil society activists in Kolwezi noted that many of these companies hardly warrant the word “mining company.” They’re mostly running ASM export businesses that they export as industrially-mined minerals. By either allowing artisanal miners to dig on their industrial concessions and then logging the minerals as part of their own production, or else purchasing minerals from artisanal miners elsewhere and incorporating them into their own supply, some LSM companies are able to mask the true origins of their minerals.’ ⁽¹⁸⁹⁾.

5.3. Existing systems

This section presents the key characteristics of the two selected systems concerned with the production or supply of responsible ASM cobalt: Better Mining and the Mutoshi Cobalt Pilot. As mentioned in the previous chapter, these are the only initiatives that had been implemented for at least 1 year at the time of the study, and had thus had enough time to generate some level of impact. The scopes and methods of these initiatives vary markedly and their definition of ‘responsible’ can also change, although they are based on the OECD Guidance.

5.3.1. Better Mining and Kasulo site

Implemented in the Kasulo ZEA (ZEA 786) by the globally operating consulting and audit group RCS Global Group, Better Mining is a site-monitoring solution that generates monthly incident reports and corrective action plans (CAPs) for its implementer, Congo Dongfang International Mining (CDM). CDM is the Congolese subsidiary of Huayou Cobalt Co., Ltd.

The Kasulo ZEA is composed of two sites: Kasulo 1 and Kasulo 2. It is owned by the Provincial Government of Lualaba, which has granted CDM an exclusive right to buy the production from the ZEA. The cooperative present on site is the Coopérative Minière Kupanga (Comiku), which according to Saemape documents consulted is represented by a direct relative of the Governor of Lualaba.

Better Mining started its implementation in Kasulo with a 6-month pilot phase, which started in June 2018, before being fully implemented from January 2019 onwards. Unlike the Better Sourcing Program (also implemented by RCS Global Group), Better Mining as implemented in Kasulo is solely focused on information collection, CAP preparation and dissemination. It does not provide any form of traceability: the information it provides characterises the site level and not any material. The implementation of Better Mining is paid for entirely by the operators using it. In the Kasulo site CDM is thus wholly financing the deployment of the system.



Pictures 6 Views of Kasulo site



⁽¹⁸⁸⁾ An exception could be noted in the form of limited direct undeclared and unchecked exports of ore to Zambia under the protection of the GR. This form of smuggling was noted in 2016 by a number of Congolese CSO stakeholders and border guards. It is unknown, however, how extensive this trade was and how much of it continues to this day.

⁽¹⁸⁹⁾ Enough (2018), p. 12

The information collected focuses on incidents and risks as well as relevant contextual information (price of cobalt outside the site, for example). Risks and incidents are based on the Better Sourcing Program Standard v6 (2016), a standard that is based on the OECD Guidance ⁽¹⁹⁰⁾. This information collection is done through site-based trained Better Mining staff equipped with a dedicated app on their smartphones. Once the information is collected, it is analysed by the RCS Global Group staff, who then identify underlying systematic causes and issue the CAPs. Better Mining does not implement any of the corrective measures from the CAPs, but monitors the implementation of the CAPs. For high-risk incidents, the implementer receives an immediate alert in addition to the monthly incident report and CAPs.

The deployment of Better Mining at Kasulo is limited to monitoring; long-term planning and implementation of mitigation measures are the responsibility of the operator (CDM) and the state agency (Saemape). Better Mining in Kasulo can thus be considered the monitoring component of a wider initiative and has limited leverage with the implementer.

Prior to its transformation into a ZEA in August 2017, Kasulo was an urban neighbourhood where mining was taking place between houses, in gardens and even within homes. This complete overlap of mining and habitation zones resulted in high numbers of children on site and endemic child labour issues. It also represented a non-negligible accident risk to the local community due to the potential for falls into pits, and caused occasional building collapses. As part of the transformation process, the neighbourhood has been evacuated, all buildings destroyed and the area walled off. During the process a number of issues relating to relocation emerged (see Section 5.5.9). These issues predate the implementation of Better Mining.

Access to the site is now only possible through dedicated doors, which are under supervision at all times. While in theory access to the site is conditional on the presentation of a Comiku membership card, this demand has been downgraded to the need to present a document certifying that the individual is over 18 years old, as no membership cards have been distributed outside Comiku’s management. According to Comiku there were at the time of the visit about 1 300 *creuseurs* working on site, all male (180 of them work on Kasulo 2 and 1 115 on Kasulo 1). This is a significant decrease from the presence of 5 000 to 14 000 miners on site prior to its transformation into a ZEA.



Picture 7 Washing basin in Kasulo

Part of the site has benefited from overburden removal (see Pictures 8, bottom), which has targeted the areas considered at highest risk based on Saemape structural integrity assessments. Thanks to this measure as well as more thorough site monitoring by Saemape, encouraged by the monitoring and released CAPs, there have been no fatalities on site in the year up to the site visit.

Three dedicated washing basins have also been dug out within Kasulo 2, where 20 washers, all female, operate. These basins are individually filled with water and, once silted and dry, the tailings are removed. This avoids the washing of ores directly in the Dilala river, which previously took place. The washing basins are then refilled.

Once extracted, the product is transported to the different *dépôts* present on site. Material from Kasulo 2 is washed prior to being sent to the *dépôts*. At the time of the visit there were seven such *dépôts*, each with its own testing area and personnel. These *dépôts* can only sell to CDM. CDM then fills its trucks, which head to the company’s raw refining plant located in Lubumbashi.

⁽¹⁹⁰⁾ BSR (2016).

In a nutshell

CDM has been granted the exclusive right to purchase minerals from the Kasulo site by the Government of Lualaba, the title owner. It purchases minerals through traders present on site.

Paid by CDM, Better Mining monitors the site, documents incidents and analyses the information to find the root cause of the incidents. It also prepares incident reports for CDM as well as corresponding CAPs for implementation, and monitors the implementation of the CAPs. Better Mining does not train stakeholders, provide traceability or implement the suggested CAPs. CDM, Comiku and Saemape jointly implement the CAPs.

5.3.2. Mutoshi Cobalt Pilot

In contrast to Better Mining at Kasulo, the Mutoshi Cobalt Pilot (MCP) implemented by the international NGO Pact⁽¹⁹¹⁾ is implemented not on a ZEA but on an LSM title (PE 2604) owned by Gécamines and leased to the mining and processing company Chemaf, part of the Shalina Group. The pilot makes use of provisions in the Congolese mining code that allow permit holders to authorise ASM activities on parts of their concessions. However, the exact nature of the arrangement remains unknown, as these documents are not in the public sphere and the information is kept by Chemaf. The cooperative present on site is the Coopérative Minière Artisanale de Kolwezi (Comiakol).

Unlike Better Mining (a template solution then tailored to the specifics of both sites and implementers), the MCP has been developed specifically for the site and to operationalise the demands for responsible ASM sourcing made by the MCP material buyer to the MCP operator.

In 2018, the trading company Trafigura Group Pte Ltd entered a 3-year cobalt hydroxide off-take agreement with Chemaf⁽¹⁹²⁾. One of the conditions of the agreement was alignment with Trafigura's Corporate Responsibility Policy and its Responsible Sourcing and Supply Chain Expectations, as well as with the OECD Guidance.

As a result of this agreement Chemaf works with Comiakol, as a subcontractor working on the MCP, the ASM site. In parallel, Trafigura has contracted Pact to support the efforts of Chemaf in working responsibly with the ASM miners on the pilot. Saemape is integrated into these efforts and, while the PMH is present on the pilot site, its relationship is at the title level with Chemaf and not directly with the pilot.

⁽¹⁹¹⁾ <https://www.pactworld.org/>.

⁽¹⁹²⁾ Trafigura (n.d).

Mutoshi and the Mutoshi Cobalt Pilot

While they share part of the same name and of the same location, a clear distinction should be drawn between Mutoshi and the MCP. The former is the name used by local stakeholders to refer to both a neighbourhood of Kolwezi and the adjacent titles on which Chemaf operates. These titles include a number of ASM sites that are not formalised and where issues of child labour, life-threatening OHS and the presence of armed forces have been reported by ASM miners and CSOs.

The MCP meanwhile is a small subset of the Mutoshi titles and is not related to the rest of the title in its operations (with the exception of the buying centre).

Note that the results of our analysis concern solely the pilot site of the MCP.



Pictures 8 Views of Mutoshi ASM site



Pact's role within the project is to support and facilitate the collaboration between Chemaf, Comiakol and the ASM miners. It does so by:

1. supporting site monitoring and reporting information on incidents to Chemaf;
2. supporting Chemaf and Comiakol with its technical knowledge of ASM and of downstream demands;
3. working jointly with Chemaf and Comiakol on adapted community outreach;
4. raising hazard awareness and safety management capacity among ASM miners, jointly with Chemaf and Comiakol.

The Chemaf title includes not only the pilot area, but also villages, farmland and a mineral-buying centre managed by Chemaf and located 11 km away from the pilot site, as well as informal ASM sites. Chemaf is also constructing a refining plant on the title. According to communities consulted, Chemaf is undertaking exploration in some areas of the title.

The pilot site is located on an area previously developed as an informal ASM site for a number of years and next to the neighbourhood of Mutoshi. Prior to the start of the project, the pilot area was a site pockmarked with deep tunnels, some of them more than 50 m deep. The pilot site is now divided into an extraction area, two washing areas, a temporary storage area and a tailings area (where the cobalt-containing overburden and silt from the washing basins are stored until completion of the local processing plant).

The entire pilot area, while not fenced off the rest of the site, is nevertheless inaccessible from the community. Miners who wish to enter the site must do so using designated gates, where their membership cards are verified, a requisite to enter the site, and miners entering are counted every day. An official listing of prices for cobalt at the buying centre is shown, in US dollars per tonne of material and for various mineral grades. In addition to their membership cards, miners have to be wearing PPE and closed shoes to enter the site. Overalls and hard hats are offered free of charge to the members; some members also use gloves or rubber boots depending on their tasks.

At the time of the visit, Comiakol counted 4 083 registered *creuseurs*, 142 registered washers, 364 male mineral buyers, 228 female mineral buyers and 98 *mobiles* (cooperative members in charge of overseeing the site).

Between 8 and 12 m of overburden has been cleared from the extraction area (see Pictures 9 and 10), making the deposit immediately accessible to *creuseurs*. *Creuseurs* have to limit the depth of their excavations to 6 m and proceed strictly vertically, as pits must not branch into tunnels. Compliance with these rules is monitored by a combination of Saemape agents and *mobiles*. Once a sufficient number of pits have reached their maximum depth, the site is once again levelled out with the use of machinery and the cycle starts anew. At the time of the visit, overburden removal was mentioned as having fallen behind schedule owing to cash-flow concerns at the Chemaf level. Those concerns also affected the capacity of the buying centre to pay miners on the spot, which led to a drop in the number of miners coming to the site.

Once the mineral is extracted from the open pit area it is transported on bikes either to washing pits or directly to the temporary storage area. Washing takes place in 14 dedicated washing basins. These are filled with water and left to dry once they are silted, before being re-excavated. Basin tailings are stored aside in an area that also receives the cobalt-containing overburden, where a few miners perform hand-picking. Material is then stored



Picture 9 Work on the MCP



Picture 10 Washing basin at MCP

until a team has enough material to send it to Chemaf's buying station using private cars and vans contracted by the traders. There the material is weighted and its cobalt and moisture content are determined. Teams are then paid accordingly and material is packed into big bags that at the time of the field visit went directly to Chemaf's Usoke processing plant in Lubumbashi, a plant that only treats ASM material ⁽¹⁹³⁾.

In a nutshell

Trafigura has an off-take agreement with Chemaf. Chemaf implements the MCP on a small part of its Mutoshi site. To do so it works with Comiakol and Saemape. All cobalt produced by the MCP is purchased by Chemaf and then Trafigura.

Paid by Trafigura, Pact provides technical support to the MCP by (i) supporting site monitoring and reporting information on incidents to Chemaf; (ii) sharing its technical knowledge of ASM and of downstream demands; (iii) community outreach; (iv) raising hazard awareness and safety management capacity among ASM miners. These actions are implemented jointly by Pact, Chemaf and Comiakol as well as Saemape.

5.4. Methodology used for the analysis of pilot projects

The analysis below is based on a comparison of the visited pilot projects with the general conditions of the 2C ASM sector in Lualaba and Haut-Katanga (as described in Sections 5.1 to 5.4). This approach has been chosen in the absence of an available baseline of the pilot sites prior to the implementation of the systems. Moreover, it was necessary to develop a robust rather than refined methodology that could weather out missing data and integrate the wide range of sometimes conflicting estimates given by different actors. Results from this approach are presented in Section 5.5.

The characterisations of pilot sites and of the 2C ASM sector are based on information collected through the information matrices on which this analysis is based. As most of this information is qualitative and suffers from significant loss of quality and meaning when turned into quantitative indicators, it has been kept in its qualitative form.

Information matrices have been chosen as a replacement for questionnaires, as a significant part of the supply chain remains non-formal (illegal, informal, outside applicable legal norms or with regulations applied selectively as a norm). Stakeholders therefore respond poorly to structured questionnaires, which are too thorough and too often make stakeholders confront their non-formality, which does not allow the establishing of the interpersonal trust necessary to obtain information on non-formal activities. These matrices are based on the OECD Guidance, the IFC PS and the CCCMC Guidance, as described in the previous chapter. The methodology used to develop the information matrices is presented in Annex 4.

Information collected for the filling of the information matrices has been collected through secondary sources (listed in Annex 4), phone interviews, in-person interviews, and direct observation in and around mine-sites. Interviews have been conducted over the phone and in person with a diverse range of stakeholders:

- subject matter experts not affiliated to a CSO (5),
- initiative implementers (3),
- community representatives (12),
- children ex-workers from neighbouring communities (15),
- representatives from CSOs (10),
- ASM miners from the pilot sites and ASM miners' representatives (6),
- government agencies' representatives (2).











In-country work was undertaken between 30 September and 8 October 2019 in Lubumbashi and Kolwezi.

⁽¹⁹³⁾ Trafigura (n.d).

Section-specific colour coding

In this section, dedicated colour coding is used to summarise information under each heading. The summarised information describes the level of change observed on site compared with the rest of the sector, and the level of influence the system has on that situation.

Table 18 Colour coding used in the assessment

Situation in 2C ASM sector at large	
	No noted risks
	No noted risks, related issues remain
	Not applicable (absence of underlying factors)
	Systematic abuses
	Systematic and grave abuses
Situation on site compared with baseline	
	Major improvement
	Improvement
	No change
Influence of system on situation	
	Direct
	Through the initiative
No border	Unknown

Furthermore, visits on the two pilot sites have been conducted under the guidance of multiple representatives of the initiative implementers, the operators, the deployed Saemape agents and the assigned cooperatives (13 or 14 people in total depending on the pilot site). Because of the pervasive presence of officials, ASM miners were interviewed at a different time and in a neutral location.

This information gathering was complemented by a visit to a third ASM site, where no pilot was implemented. This site was chosen as representative of the general 2C ASM sector according to stakeholders consulted. This site will remain unnamed, as access to the site was conditional on anonymity.

5.5. Evidence from the sites

It is necessary to stress that neither Better Mining nor the Pact Mutoshi pilot operates in a vacuum or only by itself. Both approaches are part of broader initiatives implemented on site and coordinate their work with the mining operator, the miners, the cooperatives, the state agencies and, in the case of Mutoshi, the initiative's financier. This has significant implications when it comes to assessing the impacts of these systems individually and not as part of the broader initiatives they are a part of. In most cases, it is not possible to disentangle the working of the broader initiative from the influence a system may have had on these initiatives. This is because those systems have limited direct implementation capacity. Rather, they are instruments that implement or reinforce and when necessary reorient the managing systems of the operators so as to achieve a particular set of objectives, i.e. alignment with the demands of the OECD Guidance and applicable best practice. In other words, they indirectly affect the observed issues by playing their role in the initiatives they are a part of.























It should also be noted that both systems are implemented by LSM operators⁽¹⁹⁴⁾, which already have substantial management systems in place. There is therefore less room for these systems to have a more direct impact by prompting the adoption of management systems rather than reinforcing, correcting and reorienting existing management systems and procedures.

Coupled with the lack of a pre-implementation baseline, this makes assessing the impact of these systems extremely complex and fraught with errors. In order to avoid these pitfalls, the analysis is limited to highlighting, in addition to the level of change, whether the system could influence the situation on the pilot site if the other elements of the initiative were not present (**direct impact**) or the system's impact is wholly dependent on the other elements of the initiatives, which would not have the same level of impact, if any, without the presence of the system (impact **through the initiative**).

These elements are reflected in the colour coding of Table 19, and of the section headings below.

⁽¹⁹⁴⁾ CDM, in addition to its ASM sourcing, operates its own LSM assets.

Table 19 Results of pilots' assessment since implementation of the RS system. Summary table

Category	2C ASM sector	Kasulo	Mutoshi
Presence of armed groups	Not applicable		
Presence of armed forces			
Serious human rights violations			
Forced labour			
Worst forms of child labour			
Corruption and bribery (at the level of the ASM miners)			
Misdeclaration of origin of minerals		Contingent on operator's declarations	
Payment of taxes			
Displacement and resettlement			
Occupational health and safety			
Environmental and public health impacts			
Indigenous peoples	Not applicable		
Minorities and discrimination			
Gender			

In line with the methodology presented in Section 5.4, the sections presented below and summarised in Table 19 reflect the risks listed in the OECD Guidance, the IFC PS and the CCCMC Guidance.

At the risk of repeating ourselves, these results should be read while bearing in mind the scope of interventions of the systems.

Better Mining, for example, only makes recommendations and is not in charge of implementing changes or providing any sort of training to either miners or operator/cooperative/Saemape staff. It can only recommend the training and its focus. Furthermore, its contract is with the operator and not with the off-taker, which reduces leverage when established practices clash with best practices.



Pact, meanwhile, although it has more capacity to implement changes, operates on a pilot that is only a limited area of a much wider mining title. That title has an ongoing history of fraught community relations and tensions, over which the system has no impact. Furthermore, a number of management systems function at the site level, of which the ASM area is a subset. These include key elements such as selection and contracting of private security and long-term community relations planning. Hence it is important to highlight that the MCP should not be confused with the Mutoshi title.

5.5.1. Presence of armed groups

Sector baseline	Kasulo	Mutoshi
N/A		

Compared with the baseline, there is no change in regard to the presence of non-state armed groups on mining sites, along transport roads or at trading points. This risk can be considered minimal under the current circumstances.

5.5.2. Presence of armed forces

Sector baseline	Kasulo	Mutoshi
		



Compared with the baseline, the inappropriate presence of state armed forces is much lower. In neither of the sites was the presence of the FARDC, National Police, GR or any armed forces other than the PMH observed.

In Mutoshi, as in any ASM site in the region, the ANR is rumoured to have agents on the pilot site.

In Kasulo the *Division des Mines* shares its offices with the *renseignement* (intelligence services), as is written on a plaque by the entrance to the office. This was confirmed by local staff. It is understood, based on interviews with miners, that the intelligence services present on site include ANR, Demiap and Bureau 2. However, this could not be confirmed.

While the issue of the presence of intelligence agencies on ASM sites is less clear cut than that of armed forces, the presence of agencies noted for their negative human rights record is nevertheless cause for concern.

5.5.3. Serious human right violations

Sector baseline	Kasulo	Mutoshi
		

No serious human rights violation has been observed directly on the pilot sites. However, protests in the Kasulo neighbourhood adjacent to the site and triggered by the ASM activity on site ⁽¹⁹⁵⁾ turned violent and led to the intervention of armed forces not stationed on site. The intervention resulted in four fatalities, two of them not miners, according to CSO reporting ⁽¹⁹⁶⁾.

Both pilots ensure the absence of non-authorized miners in their operations through fencing/walling, thereby reducing the opportunities for confrontation between armed forces or private security staff present on site and ASM miners. At the same time, on neither of the sites were either security or PMH agents trained on the VPs or ICoC, according to the staff interviewed. In both cases the contract is not established at the pilot level and there is thus a lack of clarity on site about the rationale behind the selection of any particular firm or its human rights track record.

5.5.4. Forced labour

Sector baseline	Kasulo	Mutoshi
	➡	➡

Compared with the baseline, there is no change in the presence of forced labour on sites, along transport roads or at trading points. This risk can be considered minimal under the current circumstances.

5.5.5. Worst forms of child labour

Sector baseline	Kasulo	Mutoshi
	↑↑	↑↑

Compared with the baseline, no cases of child labour or of young adolescents working on sites have been either directly observed or reported by the consulted CSOs or miners.

Both pilot sites seem to rigorously enforce age control systems in order to avoid the presence of minors on sites, with success.

Issues of child labour (hand-picking) on Chemaf’s title have been mentioned by local community children but are not connected to the pilot.

5.5.6. Corruption and bribery

Sector baseline	Kasulo	Mutoshi
	↑↑	↑↑

Compared with the baseline, extortion or requiring miners to pay for services they are owed (such as the services of Saemape) is reported to be minimal or non-existent on these sites, according to miners consulted.

For both Kasulo and the MCP, the granting of mining titles was managed by the respective companies and not by the pilot. This issue is therefore not considered in this analysis.

⁽¹⁹⁵⁾ The exact cause of the protest could not be determined at the time of writing. According to Comiku and CDM staff in Kasulo, the protests were initiated by miners not working on site and protesting against entry requirements, while CSO representatives attribute it to dissatisfaction of Kasulo miners with prices and mineral contents (i.e. perceived incorrect determination of cobalt content) offered on site.

⁽¹⁹⁶⁾ ONG Espoir (2019b).

5.5.7. Misdeclaration of origin of minerals

Sector baseline	Kasulo	Mutoshi
	Contingent on operator's declaration	

The potential issue of misdeclaration of mineral origin is somewhat more complex.

In Kasulo, minerals from outside cannot enter the site without the willing participation of staff. The entire production of the walled-off area is legitimate, as it originates from within the ZEA. Neither CSOs nor miners have mentioned that any mineral production enters from outside the site. It should, however, be noted that CDM does buy minerals from other sites; in particular, its purchase of ASM copper material (which contains amounts of cobalt) is noted as casting a wide net. Therefore, any claims that CDM production is responsibly sourced would have to be treated with caution, as no assurance regarding the conditions of extraction of material that is not from Kasulo or a similarly monitored site could be given. Furthermore, as highlighted, Better Mining does not provide any traceability of materials.

Regarding the Chemaf buying centre located within the Mutoshi title, all stakeholders have mentioned that Chemaf's buying station buys ASM minerals regardless of their origin. In parallel to these claims a small flatbed truck fully loaded with minerals bags was seen entering the Chemaf title, in front of the ASM pilot site. The door was opened by on-site security with no signs of agitation and could move forward without any kind of checks¹⁹⁷

ASM miners and community members consulted all declared that no material can exit the Chemaf title. According to them anyone caught trying to smuggle material out of the title will get his production confiscated and faces a likely beating. Note that these comments applied to production from the informal sites on the title and not the pilot site.

In a nutshell

Issues of misdeclaration of mineral origin are currently not an issue, as neither operator makes claims about the product it sells. Instead, claims are focused on the implementation of initiatives. Issues could potentially emerge if operators started making claims about the characteristics of the specific material they supply, and did so without fully guaranteeing that these claims could be associated with the specific material they were selling to their clients.

5.5.8. Payment of taxes

Sector baseline	Kasulo	Mutoshi
	↑	↑

Payment of taxes is unknown.

Accessing tax information and the contracts that underpin specific tax arrangements (in the case of Kasulo the contract designating the CDM as the unique buyer of minerals in Kasulo, and in the case of Mutoshi the leasing contract between Chemaf and Gécamines) is extremely sensitive in the DRC context and was not possible.

However, these being formal operations, it is extremely likely, although not confirmed, that the pilots pay at least some taxes.

¹⁹⁷ The entrance of the truck could be photographed by the team

5.5.9. Displacement and resettlement

Sector baseline	Kasulo	Mutoshi
	➡	➡

Compared with the baseline, there is no change in the risk of displacement or resettlement, as both systems are implemented on existing sites. The site of Kasulo has experienced issues of displacement in the past but these issues predate the implementation of the Better Mining pilot ⁽¹⁹⁸⁾.

In Mutoshi, issues of resettlement on Chemaf’s title have been mentioned by local community members but are not connected to the pilot.

5.5.10. Occupational health and safety

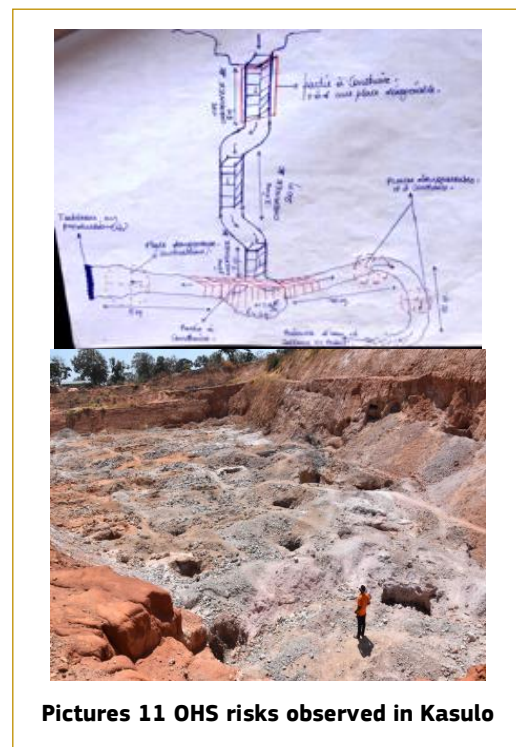
Sector baseline	Kasulo	Mutoshi
	⬆	⬆⬆

Compared with the baseline, the OHS conditions on both sites are significantly better, as neither had recorded any fatalities during the year before the visit, and the level of risks has decreased markedly according to both miners and CSOs consulted ⁽¹⁹⁹⁾. While it is too early to draw conclusions at this stage, this could probably be attributed either to the complete removal of overburden in the case of Mutoshi or to the combination of risk-based localised overburden removal with additional Saemape monitoring in the case of Kasulo.

It is also likely that the long-term impacts of washing activities (urinary tract infections and other gynaecological complications) will decrease or disappear, as precautionary measures (shallow washing ponds) have been implemented on both sites, eliminating the need for washers to stay semi-immersed in mineral-laden water for long periods of time.

However, a number of OHS risks remain.

In Kasulo a number of pits not in production are open and barely marked, which could lead to falls into the 10- to 20-m vertical shafts. The risk, however, is somewhat mitigated by the lack of presence on site at night and the decoupling of the mining area from the neighbourhood. Complete absence of PPE on site can also result in injuries.



Pictures 11 OHS risks observed in Kasulo

⁽¹⁹⁸⁾ It should be noted that the Kasulo resettlement process has been riddled with issues related to appropriate compensation of the people resettled, the compensation of farmers on whose land the resettlement took place or has to take place, and the capacity of households to give meaningful free prior informed consent. This expropriation concerned 544 parcels, whose owners were given 14 days to choose between a cash payment (both the amount and how it was calculated are unknown by CSO informants) and receiving new housing in a rural area 12 km outside Kolwezi with no school or hospital. Concomitantly 326 land owners have had to give up either a part or the totality of their farming land to state agencies to enable the resettlement of the Kasulo inhabitants (both the amount and how it was calculated are unknown by CSO informants). As of early 2018, very few housing units had been constructed and resettled people were complaining not only of the quality of accommodation received but also of their lack of understanding of the process or their rights (Solorn, 2018), thereby vitiating claims that meaningful free prior informed consent was obtained from the communities. While this falls completely outside the purview of Better Mining, as the displacement and resettlement process took place prior to the deployment of the system, members of local CSOs nevertheless stress that in their opinion Better Mining should address this historic legacy. This perceived shortcoming affects their perception of the system.



⁽¹⁹⁹⁾ On a very encouraging note, on the day after the site visit the MPC held a celebration of 1 million hours worked without an incident serious enough to suspend work temporarily.

Furthermore, despite Saemape being much more robustly and effectively involved than usual and the fact that Congolese law limits the depth of underground pits and tunnels to 30 m, this limit is often flouted by miners and despite knowledge of it by SAEMAPE (as illustrated by SAEMAPE own pit diagrams, see Pictures 11), work continues unopposed.

On both sites there is a noted absence of mine-dust protection, despite the known long-term effects of dust on ASM miners ⁽²⁰⁰⁾. This risk is potentially higher in Mutoshi because of the nature of the deposit (hard rock) and the open pit design of the site, generating higher levels of dust. Long-term impacts of digging, transport and washing activities that can result in back pain and other forms of reduced mobility at an older age are also not addressed in either site. These can be a significant burden for miners in their later life, as no social safety net is in place.

Life-threatening OHS issues on Chemaf’s title have been mentioned by local community representatives and CSOs, and observed by the team, but are not connected to the pilot.

5.5.11. Environmental and public health impacts

Sector baseline	Kasulo	Mutoshi
		

Compared with the baseline, environmental impacts are mitigated. Indeed, the main direct environmental impact of ASM sites, the pollution of river and streams due to the washing process, does not occur, thanks to the use of washing basins. As these basins are not connected to any stream or river, they do not generate any such pollution. Once silted and dried, the silt is either discarded or stored for processing as low-content ore.



Other environmental impacts, related to the generation of dust and of greenhouse gases due to transport, could not be assessed within the scope of the study and are also too complex to pin on a single source.

5.5.12. Indigenous peoples’ rights

Sector baseline	Kasulo	Mutoshi
N/A		



Compared with the baseline, there is no change in impacts on and risks to indigenous communities. This risk can be considered minimal under the current circumstances.

5.5.13. Minorities and discrimination

Sector baseline	Kasulo	Mutoshi
		

Compared with the baseline. there is no change in regard to issues of discrimination. This risk can be considered minimal under the current circumstances.

5.5.14. Gender

Sector baseline	Kasulo	Mutoshi
		

⁽²⁰⁰⁾ Kabamba et al. (2016).

Compared with the baseline, the situation in Kasulo is unchanged.

In Mutoshi, however, about 7–10% of diggers are female, a visible departure from the strict gender separation of roles observed on most sites. This can be linked to the open-pit nature of the site, as CSOs and Saemape agents consulted have linked the work of women as diggers to the lack of underground work, of which women are not capable according to these sources.

5.5.15. Other considerations

The implementation of both Better Mining and the MCP seems to have produced positive changes to the conditions on site, but they also have created or exacerbated some issues of their own, according to CSOs and miners consulted. These issues are not reflected in the human rights risk indicators used in most due diligence or risk-mapping efforts, as these are not strictly covered by the reference standards.

It should be noted that the potential issues presented below for the most part stand outside the scope of the analysed systems, in part due to the latter's focus on the OECD Guidance. Moreover, given the lack of available channels to seek redress or influence on the sector, both CSOs and miners tend to make demands upon systems that may either be loosely connected to the scope of these systems or go over and beyond their scope.

While, once again, it is too early to draw anything but very preliminary insights, the governance context of the DRC means that such worries should nevertheless be carefully taken into account by actors engaging with responsible cobalt-sourcing initiatives.

- **Miners' income**

Miners do not earn a salary and instead their income depends on their daily production. Its value is determined not only by the volume of ore they extract but also by its cobalt (or copper) content, as well as international prices. In certain buying stations, the moisture content of the ore is also taken into account.

With the exception of the Chemaf buying centre, located in the Chemaf title, prices are somewhat similar across all markets, as illustrated in Figure 10.

As noted earlier (see Section 5.2), miners regularly express their unhappiness with their earnings, although this is directed not as much at mineral prices as at the perception that they are cheated during mineral content determination and weighting. This led to recent protests at both sites ⁽²⁰¹⁾, which in the case of Kasulo

turned violent and led to four fatalities, as noted in Section 5.5.3. According to Comiku and CDM staff in Kasulo, the protests were initiated by miners who did not work on site and local miners were defending the site. The most accurate narrative could not be identified at this time.

As part of their operations, both sites limit mineral buyers on their sites and do not allow material to be sold outside, thus creating monopsonies. ASM miners perceive these as more prone to cheating, as they cannot have their material assessed on the open market and thus find a buyer offering them a measurement of mineral content that is closer to what they believe is correct. The accuracy of the mineral content determination could not be tested.

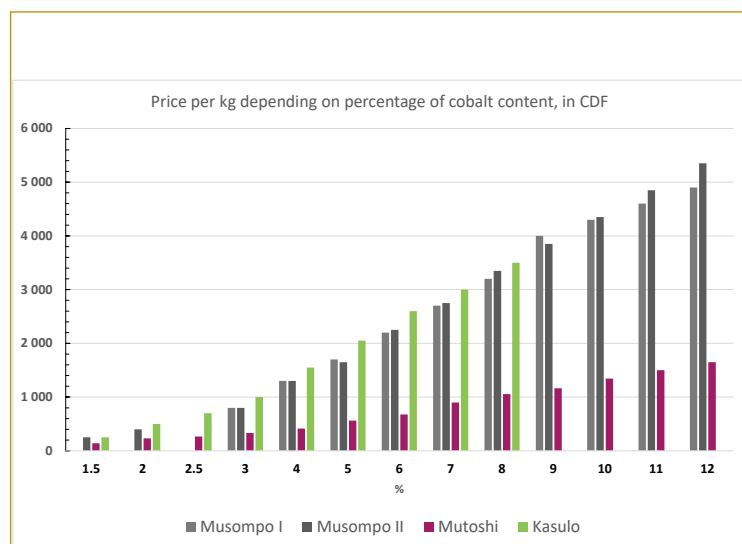


Figure 10 Cobalt price comparison

Note: Graph based on normalised prices (initial prices were expressed in Congolese francs or in US dollars per kg, 100 kg or tonne) collected in two buying centres in Musompo, in a Kasulo buying house and from the prices listed at the entrance to the Mutoshi pilot. These prices were collected over a 2-week period, and might thus reflect some variation linked to international metal price fluctuations.

⁽²⁰¹⁾ Elavox (2019); ONG Espoir (2019b).

Scales have also been highlighted as another way to cheat miners, in particular when few competing buyers are present. Testing of these scales has shown a ± 2 -kg fluctuation, well short of the discrepancies of more than 15 kg sometimes reported.

While pay level is not part of the standards that are applied when performing human rights due diligence in the sector, it is undoubtedly a major determinant of the living conditions of miners. Furthermore, perceived injustices can lead to protests and the involvement of Congolese armed forces, which are not trained in the VPs and have often committed human right violations when confronting ASM miners ⁽²⁰²⁾.

In this respect, it is encouraging to note that Better Mining includes as part of its approach information on the prices found in Musompo market in its reporting to CDM.

- **Cooperatives**

Working with a cooperative is necessary both legally and organisationally but there are concerns surrounding the fact that cooperatives do not operate in line with cooperative principles. They are thus at best a form of organisation that is not accountable to its 'members' or governed by them, and can at worst be a form of organisational structure that extracts revenue from ASM miners without providing them with any benefit, save for the authorisation to work on a site. In that regard the assignation of cooperatives to specific sites through decrees is also a non-transparent procedure that raises a number of red flags, especially as the involvement of PEPs in cooperatives is the rule rather than the exception.

The cooperatives assigned to both sites are backed/owned by PEPs, according to CSOs consulted. While this cannot be substantiated in the case of Comiakol, consultation of a Saemape document on registered cooperatives shows that the representative of Comiku is a relative of the Governor of Lualaba. Furthermore, according to CSOs and miners consulted, the assignation of Comiku on Kasulo displaced an existing *comité de creuseurs* that was previously on site. Such committees are typically local 'cooperatives' that lack the resources to be formalised as such but might be more legitimate locally, as they are often started by miners who are directly involved in the site.

According to stakeholders consulted, Comiakol was also a *comité de creuseurs* before Pact supported it in its registration as a fully fledged cooperative.

- **Misleading claims of origin/impact**

There are concerns among CSOs consulted that the current efforts made and/or financed by private actors in the cobalt supply chain, while having a positive impact on the sites where they are implemented, might be used as a way to whitewash the entire production, sourcing or image of the implementer. This could happen either by association or through unclear or confusing communication about the characteristics of the operators' cobalt production or sourcing. This concern is more acute regarding actors that use a number of different ASM sources, which do not operate under the same standards as the sites where initiatives are piloted.

This is similar to the criticism of downstream users of the Better Gold Initiative (BGI), a number of whom made claims about the nature of their gold sourcing that were disproportionate to the size of their actual sourcing of BGI material. In other words, 'BGI has been singled out as allowing the Swiss gold smelting industry to enhance their image to an extent that is not in line with BGI's contribution to their production' ⁽²⁰³⁾.

- **Transparency**

Civil society representatives point out that there remain high obstacles to accessing information regarding the sites on which the pilots are implemented.

Indeed, barely any information is accessible without direct contact with project implementers, even when it is not commercially sensitive. That is a difficult hurdle for CSOs to clear. Similarly, site visits are very difficult to organise for these stakeholders, they report.

A number of documents that should have been made public in accordance with Congolese regulations and policies remain inaccessible. For example, and much to the dismay of local CSOs, the content of the agreement between CDM and the provincial authorities as it relates to the operation of Kasulo is not known, including the information relating to payments to authorities both for taxation purposes and for service

⁽²⁰²⁾ ONG Espoir (2019a,b).

⁽²⁰³⁾ Strade (2018).

delivery (presence of the PMH and of Saemape on site). The exact nature of the arrangement that allows Chemaf to work with ASM miners on its site is also unknown and, while the Congolese Mining Code contains legal clauses that allow it, local CSOs complain that they are not able to access that information.

- **Historical grievances**

That responsible sourcing systems do not seek redress for historical grievances on sites is seen as a shortcoming of the responsible sourcing efforts deployed by the systems, and affects local stakeholders' perceptions of the systems.

The case of the troublesome resettlement of Kasulo has been cited by a number of CSO representatives as an example of these unaddressed grievances.

5.6. Main findings of the chapter

As presented in Section 5.5, both Better Mining and the MCP have triggered or catalysed positive changes in their pilots.

As the summary tables show, systems are very dependent on the initiatives they are a part of. This is more obvious for Better Mining, as the system's scope is limited to reporting and creating CAPs, whereas the MCP's direct engagement with miners and the local community gives it some additional measure of direct impact on miners and communities. The more integrated a system becomes within an initiative, the better it can support impact. However, it then becomes more difficult to disentangle the impacts the system has by itself from those of the initiative.

An additional advantage of the MCP over Better Mining when it comes to implementing changes is that its client is the off-taker and not the operator. This means stronger leverage when ongoing practices must be aligned with international best practices (including the OECD Guidance), as the producer is contractually tied to the off-taker and its responsible sourcing demands.

The systems analysed operate in very complex environments and require to be analysed within the context of the relevant environment to be understood. Changes will take time to manifest, and tenacious issues will probably only be solved by repetitive iteration and gradual correction. For example, fostering something as simple as the use of PPE on site has taken months for the MCP.

Being commercially funded, neither system depends on continued disbursement of public money for continuing implementation, but instead they depend on cobalt prices remaining over a certain threshold. Downturns in the price of the metal will affect the profitability of the operations and may lead to either a downsizing or a freeze of the initiative or the systems' implementation.

Being integrated into commercial initiatives, the systems can suffer from the initiatives' need to be profitable, which can affect the prices initiatives offer to *creuseurs* and can lead to frictions not only with ASM miners but also with the CSOs representing them. (Perceived) misevaluation of mineral content is a particularly damning practice in the eyes of the miners and damages confidence substantially.

While the issue of price is, strictly speaking, outside the focus of these systems and rather falls under the initiatives that implement them, it has become apparent during the course of fieldwork that stakeholders, and CSOs in particular, seldom make a distinction between the two. Similarly, in the case of Mutoshi, the issues Chemaf may have with communities on its titles are easily transferred to the MCP in the discourse of local stakeholders. This lack of clear differentiation makes any potential issue of whitewashing of operations as a whole, through participation in responsible sourcing initiatives, all the more relevant to these stakeholders.

Reminder: systems, initiatives, sites, titles and pilots

System refers to the purpose-designed management and/or technological tools that aim to support the responsible sourcing of cobalt.

Initiative refers to concrete responsible cobalt-sourcing programmes currently deployed on the ground, which include a system as a component.

Site refers to the dedicated ASM area (including the extraction, washing and temporary storage subareas).

Title refers to the entirety of the mining title, of which the site might only be a part.

Pilot refers to the implementation of an initiative on a site. If the initiative has been tailored to the specifics of a site, then the term 'pilot' encapsulates those changes.

Historical grievances, such as those created by the Kasulo resettlement, can take up a lot of space in discourse. Failure to address them (even if redressing these grievances is completely outside the scope of the system or even the initiative) creates shortcomings, in the perception of certain categories of stakeholders, particularly CSOs and miners. This should not come as a surprise, as for these stakeholders, with very few avenues available to seek redress, the initiatives represent a possible solution and expectation are high, which can complicate operations. Open and transparent communication and expectation management are thus key to addressing these issues.

Association with a cooperative is a precondition to the implementation of any system integrating ASM production, but is fraught with potential issues as most of these have very close relationships with PEPs. Existing mining cooperatives in the DRC make use of a two-tiered system of membership that does not grant membership benefits to members that have not contributed to the capital of the cooperative. These “members” are usually the ones undertaking the manual labour on site and the most likely to migrate from on site to another in response to local (changes in security enforcement) or global (variation of copper and cobalt prices) shifts. It is unclear what the effects of creating a cooperative with a strict “one member, one vote” policy from the bottom up would be or how existing actors would respond to its creation.

The imposition of additional demands on ZC producers, and in particular ASM producers, risks further entrenching already established actors while at the same time stifling the development of small producers with few connections, as they are unlikely to be able to adapt to these new demands. These smaller actors are at a disadvantage, as they may have neither the understanding of international demands required to swiftly adapt nor the financial capacity or connections necessary to implement the required changes. This could further concentrate the control of the ASM sector among a few already well-placed players⁽²⁰⁴⁾, some of whom may be PEPs or be connected to them.

This roll-out of initiatives, while producing desirable outcomes, might also disincentivise Congolese authorities from intervening or investing in the sector, thus leading to the subcontracting of what are implicitly state functions, such as the monitoring and development of the ASM sector.

Critically, there appears to be a significant disconnect between what ASM miners perceive as better working conditions and the demands of international standards. ASM miners are focused on day-to-day survival, and for them issues such as pay and fair determination of mineral content take centre stage. Such elements are not taken into account by current approaches, as they are driven by downstream demands. It is thus necessary to expand the scope of these approaches to incorporate key demands from the upstream actors they are supposed to support. That could be implemented within the framework of the five-step approach of the OECD Guidance.

Finally, it should be noted that, while in the public perception many opportunities for responsible cobalt sourcing exist, in practice this is far from the case. Few systems are actively implemented on the ground, and half of the systems implemented exclude ASM by design. At the time of this report’s preparation, only two systems were implemented on producing sites that work with ASM, so only two or three ASM sites were operating under responsible cobalt-sourcing initiatives, a fraction of the DRC’s ASM sector. It is unlikely that the supply of responsibly produced cobalt that incorporates ASM could surge in the short term, even under the most auspicious scenarios of increased downstream demand for responsible cobalt. This is due not only to the nature of the sector and of its actors, but also to the limited pool of local skilled talent required to scale up the implementation of the evaluated systems.

⁽²⁰⁴⁾ For a description of how this process unfolded in the Katangese tin, tantalum and tungsten sector, see Diemel (2018).

6. Conclusions

Given the strategic role of batteries for the fulfilment of the EU policy objectives, ensuring that materials used in batteries are produced and sourced in a responsible and sustainable way is paramount. This report has analysed this topic from different angles, focusing first on the potential social risks, using secondary data at country level (Chapter 2) and corporate level (Chapter 3), and then exploring initiatives developed to respond to such criticalities. This was done by reviewing the existing initiatives promoted at the various steps of the supply chain (Chapter 4) and then assessing two of them using primary data collected at mining sites (Chapter 5).

The **hotspot analysis** showed which materials and countries represent the highest risk and could be potential issues of concern in the future for the sustainable and responsible supply of materials for batteries. Media, international organisations, NGOs, etc. have associated cobalt with serious human rights abuses, corruption and the use of armed forces in the extraction sites. The analysis confirmed that this material has, by far, the highest risk among those researched when taking into account global indices on governance, conflicts, social risks, environmental performance and water risk. However, other criticalities emerged from the analysis and might come to public attention in the future, for instance nickel from the Philippines and natural graphite from Mozambique. Future problems could also arise from the extraction of graphite from Tanzania, lithium from Bolivia and nickel from Indonesia. Supply from emerging countries such as Brazil, China, Russia and South Africa could be a problem from a responsible sourcing perspective. The main areas of potential impacts are biodiversity and indigenous community rights in Brazil, water risk and environmental performance in South Africa, and decent working conditions in China. In Russia, the main concern relates to conflicts and governance indicators (probably related to the war in Crimea but not necessarily linked to the mining sector, which is, however, very poorly scrutinised by NGOs, international organisations, etc.). India might also present risks, even though this country is not very relevant to the supply of battery materials to the EU. Other non-EU countries, which did not emerge as hotspots, have medium to high risk levels in some categories only, for instance water risk in Australia, conflict risk in the USA (in two indicators out of three) and governance in Argentina. The screening allowed us to identify areas for further research and in-depth investigation. Given the nature of these data (country-based indicators), the level of accuracy of this analysis is low, and territorial heterogeneity is not captured by this analysis. Another limitation is that only the mining sector is in the scope of this analysis. The other phases of the supply chain (e.g. smelting/refining, manufacturing) should also be scrutinised in order to get the complete picture.

The **analysis of company disclosures** showed the amount and quality of information that comes from sustainability reporting and could be used to perform an S-LCA. The levels of disclosures are very heterogeneous between companies and only in a few cases are commodity-specific information, project-level disclosures and third-party assurance reports available. Most of the time, data are provided at the corporate or country level. The categories of impacts that are reported most often relate to health and safety at work, diversity and gender balance issues, and activities in local communities. Given the importance and spread of sustainability reporting, having more stringent guidance on how to self-report sustainability information and provide meaningful figures would allow a more robust social impact assessment, avoiding the risk of whitewashing.

The **review of initiatives and standards** provides an overview of the heterogeneous landscape of actions undertaken by different stakeholders to address responsible and sustainable sourcing. The analysis shows the different scopes and positioning in the supply chain of the initiatives. The areas of risk that are taken into account are also different. Most of the responsible sourcing initiatives are based on the OECD risk categories, and add other aspects to be taken into account (for instance, health and safety at work and impacts on local communities are often included). Some initiatives also include environmental aspects such as biodiversity impact, or use of resources, showing that responsible sourcing can be a flexible concept going far beyond the risks mentioned in the OECD Guidance. All the initiatives include child labour as a risk category to be scrutinised in a due diligence process. However, some initiatives refer to the 'worst forms of child labour' (as recommended by the OECD) while others refer to any form of child labour. Attitudes towards ASM can also be different. Two initiatives exclude ASM from their supply chain, as it is considered to be too risky, and aim to supply only from LSM.

The systems analysed as part of the **case study** (Kasulo and Mutoshi mining sites) have shown that they are effective at implementing the changes that they are designed to implement. This is especially obvious when it comes to life-threatening health and safety issues and child labour. While the results of the analysis are overall very encouraging, it is necessary to highlight that these systems have brought forward positive change only within their scope. This means that their impact is limited to the sites where they have been

implemented and do not necessarily spill over to the titles these sites are part of. Furthermore, their impacts are limited to the risk categories they are designed to work with, risk categories that are dictated by downstream expectations and do not necessarily correspond to the demands of the miners they are designed to protect. Issues of price calculation are particularly salient and are not captured by evaluations that rigidly follow downstream responsible sourcing demands. The S-LCA methodology offers a promising avenue to expand the scope of enquiry in a structured manner.

Another key point is that these systems in their current form do not guarantee traceability, and do not seek to do so. Therefore claims can only be made regarding the characteristics of the material produced by the pilots and not of the overall supply of the operators. And while the OECD guidance does not prescribe traceability as a strict requisite to attaining sufficient upstream supply chain transparency but also accepts other systems (such as chain of custody systems or mass balance approaches, depending on the risk profile of the supply chain), the reporting and communication of operators should fully disclose the nature and limitations of their chosen approach to supply chain transparency.

In line with this finding, local civil society organizations representatives have repeatedly voiced the worry that companies' participation in the pilots could be used to whitewash their reputation as a whole in a way that does not reflect the contribution of the pilot sites to the companies overall supply, thus sweeping under the carpet the issues found in the rest of the companies' operations.

Finally, the scalability of these pilots within a short time frame, in order to respond to any increase in the demand for responsibly sourced cobalt (triggered by future legislation, for example), is an unknown factor. At present it appears that the lack of availability of skilled and dedicated local professionals with integrity might become a bottleneck to the further deployment of responsible sourcing systems and/or initiatives. Other factors that, plausibly, could be considered as bottlenecks and should be better investigated regard the cost/competitiveness disadvantages with informal ASM; the lack of land made available to ASM; the lack of LSM or other operators with similar engineering expertise willing to engage in formalization projects.

Despite the challenges noted above, the analysed systems represent a very promising avenue to reconcile the rising global need for cobalt with the development, formalisation and professionalisation of a sector that provides unmatched livelihood opportunities to hundreds of thousands of the DRC's most vulnerable citizens, who would be affected significantly by any ASM ban that would have an impact on the price they could ask for their production and thus their day-to-day lives and those of the families that depend on them. Given the positive results of the initiatives and the vulnerability of commercial systems to commodity price cycles, further support through, e.g., public funding, would facilitate the development of similar initiatives.

6.1. Outlook and next steps

This study is a first step towards the understanding and quantification of the main risks in battery supply chains, and the assessment of the impact of current initiatives aimed at improving the situation of the artisanal mining sector in the DRC. In the DRC mining sector, severe impacts have been reported by several studies in the past, but how responsible sourcing initiatives are working on the ground, and their effectiveness in achieving improvements of social conditions, have not been addressed so far, to our knowledge. This study is intended to fill this research gap, investigating the initiatives that are at a sufficient stage of implementation. As more initiatives are going to be deployed, the investigation could be replicated to increase knowledge of this issue and build recommendations for improving the effectiveness of these initiatives and strengthening the due diligence efforts of downstream companies.

From the hotspot analysis performed in this study, other criticalities emerged in terms of potential social risks. Therefore, these results indicate areas where further primary data collection and impact assessment could be addressed. In particular, countries supplying many materials to the EU (Brazil, China, Russia and South Africa) are poorly investigated in terms of social conditions in the mining sector. The analysis performed here, moreover, could be extended to further steps of the supply chain.

The review of responsible sourcing initiatives performed in this study, and focused on cobalt, could be deepened in order to systematically analyse the risk and impact categories taken into account in each scheme and compare the different coverages. This would allow the identification of a set of risks/impacts to be assessed in order to ensure the ethical sourcing of materials for batteries. Such analysis would be very useful for future policy purposes, for example to support the preparation of potential due diligence requirements in the forthcoming regulation on sustainability requirements for batteries. Moreover, it would help in establishing a common definition of responsible sourcing, defining its distinctive characteristics and differences from the concept of sustainable supply.

The hotspot analysis and the screening of sustainability reports proposed in this report could be applied to other strategic sectors and applications that contain critical raw materials (renewable energies, digital application, etc.) in order to identify potential social risks in other supply chains. Moreover, this analysis could be replicated and extended to novel materials used in innovative battery technologies, in order to provide foresight of potential social risks linked to future battery technologies.

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Abbreviations

2C	cobalt and copper
3TG	tin, tungsten, tantalum and gold
ANR	Agence nationale de renseignement
ASM	artisanal and small-scale mining
BGI	Better Gold Initiative
BRICS	Brazil, Russia, India, China, South Africa
CAHRAs	conflict-affected and high-risk areas
CAP	corrective action plan
CCCMC	China Chamber of Commerce of Metals, Minerals & Chemicals Importers and Exporters
CCCMC Guidance	CCCMC due diligence guidelines for responsible mineral supply chains
CDM	Congo Dongfang International Mining
CIRAF	Cobalt Industry Responsible Assessment Framework
Comiakol	Coopérative Minière Artisanale de Kolwezi
Comiku	Coopérative Minière Kupanga
CSO	civil society organisation
Demiap	Direction Militaire des Activités Anti-Patrie
DRC	Democratic Republic of the Congo
EITI	Extractive Industry Transparency Initiative
EJ Atlas	Environmental Justice Atlas
EPI	Environmental Performance Index
ERG	Eurasian Resources Group
FARDC	DRC Army (Forces Armées de la RDC)
Gécamines	Générale des Carrières et des Mines
GPI	Global Peace Index
GR	Republican Guard (<i>Garde Républicaine</i>)
GRI	Global Reporting Initiative
ICoC	International Code of Conduct for Security Providers
IFC	International Finance Corporation
ILO	International Labour Organization
Inform	Index for Risk Management
KPCS	Kimberley Process Certification Scheme
LSM	large-scale mining
LTIFR	lost-time injury frequency rate
MCP	Mutoshi Cobalt Pilot
NGO	non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
OECD Guidance	OECD due diligence guidance for responsible supply chains of minerals from conflict-affected and high-risk areas

OHS	occupational health and safety
PEP	politically exposed person
PMH	<i>Police des Mines et Hydrocarbures</i>
PPE	personal protective equipment
PS	Performance Standards on Environmental and Social Sustainability
PSILCA	Product Social Impact Life Cycle Assessment
RGI	Resource Governance Index
RMI	Responsible Minerals Initiative
S-LCA	social life-cycle assessment
Saemape	Service d'Appui à l'Exploitation Minière Artisanale et à Petite Échelle
SDG	Sustainable Development Goal
SOE	state-owned enterprise
SOMO	Centre for Research on Multinational Corporations
TRIFR	total recordable injury frequency rate
VPs	Voluntary Principles on Security and Human Rights
WGI	Worldwide Governance Indicator
WHS	World Heritage Site
WRI	Water Risk Index
ZEA	ASM mining title (zone d'exploitation artisanale)

Figures

Figure 1 Structure of the report, including objectives, scope and nature of data used in the various chapters 11

Figure 2 Main players in the production of materials for batteries 15

Figure 3 Risk components of the composite indicator Inform 18

Figure 4 Influence of each variable in each concept on the overall score 19

Figure 5 Hotspots in the production of battery materials, considering mining stage 29

Figure 6 Steps in the Umicore due diligence process 43

Figure 7 Positions of the actors implementing responsible sourcing initiatives in the material value chain 47

Figure 8 Extract from DRC cadastre focusing on Haut-Katanga and Lualaba 50

Figure 9 2C ASM supply chain..... 57

Figure 10 Cobalt price comparison..... 71

Tables

Table 1 Data on raw materials supply and related data sources	14
Table 2 Risk levels for Worldwide Governance Indicators	16
Table 3 Risk levels for Resource Governance Index.....	17
Table 4 Risk levels for the Inform component human hazard.....	19
Table 5 Risk levels for the Fragile State Index.....	19
Table 6 Risk levels for the Global Peace Index	20
Table 7 Risk levels assigned to forced labour indicators.....	21
Table 8 Risk levels applied to the EPI and WRI	22
Table 9 Main categories included in the EJ Atlas database form.....	23
Table 13 Social LCA framework of impact subcategories and related stakeholder categories	41
Table 14 Risk categories and priority areas suggested in the CIRAF framework.....	42
Table 15 List of criteria for the Umicore supplier assessment.....	44
Table 16 List of risks included in the RMI standard.....	45
Table 17 Characteristics of initiatives on the ground.....	46
Table 18 Colour coding used in the assessment	64
Table 19 Results of pilots' assessment since implementation of the RS system. Summary table	65
Table 20 Metadata related to material supply figures.....	88
Table 21 Risk assessment scheme used for the child labour category	88
Table 22 Risk assessment scheme for the fair salary category.....	89
Table 23 Data reported by Glencore in the sustainability report 2018 related to copper production (selection)	90
Table 24 Glencore's scorecard with the key value flows that assets create for four principal stakeholder groups.....	91
Table 25 Glencore payments to governments (top five), excluding value added tax	92
Table 26 SQM targets on occupational safety	95
Table 27 Albemarle occupational health and safety indicators.....	96
Table 28 Albemarle data on training.....	96
Table 31 Orocobre payments to Argentinian government and other public authorities	98
Table 32 South32 disclosures on representation of women and black people (%)	99
Table 33 Vale's targets on social aspects	100
Table 34 Vale's data on fatalities (GRI 403-2)	100
Table 35 Employees trained in anti-corruption policies and procedures (GRI 205-2).....	100
Table 36 BHP indicators in the pillars People and Society	102
Table 37 Information matrix based on responsible sourcing standards	111
Table 38 Information matrix based on S-LCA aspects not included in the table above (referring to stakeholder categories: local communities and workers).....	117

7. Annexes

7.1. Annex 1. Methodological notes on the hotspot analysis

Data sources and assumptions for the calculation of EU sourcing

In order to calculate the indicator 'EU sourcing' used in the hotspot analyses, material production of EU Member States and imports are taken into account. Trade statistics (usually Eurostat Comext and UN Comtrade) track the import and export of various materials and semi-finished products, which contain various amounts of materials. In Table 20 we report the data sources used to calculate EU sourcing, the related trade code and any assumptions made on the material content contained in the traded goods.

Table 20 Metadata related to material supply figures

Material	Sources	Trade codes and assumptions
Cobalt	Eurostat Comext database; Roskill Information Services, Cobalt: Market Outlook to 2018, 12th Edition; experts opinion	CN 2605 000 assuming 10 % cobalt content; CN 81052000 assuming 20 % cobalt if value EUR 10/t; 60 % cobalt if EUR 10–20/t
Lithium	World Mining Data (2012–2016)	CN 253090 assuming 46.5 % lithium content
Manganese	Commodity Trade Statistics Database; Ullmann's Encyclopedia of Industrial Chemistry (2012), Manganese and manganese alloys	2602 0000 manganese ores and concentrates, including ferruginous manganese ores and concentrates with a manganese content of 20 % calculated on the dry weight
Natural graphite	World Mining Data (2012–2016); Comext database	25041000 natural graphite in powder or in flakes; 25049000 natural graphite (excluding in powder or in flakes) assuming 95 % of carbon
Nickel	UN Commodity Trade Statistics Database	HS2604 nickel ores and concentrates, assuming 20 % nickel content

Child labour and fair salary risk assessment

Risk levels for two indicators used in the hotspot analysis, child labour and fair salary, have been retrieved from PSILCA. PSILCA is a repository of data for S-LCA developed by GreenDelta GmbH. It provides information on social aspects of products over their life cycles⁽²⁰⁵⁾. The risk levels for the categories child labour and fair salary have been retrieved from this database, adapting the PSILCA risk levels (five levels, from no risk to very high risk) into the four-level framework used in this hotspot analysis.

In the case of child labour, the data source is the World Bank, which provides data on children in employment, considering the ages 7–14. PSILCA provides six risk levels (from no risk to very high), which have been converted into the four-level scheme used in this analysis, as shown in Table 21.

Table 21 Risk assessment scheme used for the child labour category

Indicator	Unit	Indicator value (y: % of children in employment)	PSILCA risk level	Risk assessment used in this report
Children in employment	% of all children aged 7–14	0	No risk	Low risk
		$0 < y < 2.5$	Very low risk	
		$2.5 \leq y < 5$	Low risk	
		$5 \leq y < 10$	Medium risk	Medium risk
		$10 \leq y < 20$	High risk	High risk
		$20 \leq y$	Very high risk	Very high risk
		—	No data	—

⁽²⁰⁵⁾ Eisfeldt (2017).

In PSICLA, 'fair salary' is not a single indicator but is based on the combination of three indicators:

1. *living wage, per month,*
2. *minimum wage, per month,*
3. *sector average wage, per month.*

The data sources for these indicators are WageIndicator (for the living and minimum wages) and ILOStat for the sector average wage. The risk level used for the category fair salary corresponds to the average of risk levels assigned to each indicator, according to the risk assessment scheme shown in Table 20.

Table 22 Risk assessment scheme for the fair salary category

Indicator	Unit	Indicator value (y: living wage)	PSILCA risk level	Risk assessment used in this report
Living wage, per month	USD	$y < 100$	Very low risk	Low risk
		$100 \leq y < 200$	Low risk	
		$200 \leq y < 500$	Medium risk	Medium risk
		$500 \leq y < 1\ 000$	High risk	High risk
		$1\ 000 \leq y$	Very high risk	Very high risk
Minimum wage, per month (x = living wage/minimum wage)	USD	$y > 300$ AND $x < 0.5$	Very low risk	Low risk
		$y > 300$ AND $0.5 \leq x < 0.9$	Low risk	
		($y \leq 300$ AND $0.5 \leq x \leq 0.9$) OR ($y > 300$ AND $0.9 \leq x < 0.3$)	Medium risk	Medium risk
		($y \leq 300$ AND $0.9 \leq x \leq 1.3$) OR ($y > 300$ AND $1.3 \leq x < 1.8$)	High risk	High risk
		($y \leq 300$ AND $1.3 \leq x \leq 1.8$) OR ($x \geq 1.8$)	Very high risk	Very high risk
Sector average wage, per month	USD	$2.5 \leq y$	Very low risk	Low risk
		$2 \leq y < 2.5$	Low risk	
		$1.5 \leq y < 2$	Medium risk	Medium risk
		$1 \leq y < 1.5$	High risk	High risk
		$0 < y < 1$	Very high risk	Very high risk

7.2. Annex 2. Company-based data used in Chapter 3

This annex presents the detailed information found in sustainability reports published by mining companies producing materials for batteries. The focus is on data related to social aspects.

Cobalt

Glencore

The main producer of cobalt is Glencore, one of the world's largest natural resource companies, which operates in the DRC. It is the world's largest cobalt-mining company, achieving total production of 27 400 tonnes in 2017 ⁽²⁰⁶⁾.

Glencore produces cobalt mainly as a by-product of copper mining in the DRC, but also as a by-product of nickel mining in Australia and Canada. It is also one of the largest recyclers and processors of cobalt-bearing materials, such as used batteries.

The company directly employs 83 679 people around the world, with a total of 158 000 including contractors.

The company publishes yearly sustainability reports. These reports present quantitative data on the main strategic priorities for the year of publication and 4 years before, in order to show the trend. Other data are available only for the year of publication and 1 or 2 years before. Table 23 shows the key performance indicators used by the company to monitor sustainability in the copper production sites, which also produce cobalt as a by-product. They include 19 sites around the world, including the Katanga site in the DRC. The same indicators are also measured for the other commodities produced by Glencore (e.g. coal, ferroalloys, nickel, zinc and oil) and at corporate level.

Table 23 Data reported by Glencore in the sustainability report 2018 related to copper production (selection)

Indicator	2018	2017	2016
Fatalities at managed operations	4	1	13
Lost time injury frequency rate (per million hours worked)	0.38	0.38	0.71
Total recordable injury frequency rate (per million hours worked)	2.87	2.34	2.89
New occupational disease cases	7	20	53
Water withdrawn (million m ³)	349	372	350
Total energy use (petajoules)	43	43	42
Community investment spend (million USD)	38.8	37.5	32.2
Number of employees and contractors	50 256	55 760	44 473
Percentage of female employees	8	8	8

The data reported above, while allowing for a temporal comparison and tracking of progresses, have some shortcomings in terms of understanding and assessment of impacts, for instance the following.

1. The severity of injuries and occupational diseases is not specified.
2. Data on water usage are not put into the context of data on local water stress, so they are barely usable to assess impacts.
3. The sources of energy used (e.g. proportion renewable) are not specified.
4. The investment in local communities is not further specified. Even though the report describes some financed activities for local communities in various countries where it operates, the proportion of investment for each activity is not disclosed.

⁽²⁰⁶⁾ Glencore (2019).

Additional insights are provided by Glencore through the 'scorecard', which examines key value flows that assets create for four principal stakeholder groups: employees, suppliers, communities and government (see Table 24).

Table 24 Glencore's scorecard with the key value flows that assets create for four principal stakeholder groups

Stakeholder group	Value flows	2018 results
Employees	Wages and benefits	96 % of workforce is local to the country where we operate
Suppliers and contractors	Procuring goods and services Skills and enterprise development	74 % of global procurement spend is with suppliers and contractors local to the countries where we operate More than 85 000 people benefited from enterprise development and economic diversification investments
Local communities	Community development Use of shared public use infrastructure Skills and enterprise development	USD 95 million spent on programmes supporting local community development, including about USD 17 million on enterprise development and economic diversification of local entrepreneurs Around 2.4 million people living near to assets have benefited from the community investment activities, including environmental initiatives, healthcare facilities, education programmes and enterprise development USD 5.3 million spent on infrastructure for water processing and distribution USD 3.9 million spent building or maintaining over 134 kilometres of roads
Local and national government	Taxes and royalties Shared public-use infrastructure	USD 5.7 billion paid to host governments in taxes and royalties In total nearly USD 20 million spent on public infrastructure such as water, sewage and power networks and roads USD 5.3 million spent on infrastructure for water processing and distribution USD 3.9 million spent building or maintaining over 134 kilometres of roads

Payments to governments

The company also discloses information on the annual payments to governments, including the information required by the EU Non-financial Reporting Directive, and details payments by country, project and recipient (Table 25). The amount paid to the DRC in 2018 was USD 1 063 million. The amount of payments, however, is not set in relation to earnings or other costs.

Table 25 Glencore payments to governments (top five), excluding value added tax

Country	Million USD
Australia	2 193
Democratic Republic of the Congo	1 063
Kazakhstan	438
South Africa	357
Canada	327

Note: Does not include total net refunds from governments on value added tax, goods and sales tax, and sales tax amounting to USD 1 559 million. Taxes and royalty payments for Equatorial Guinea amounting to USD 26 million are now included. Does not include income taxes paid in Colombia, Peru and Chile, relating to Glencore's proportionate ownership interest in joint ventures (Cerrejón, Antamina and Collahuasi), amounting to a total of USD 725 million.

Diversity is also part of the main corporate targets: during 2018, the company developed guiding principles to improve gender balance, encourage and support diversity, and prevent discrimination. Group-wide, 12 961 women, 15 % of the employees (2017: 12 037, 14 %) were employed.

Other data can be collected from the following reports published in 2018:

1. *Modern Slavery Statement 2018* ⁽²⁰⁷⁾,
2. *Databook and GRI References 2018* ⁽²⁰⁸⁾,
3. *'Our Approach to Sustainability'* ⁽²⁰⁹⁾,
4. *2018 Human Rights Report* ⁽²¹⁰⁾.

In its *Modern Slavery Statement 2018* Glencore reports its commitment to prevent modern slavery and human trafficking in its operation and supply chain. Data on the activities in progress in 2018 are listed and described, e.g. supply chain due diligence, human rights training and human rights incidents. The method of reporting them was updated as well as the data.

The supply chain due diligence throughout the entire business is built in accordance with the requirements of Glencore's code of conduct and is aligned with the UN Guiding Principles and OECD Guidance.

Information regarding the DRC

Particular attention is given to ASM, implementing activities to discourage the prevalent ASM of cobalt in the DRC. The company claims to develop due diligence processes to ensure ASM material does not enter in the supply chain.

In the DRC, the company also claims to have provided the local communities with the following activities in 2018:

school holiday camps for over 9 000 children, providing a meal each day and teaching them about children's rights, the importance of education and the risks associated with artisanal mining;

support to over 140 agricultural cooperatives for the development of small sustainable business (such as supplying vegetables to their Katanga mine site canteen and preparing meals for a local mining company);

1. a malaria prevention programme based on indoor residual spraying of local homes, raising awareness of malaria prevention strategies with employees and local communities, maintenance of the drainage systems in local communities and treating mosquito larvae;
2. actions to prevent HIV/AIDS, which include voluntary counselling and testing for both employees and local communities, education on HIV/AIDS (and tuberculosis) prevention and management, building awareness of mother-to-child transmission and an HIV/AIDS workplace awareness programme.

Concerning engagement in responsible sourcing initiatives, Glencore is a core taskforce member for the Cobalt Institute's development of CIRAF for the production of cobalt (see Section 4.2.1).

⁽²⁰⁷⁾ Glencore (2018a).

⁽²⁰⁸⁾ Glencore (2018b).

⁽²⁰⁹⁾ Glencore (2018c).

⁽²¹⁰⁾ Glencore (2018d).

In the sustainability report, the company declares that ‘sanctions imposed on Dan Gertler, Katanga’s deliberations with Gecamines over the required recapitalisation of its main operating subsidiary, the introduction of a new mining code and the appearance of excess levels of uranium in the cobalt hydroxide produced at Katanga.’ (p. 6)

‘sanctions imposed on Dan Gertler, Katanga’s deliberations with Gecamines over the required recapitalisation of its main operating subsidiary, the introduction of a new mining code and the appearance of excess levels of uranium in the cobalt hydroxide produced at Katanga.’

On 22 February 2018, IndustriALL ⁽²¹¹⁾, a global union federation, issued a public statement accusing Glencore of workers’ rights abuses at Mutanda Mining and Kamoto Copper Company, its assets in the DRC. Allegations included assertions that the assets provide insufficient drinking water, low-quality food and limited healthcare for workers and their families, and that wages are low. When IndustriALL visited the DRC in February 2018 to meet with local unions at Glencore mines, the company denied access to its operations, and security forces attempted to break up a union meeting in a church and arrest the organisers.

Natural graphite

For graphite, we have considered the main producing company in each country where this material is produced: China Carbon Graphite Group (China), Graphite India Ltd (India) and South Star Mining Corp (Brazil). The level of awareness of sustainability aspects is lower than among the other material producers. In fact none of these three main producers has published a sustainability report.

Little information on social aspects can be found on Graphite India Ltd’s website ⁽²¹²⁾. It claims that ‘all workmen are provided with nose masks, safety shoes, hand gloves, dress and helmets among other equipment. Regular safety audits are carried out and actions are taken. All the workmen who work at height are provided with belts and they work under supervision of engineer. Signboards indicate the necessity of safety devices and are displayed all over the plant. Fire extinguishers are installed/kept at vulnerable location. Regular training by qualified trainers are organized for fire fighting. The pressure vessel/storage tanks/life tackles are regularly checked for load bearing capacities.’

Quantitative data on targets and social aspects are not published.

Lithium

Argentina, Australia and Chile are the main lithium-producing countries. The South American Lithium Belt, a 500-miles-by-200-miles north–south strip centred on the junction of Argentina, Bolivia and Chile, contains more than 75 % of the world’s lithium reserves.

This section takes into account some examples of companies producing lithium in Argentina, Australia and Chile: Talison Lithium Inc. in Australia, SQM and Albemarle Corporation in Chile, and Orocobre in Argentina.

Australia currently has eight companies listed on the Australian Securities Exchange with lithium deposits and was the world’s leading producing country in 2019, according to World Mining Data.

Talison Lithium Inc

Talison Lithium Inc. is a world-leading lithium mineral producer. Its production from its Australian operation fulfils roughly a third of the world’s lithium demand, and supplies 75 % of Chinese demand. Its Greenbushes lithium operation has been producing lithium for over 25 years. The mine is located 250 km south of Fremantle – a major container shipping port – and 90 km southeast of the Port of Bunbury, a major bulk handling port in Western Australia. The company website ⁽²¹³⁾ includes pages on social sustainability, i.e. on ‘Health and Safety’ and on ‘Community’. These pages describe the company values and some programmes provided to workers (e.g. training, counselling and advice on physical and mental well-being) and to the local community (support to the local school, event organisation, open days, etc.). However, no quantitative data on specific targets or performances are reported.

⁽²¹¹⁾ IndustriALL (2018).

⁽²¹²⁾ <https://www.graphiteindia.com/>

⁽²¹³⁾ <https://www.talisonlithium.com/sustainability-overview>.

SQM

Concerning Chilean companies, SQM ⁽²¹⁴⁾ produces lithium carbonate in the Salar del Carmen plant, close to Antofagasta, Chile, from solutions with high lithium concentrations extracted from the Salar de Atacama. It produces lithium hydroxide from lithium carbonate. The company published a sustainability report in 2019 (reporting for the year 2018 ⁽²¹⁵⁾), in line with the GRI standard. Similar reports have been published since 2011.

Jobs and working conditions

SQM provides an annual average of 11 721 jobs in Chile and around the world, including company personnel and contractors. The company has 5 214 direct workers, 4 937 of them based in Chile, while 277 are located abroad. The monthly average number of contractors was 6 507 in 2018. A total of 4 274 employees (87 %) work in the Tarapacá and Antofagasta regions, while 594 workers (12%) are based in the Metropolitan Region. Senior managers or executives are local employees who live in the regions where the main production centres and offices are located. Thus, 75 % of the executives come from and work in the Tarapacá and Antofagasta regions, while 100 % of the executives at the Santiago office are from the Metropolitan Region.

Concerning the type of contract, the company claims that 96 % of all employees (in Chile and abroad) have open-term contracts and 4 % are employed for a fixed term.

SQM direct workers receive a certain number of benefits. Some of them are mandatory under national law, while others are additional benefits provided by the company, such as the following:

1. national holiday and Christmas bonuses,
2. special bonuses for education, funeral assistance, marriage and births,
3. special leave for bereavement, marriage or moving and to have mammograms or prostate exams,
4. life insurance for each employee, which covers natural or accidental death and disability,
5. supplementary health insurance,
6. catastrophic health insurance,
7. dental insurance,
8. termination benefits in the event of employee resignation, with varying benefits based on position,
9. university scholarships for children of employees who demonstrate academic excellence,
10. university and graduate-level scholarships for outstanding employees.

According to the report, salaries are determined for each position based on several factors such as education, experience and job responsibilities. The salaries are reviewed yearly by considering these factors and comparable industries. No data are reported on salaries and it is not possible to compare them with a local living wage, but it seems that this topic receives much consideration.

The company has 20 unions representing 65 % of all employees, primarily at its main production centres including Antofagasta. Over 66 % employees in Chile are covered by a collective bargaining agreement.

Complaint channel

SQM developed a complaint channel available to all SQM employees around the world. If a worker wants to report an abuse, a corruption case can be reported through a website. The information given through the website is reviewed and handled by an ethics and compliance department before continuing through regular channels and procedures established in the internal investigation procedures.

The report specifies the types of complaint, 23 % being for violation of internal policies, 19 % harassment, 14 % corruption, etc. No complaints about discrimination or human rights abuses have been registered.

⁽²¹⁴⁾ <https://www.sqm.com/en/sustentabilidad/reporte-de-sustentabilidad/>.

⁽²¹⁵⁾ SQM (2019).

Occupational safety

The report describes progress on several social topics, including goals and few numerical targets in the health and safety area (Table 26).

Quantitative information is provided about types of contract (fixed term and open ended) per gender, training given for different employee categories and genders, accident type and lost-time injury frequency rate (LTIFR) for direct employees and contractors.

Table 26 SQM targets on occupational safety

Target 2018	Achievement	Target 2019
Zero accident goal Reference goal of attaining an LTIFR less than or equal to 1.22	Reduced LTIFR by 62%, from 1.28 in 2017 to 0.49 in 2018.	Reference goal: LTIFR less than or equal to 1 Reference goal: accident rate (LTIFR + NLTIR) of 4.24

Gender balance

Women represent 15.8 % of SQM employees in Chile, and initiatives to encourage women in its workforce were undertaken, for instance ‘the participation in a working group in Santiago organized by the ministries of mining and women and gender equity, which culminated with the signing of the “Ten Commandments of the Mining Industry for Incorporating Women and Balancing Work, Family and Personal Life”’ and ‘the organization of campaigns to raise awareness among human resource staff regarding gender equity and workplace and sexual harassment’.

Community relations

The report dedicates a large section to the community relations and engagement, describing initiatives in training, scholarships, sports, etc. For instance, in 2018 a maths assistance programme interested more than 1 700 students. Commitments and achievements in the area of sustainable development are also described, but the amount invested in community relations and local development is not disclosed.

Albemarle Corporation

The Albemarle Corporation is a global specialty chemical supplier (bromine, catalysts, lithium derivatives, etc.), with headquarters in North Carolina (USA), operating in various countries in the world. It is an industry leader in lithium and lithium derivatives, one of the highest growth markets in the specialty chemicals industry.

It has a website dedicated to sustainability aspects and regularly publishes a sustainability report, since 2009 ⁽²¹⁶⁾. Unlike the reports published in 2009–2016, those published in the last 3 years (2017, 2018, 2019) are not compliant with the GRI standard ⁽²¹⁷⁾.

The company has three independent primary lithium resources in operation:

1. Salar de Atacama (Chile), where Albemarle has operated since the 1980s,
2. Silver Peak (Nevada, USA), where the company has operated in an additional brine-based plant since the 1960s,
3. Greenbushes, Western Australia, where lithium is extracted from spodumene resources.

The lithium sales registered in 2018 were USD 1.23 billion, representing 36.4 % of the whole corporate business.

Quantitative data on several topics are reported in the sustainability report, such as the lowest salary paid per location and compared with minimum wage. Only some of them are disaggregated by country and/or

⁽²¹⁶⁾ Available at <https://www.albemarle.com/sustainability/sustainability-reports/resources>.

⁽²¹⁷⁾ <https://database.globalreporting.org/organizations/21527/>.

operation, while others are disaggregated by region (Latin America, Asia, Europe, etc.) or provided at corporation level.

For instance, data on injuries are disclosed at global level (Table 27), while data on training provided to employees are specified at plant level (

Table 28).

Table 27 Albemarle occupational health and safety indicators

Indicator	2018	2017	2016	2015	2014
Injury rate	0.54	0.56	0.53	0.57	0.33
Occupational diseases	0	0	0	0	0
Lost days	524	747	258	551	175
Work-related fatalities	0	0	0	0	0
Contractor rate	0.69	0.50	0.00	0.72	0.54

Table 28 Albemarle data on training

Location	Name	Average hours of training/year/employee
Salar de Atacama (Chile)	El Salar	24.6
Nevada	Silver Peak	20.0

Orocobre

Orocobre is a mineral resource company with its headquarters in Brisbane, Australia. It produces lithium carbonates in the Olaroz Lithium Facility, located in Jujuy Province in northern Argentina.

The company published a sustainability report in 2018, which is available on its website⁽²¹⁸⁾. The report was developed in accordance with the GRI standard. The year 2018 was the second year of full commercial production and the second year of sustainability reporting for the company.

The report presents clear sustainability goals aligned with the UN SDG framework. They are measured with indicators for the years of production 2018 and 2017 (and 2016 in some cases).

Workforce composition and remuneration

Table 29 shows data on the composition of the workforce and its evolution in 2018 from the Orocobre sustainability report. The total number of employees had increased from 251 to 309, and the employees were mainly local (45 %), male (85 %) and in the 30 to 50 age group (62 %).

⁽²¹⁸⁾ Orocobre (2018).

Table 29 Data on workforce composition in Orocobre

Local employment	Share
Local	45 %
Provincial	28 %
National	25 %
International	2 %
Gender diversity	
Male	85 %
Female	15 %
Age diversity	
< 30	31 %
30 - 50	62 %
> 50	7%

Source: Orocobre (2018)

Occupational safety

Orocobre fosters a ‘zero harm’ approach when it comes to the safety of the employees and project contractors. The company claims to be strongly committed to reduce workplace risks and incidents, and consistently review its management and reporting systems. Example of data available are reported in Table 30.

Table 30 Orocobre data disclosures on health and safety

Health and safety indicators	2017	2018
Contractors		
LTIFR	3.5	1.7
TRIFR	3.5	3.5
Employees		
LTIFR	3.9	3.0
TRIFR	3.9	3.3

LTIFR, lost time injury frequency rate; TRIFR, total recordable injury frequency rate.

Moreover, an in-depth safety audit was conducted by DuPont in January 2018, which evaluated safety performance using the DuPont™ Bradley Curve™. This has provided a critical baseline and tool to objectively benchmark the journey to world-class safety performance.

Government payment

Other data disclosed concern the Argentinian government payment in royalties and taxes, as shown in Table 31.

Table 31 Orcobre payments to Argentinian government and other public authorities

Royalty and other government payments	USD (thousands)
Provincial royalty	1 641
Other provincial and municipal taxes	133
Other national taxes	850
Employment taxes paid by SDJ	1 487
Total paid by SDJ	4 111
Provincial withholding tax to local business	583
National withholding tax on salaries	550
National withholding tax to local business	5 265
Total withheld by SDJ	6 399

Local communities

The company claims to have aligned its community investment strategy to the UN SDGs and targets. The report presents some local economic development and capacity-building initiatives, such as the Community Microcredits Program, Education Plan and Artisan Development Project.

Manganese

South Africa is the world's largest producer of manganese and in 2018 its output of the metal remained almost the same as the previous year at 5.5 million tonnes. The country also holds the largest reserves of manganese, at 230 million tonnes.

South32

South32 is a major presence in the South African manganese space. South Africa Manganese, one of the company's four operations in South Africa, is made up of Metalloys and Hotazel Manganese Mines. Notably, the Hotazel mine is located in the manganese-rich Kalahari Basin, which holds 80% of the world's known manganese ore resources. About 3 000 people – both full-time employees as well as contractors – work on its South African manganese projects. The company also has mining and production sites in Australia.

Sustainability aspects are mentioned on the website. For instance, it is explained how the company contributes to the SDGs⁽²¹⁹⁾. The company publishes on the website its sustainability approach concerning community, health, safety and environment, as well as its modern slavery statement for the years 2016 to 2018⁽²²⁰⁾. However, no quantitative targets are mentioned, with the exception of investment in community initiatives such as supporting the recovery from Cyclone Idai in Mozambique and response to floods in Townsville, Australia.

⁽²¹⁹⁾ <https://www.south32.net/who-we-are/sustainability-approach/sustainable-development-goals>.

⁽²²⁰⁾ https://www.south32.net/docs/default-source/sustainability-reporting/fy2019-sustainability-reporting/hsec-management-approaches-2019.pdf?sfvrsn=ae3490f9_2.

No sustainability report is available but the financial report shows some data on social aspects, such as the gender balance (at company level, so for all locations) and the representation of black people in the workforce in South Africa, for the years 2016, 2017 and 2018 (see Table 32).

Table 32 South32 disclosures on representation of women and black people (%)

Representation	2016	2017	2018
Women			
Workforce	16	16	17
Board	13	14	33
Lead team	17	17	29
Senior leadership	n.a.	31	32
Operational leadership	n.a.	18	18
Black people in workforce in South Africa			
Total employees	79	79	81
Management roles	45	42	45

Nickel

The main producer countries of nickel are Canada, Indonesia, the Philippines and Russia.

Nickel Mines Limited

Nickel Mines Limited is an Australian public company focused on becoming a globally significant, low-cost producer of nickel pig iron, a key ingredient in the production of stainless steel. Nickel Mines holds an 80 % economic interest in the Hengjaya Mineralindo Nickel Mine (Hengjaya Mine), a large-tonnage, high-grade saprolite deposit located in the Morowali Regency of Central Sulawesi, Indonesia. On the website, no mention is made of sustainability and no report is available.

Vale

Vale is the largest producer of iron ore and nickel in the world, with USD 5.5 billion of profit. It also produces manganese, ferroalloys, copper and other materials. It is present in 27 countries, on five continents; its headquarters are in Brazil. In 2017, Vale sold 288 200 tonnes of nickel, which represented 9.2 % of its total net revenue, which amounted to USD 34 billion⁽²²¹⁾. The company owns nickel mines in Brazil, Canada, Indonesia and New Caledonia, as well as wholly owned and joint-venture refineries in China, Japan, South Korea, Taiwan and the United Kingdom⁽²²²⁾. Vale has published sustainability reports in accordance with the GRI standard since 2017.

Vale's sustainability report 2018 contains information on all the aspects listed in the GRI standard, referring to the whole company and usually not disaggregated by material, country or plant.

Vale claims to have updated its sustainability goals for the coming years, in line with the SDGs. Concerning the social areas, priority is given to local income generation, basic health and education in Brazil, and targets for 2030 are set as in Table 33. The company claims that in 2018 it contributed USD 576.4 million in social-environmental expenditures and 34 % of this amount was paid on a voluntary basis.

⁽²²¹⁾ http://www.vale.com/PT/aboutvale/relatorio-de-sustentabilidade-2018/Documents/relatorio-sustentabilidade-2018/pdf/Sustainability_Report_Vale_2018.pdf.

⁽²²²⁾ <http://www.vale.com/en/business/mining/nickel/pages/default.aspx>.

Table 33 Vale's targets on social aspects

Aspect	New target (2030 deadline)
Income generation	Double the average income of 12 000 entrepreneurs
Basic health	Benefit 8 400 families with a supply of drinkable water and/or a dry compostable toilet, implying the reduction in incidence of waterborne diseases and infant mortality
Basic education	Enable full literacy for children up to 8 years of age in 23 municipalities

Other data disclosures include, for instance, the number of fatalities in the years 2016, 2017 and 2018 (Table 34), occupational injuries, social expenditure, anti-corruption training provided to employees in various countries (Table 35), impacts on local communities and resettlement.

Table 34 Vale's data on fatalities (GRI 403-2)

Year	Contractors	Employees
2016	3	2
2017	4	1
2018	1	1

Table 35 Employees trained in anti-corruption policies and procedures (GRI 205-2)

Country	Employees trained
Austria	2
Brazil	4 297
Canada	239
China	32
India	4
Indonesia	187
Japan	1
Malawi	33
Malaysia	176
Mozambique	511

New Caledonia	294
Oman	436
Paraguay	15
Singapore	52
Switzerland	65
United Arab Emirates	2
United Kingdom	3
Uruguay	1
Total	6 350

About one third of the 2018 Vale report is dedicated to the failure of Dam I of the Córrego do Feijão Mine (iron ore tailings) in Brumadinho in the state of Minas Gerais, which happened on 25 January 2019, as a result of which at least 248 people died ⁽²²³⁾. This part aims to report the actions and developments related to the failure of the dam as well as to describe the dam management process, incident prevention and emergency response.

PT Vale Indonesia Tbk is a company within the Vale group with a licence from the Government of Indonesia to explore, mine, process and produce nickel. It has published GRI-compliant sustainability reports since 2012 ⁽²²⁴⁾. The total sales volume of matte nickel in 2018 reached 75 631 tonnes. This accounts for around 4 % of total world nickel sales in 2018. Total employees in 2018 were 3 092 (of whom 243 were women). The report also includes quantitative information on social performances, in line with the GRI standard, for instance the number of workplace accidents disaggregated by area of production and gender in the years 2016, 2017 and 2018.

BHP Billiton

BHP Billiton is a global resources company, extracting and processing minerals, oil and gas. Copper and nickel are assets in Minerals Australia and Minerals Americas. Its headquarters are in Melbourne, Australia, and it has locations in 90 countries. Nickel production occurs in Western Australia, through the asset Nickel West.

BHP Billiton has 62 000 employees and its profits are about USD 8.9 billion. The company regularly publishes a sustainability report ⁽²²⁵⁾ in which it states its strategy with goals and targets, which are set in accordance with the SDGs (Table 36).

⁽²²³⁾ BBC News (2019).

⁽²²⁴⁾ Vale (n.d.).

⁽²²⁵⁾ BHP (n.d.).

Table 36 BHP indicators in the pillars People and Society

Indicators	Targets	Results 2018
Work-related fatalities	0	2
TRIFR	Year-on-year improvement of TRIFR per million hours worked	4.4
Occupational exposure reduction	50 % reduction in the number of workers potentially exposed to the most material exposures of silica and coal mine dust as compared to FY2017 baseline by FY2022	31 %
Significant community events (*)	0	0
Community investments	Not less than 1 % of pre-tax profits invested in community programmes that contribute to improved quality of life in host communities and support the achievement of the UN SDGs	USD 77.1 million
Indigenous peoples	By FY2022, implement Indigenous Peoples Strategy through the development of Regional Indigenous Peoples Plans	Regional Indigenous Peoples Plans have been developed across all geographically relevant assets

(*) A significant event, resulting from BHP-operated activities, is one with a severity rating of 4 or above, based on the company's internal severity-rating scale (tiered from 1 to 7 by increasing severity) and aligned to the Our Requirements for Risk Management standard.

The company claims to have a code of conduct setting the standard for integrity and respect, and mechanisms in place for anyone to raise a report if they feel the code has been breached. Employees and contractors can raise reports through line managers or human resources departments. Processes for the community to report potential breaches of the code are available at the asset level. Some 35 % of the reports received relate to harassments and bullying.

The company has an anti-corruption compliance programme, which is designed to meet the requirements of the US Foreign Corrupt Practices Act, the UK Bribery Act, the Australian Criminal Code and applicable laws of all places where it does business. Risk-based anti-corruption training was completed by 7 406 employees in 2018.

The company percentage of women employees grows annually and reached 1.9 % in 2018; the target is 3 %. Another target is related to flexible working (a key lead indicator for improving the representation of women), which reached 46 % (from 41 %).

The company has an employee inclusion group for BHP's lesbian, gay, bisexual, transgender and others (LGBT+) community and its allies, called Jasper.

The supply team leads a programme of work to build inclusion and diversity incentives into contracts in Australia.

About health and safety, the incidence of employee occupational illness is 4.18 per million hours worked (15 % decrease) and the incidence of contractor occupational illness is 1.92 per million hours worked (34 % increase).

In the report, it is stated that the Nickel West asset 'has not been fully integrated into the BHP Operating Model and has been granted exemptions from certain Our Requirements standards, including the requirements to conduct a human rights impact assessment every three years; have a quantified water balance model (unless required by a material risk); identify opportunities to reduce greenhouse gas (GHG) emissions outside of certain approved activities; and develop GHG public reduction targets. Statements in this Sustainability Report concerning these matters do not apply to Nickel West.' ²²⁶

⁽²²⁶⁾ BHP Sustainability Report 2018, p. 6

7.3. Annex 3. Complete lists of risk categories addressed by initiatives and standards discussed in Chapter 4

International Finance Corporation's Performance Standards on Environmental and Social Sustainability ⁽²²⁷⁾

Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts

Policy

Identification of risks and impacts

Management programs

Organizational capacity and competency

Emergency preparedness and response

Stakeholder engagement

Monitoring and review

Performance Standard 2: Labor and Working Conditions

Working conditions and management of worker relationship

Human resources policies and procedures

Working conditions and terms of employment

Workers' organizations

Non-discrimination and equal opportunity

Retrenchment

Grievance mechanism

Protecting the work force

Child labor

Forced labor

Occupational health and safety

Workers engaged by third parties

Supply chain

Performance Standard 3: Resource Efficiency and Pollution Prevention

Resource efficiency

Greenhouse gases

Water consumption

Pollution prevention

Wastes

Hazardous materials management

Pesticide use and management

Performance Standard 4: Community Health, Safety, and Security

Community health and safety

Infrastructure and equipment design and safety

Hazardous materials management and safety

Ecosystem services

Community exposure to disease

Emergency preparedness and response

Security personnel

Performance Standard 5: Land Acquisition and Involuntary Resettlement

General

Project design

Compensation and benefits for displaced persons

Community engagement

Grievance mechanism

Resettlement and livelihood restoration planning and implementation

Displacement

Physical displacement

⁽²²⁷⁾ International Finance Corporation (2012).

Economic displacement

Private sector responsibilities under government-managed resettlement

Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

General

Protection and conservation of biodiversity

Modified habitat

Natural habitat

Critical habitat

Legally protected and internationally recognized areas

Invasive alien species

Management of ecosystem services

Sustainable management of living natural resources

Supply chain

Performance Standard 7: Indigenous Peoples

General

Avoidance of adverse impacts

Participation and consent

Circumstances requiring free, prior, and informed consent

Impacts on lands and natural resources subject to traditional ownership or under customary use

Relocation of indigenous peoples from lands and natural resources subject to traditional ownership or under customary use

Critical cultural heritage

Mitigation and development benefits

Private sector responsibilities where government is responsible for managing indigenous peoples issues

Performance Standard 8: Cultural Heritage

Protection of cultural heritage in project design and execution

Chance find procedures

Consultation

Community access

Removal of replicable cultural heritage

Removal of non-replicable cultural heritage

Critical cultural heritage

Project's use of cultural heritage

Chinese Due Diligence Guidelines for Responsible Minerals Supply Chains of the China Chamber of Commerce of Metals, Minerals & Chemical Importers and Exporters ⁽²²⁸⁾

Type 1 Risks. Risks of contributing to conflict and serious human rights abuses associated with extracting, trading, processing, and exporting of resources from conflict-affected and high-risk areas:

1. risks of committing, profiting from, assisting with, or facilitating, or sourcing from, or being linked to, any party committing, profiting from, assisting with or facilitating the following serious abuses:
 - (a) any forms of torture, cruel, inhuman and degrading treatment,
 - (b) any forms of forced or compulsory labour, which means work or a service that is exacted from any person under the menace of penalty and for which that person has not offered him- or herself voluntarily,
 - (c) the worst forms of child labour,
 - (d) other gross human rights violations and abuses such as, but not limited to, widespread sexual violence, or failing to ensure non-complicity in human rights violations, including profiting or seem to be profiting or condoning or seeming to condone human rights violations by others,
 - (e) war crimes or other serious violations of international humanitarian law, crimes against humanity or genocide;
2. risks of providing, or sourcing from, or being linked to, any party providing direct or indirect support to non-state armed groups:
 - (a) providing direct or indirect support to non-state armed groups through the extraction, transport, trade, processing or export of mineral resources, which includes, but is not limited to, procuring

⁽²²⁸⁾ CCCMC (date).

- mineral resources from, making payments to or otherwise providing logistical assistance or equipment to non-state armed groups or their affiliates who:
- illegally control resource extraction sites or otherwise control transportation routes, points where mineral resources are traded and upstream actors in the supply chain,
 - illegally tax or extort money or mineral resources at points of access to resource extraction sites, along transportation routes or at points where mineral resources are traded,
 - illegally tax or extort intermediaries, export companies or international traders;
3. risks relating to public or private security forces:
- (a) risk of providing, sourcing from or being linked to any party providing direct or indirect support to public or private security forces who:
- illegally control mineral extraction sites, transportation routes and/or upstream actors in the supply chain,
 - illegally tax or extort money or minerals at point of access to mineral extraction sites, along transportation routes or at points where mineral resources are traded,
 - illegally tax or extort intermediaries, export companies or international traders, disrespect the rule of law and human rights, or neglect the security of workers, equipment and facilities, and the mineral extraction on site or on transportation routes from interference with legitimate extraction and trade,
 - fail to ensure that security forces are engaged in accordance with internationally recognised standards or guidance documents with regard to private security forces, particularly the adoption of screening policies to ensure that individuals or units of security forces known to have been responsible for gross human rights abuses are not hired;
- (b) risks of contributing to, or sourcing from, or being linked to, any party contributing to serious misconduct:
- directly or indirectly offering, giving, promising or demanding any bribes or any other undue advantages, and/or soliciting bribes to conceal or disguise the origin of mineral resources, to misrepresent taxes, fees and royalties paid to governments for the purposes of resource extraction, trade, processing, transport and export, or failing to follow relevant international standards and conventions for anti-corruption,
 - engaging in money-laundering resulting from, or connected to, the extraction, trade, processing, transport or export of mineral resources derived from the illegal taxation or extortion of mineral resources at points of access to mineral extraction sites, along transportation routes or at points where mineral resources are traded by upstream suppliers,
 - avoiding or misrepresenting taxes, fees and royalties or other payments to governments related to mineral resource extraction, trade and export from conflict-affected and high-risk areas, and failing to disclose such payments in accordance with the principles set forth under the Extractive Industry Transparency Initiative or related transparency initiatives.

Type 2 risks. Risks associated with serious misconduct in environmental, social and ethical issues:

1. Risks of contributing to, or sourcing from, or being linked to, any party contributing to serious misconduct.
2. Breaking Chinese or host country laws and regulations or industry minimum standards:
 - (a) Employing children under the minimum working age as legally prescribed by the host country laws and regulations, or, if there is no relevant host country law or regulation, employing children below the minimum working age of 16 years.
 - (b) Disrespecting the rights and interests of young workers (any workers over the legally prescribed minimum working age and under the age of 18).
 - (c) Extracting or sourcing resources from land where the free, prior and informed consent of local communities and indigenous peoples has not been obtained, including those for which the extractor holds a legal title, lease, concession or licence.
 - (d) *Extracting or sourcing resources from mining operations where the culture and heritage of local communities and indigenous peoples have not been respected and protected, or where traditional cultures of local peoples have been harmed.*
 - (e) Extracting or sourcing resources where a legal title, lease, concession or licence has been illegally obtained or violates national laws, or where there are pre-existing legitimate claims to the land by local populations, including those that are under customary, traditional or collective land tenure systems, or where the population residing in the extraction area has been involuntarily resettled.
 - (f) Adverse impacts and gross violation of international and national laws and regulations regarding ambient soil, air and water conditions, including manufacturing, trading and using chemicals and hazardous substances subject to international bans due to their high toxicity to living organisms,

environmental persistence or potential for irreversible ecological impacts, and/or releasing arsenic and mercury emissions.

- (g) Failing to avoid, minimise or, if residual impacts remain, offset the environmental impact and ecological footprint throughout the mining life cycle by conducting thorough environmental impact assessments, minimising waste and emissions, ensuring mine closure and site rehabilitation, conserving resources and recycling, implementing environmental risk management, contributing to the conservation of biodiversity and seeking continual improvement of their environmental performance. Offsetting shall always be the last resort and applied only if all efforts for avoiding or minimising adverse impacts have been exhausted.
- (h) Extracting or sourcing resources from World Heritage Sites (WHSs) or legally protected areas, mining within the buffer zones of WHSs or legally protected areas, or transporting mined resources through WHSs or legally protected areas, thereby providing a threat to the outstanding universal value for which these properties are protected.
- (i) *Failing to report, in a regular and timely manner to stakeholders, on their material impacts and disclose their ethical, social, and environmental performance to their stakeholders in ways that are appropriate and meaningful to their needs. This includes a comprehensive view of their policies, risks and results with regard to ethical, environmental and social matters. It also includes proactively soliciting, respecting and responding to stakeholder feedback and expectations including those from NGOs and local communities.*
- (j) Failing to take proactive steps to respect all other principles set forth in the Chinese Responsible Mining Guidelines that are not included under Type 1 risks or those risks listed above.

7.4. Annex 4. Detailed methodology of the case study presented in Chapter 5

Because of the nature of fieldwork in mixed artisanal and large-scale mining cobalt supply chains in the southern DRC (provinces of Haut Katanga and Lualaba), the field data collection was based on a combination of direct observation, document consultation and stakeholder interviews. However, as a significant part of the supply chain remains non-formal (illegal, informal, outside applicable legal norms or with regulations applied selectively as a norm), stakeholders respond poorly to structured questionnaires, which are too thorough and too often make stakeholders confront their non-formality, thus putting them in a situation of unease vis-à-vis the interviewer, a situation not conducive to establishing the trust and rapport necessary to obtain information on non-formal activities.

To overcome these shortcomings it was instead necessary to make use of open-ended interviews with a number of individuals representing the same categories of stakeholders. These open-ended interviews are in most cases only partial – i.e. they do not cover the entirety of the information to be collected – in order not to be too intrusive into individual's non-formal business. Nevertheless, partially overlapping interviews with multiple individuals representing the same category of stakeholders allow one to gather the required information and, at the same time, triangulate the information coming from various sources.

As there is no standard questionnaire it was necessary to devise an information matrix that highlights all the information to be collected at the different points in the supply chain. Once information had been gathered on all the items listed on the information matrix, using the aforementioned data collection methods, it was possible to fully characterise the situation on the ground.

The data to be collected on the field serve two purposes and are therefore based on two different information matrices:

1. an information matrix dedicated to the collection of the information required for the characterisation of the impacts of the implementation of responsible cobalt-sourcing initiatives in the DRC (Table 37),
2. an information matrix dedicated to the collection of the information required for an S-LCA (Table 38).

In order to enable comparisons and analysis, the characterisation was conducted at a Better Mining site and at a Mutoshi site, where responsible sourcing initiatives have been implemented, in addition to a baseline site representing the cobalt ASM sector in the DRC.

The resulting matrices are complementary and make it possible to gather all the information required by the relevant components of the project. The first matrix is aligned with globally accepted best practice in the form of standards (see next section), which are complementary in their focus, work well with the type of information demanded by S-LCA and are aligned with (but expand upon) the methodological categories used in the hotspot analysis.

Underlying standards and guidance

While a number of initiatives on responsible mineral production and sourcing exist, they are all based on a limited number of underlying guidance/standards that they seek to implement either in full or partially. These are the OECD Guidance and the IFC PS, described in Chapter 4.

As these standards are widely seen as benchmarks within the industry and among stakeholders connected to it, they frame the current responsible sourcing efforts globally and are thus used as the reference standards to develop the questionnaire.

Contextual information

In addition to the indicators necessary to characterise the impacts, both positive and negative, of operations, it is also necessary to collect descriptive information on the working of operations in order to provide the context needed to make more sense of the collected impact information, especially if such information is to be quantified from qualitative indicators. In this case, the contextual information is necessary not only to assign thresholds and benchmarks but also to explain and justify them during any review process.

This information is primarily concerned with operational and supply chain operation details around the mine sites, processing centres and transport, such as mining title ownership, steps in the process, gender breakdown of activities, level of mechanisation and early supply-chain organisation.

Selection of information to collect and indicators

The design of the information matrix followed a structured approach designed to incorporate feedback from subject area experts. It was composed of the following steps:

1. **Comparison of standards' demands.** All risks under the OECD Guidance and CCCMC Guidance and the objectives of the IFC PSs were extracted and compared. Any interconnection, complementarity or overlap was noted.
2. **Consolidation of standards' demands.** Based on the previous comparison, the different elements were consolidated in order to avoid any unnecessary overlap. Consideration was then given to the ASM context and the applicability of each element, particularly in the case of the IFC PSs; the demands of the standard targeting LSM are in certain cases not applicable to the capacity of ASM operations. The decision to include or exclude an element was justified.
3. **Development of first information matrix.** Based on the consolidated list, an initial list of information to collect was designed. This list includes preliminary indications of the information to collect.
4. **Feedback collection and integration.** Based on the feedback received from S-LCA experts, the list of information to collect was updated, and the type of information to collect for each element was added.

In order to keep the questionnaires separate yet ensure as much synergy as possible, S-LCA elements were integrated only when fully in line with the information list submitted for initial feedback collection (and thus based upon the OECD and CCCMC Guidance, and the IFC PSs); other elements were kept separate in a list of information to collect pertaining exclusively to the S-LCA data collection. For elements that would figure in both questionnaires, the *Indicators/Instructions* column was aligned whenever possible to match the indicators of the original S-LCA questionnaires received.

Complementing these information lists, a list of contextual information to collect was designed.

Information matrix finalisation

The finalised information matrix was then used to structure the field data collection and restitution. The information matrix was then used to characterise a Better Mining site and the Mutoshi site; a baseline site representing the cobalt ASM sector in the DRC was also developed in order to enable comparisons and analysis.

Tables 34 and 35 show the information matrix deriving from the responsible sourcing standards and from the remaining S-LCA aspects used to characterise the three mining sites.

Table 37 Information matrix based on responsible sourcing standards

STANDARD	Risk	Information to collect
OECD Guidance		
	Any forms of torture, cruel, inhuman and degrading treatment	<p>Have any of the consulted stakeholders mentioned any forms of torture, cruel, inhuman and degrading treatment (this includes arbitrary detention, arbitrary confiscation of assets, beatings and whippings)?</p> <p>Locate the origin of the Twitter video; is this related to any of the sites?</p>
Regarding serious abuses associated with the extraction, transport or trade of minerals	Any forms of forced or compulsory labour, which means work or service that is exacted from any person under the menace of penalty and for which said person has not offered him- or herself voluntarily	<p>Have any of the consulted stakeholders mentioned any forms of forced labour?</p> <p>Are there suspicions of debt bondage?</p> <p>Are miners required to purchase the PPE or is it offered free of charge?</p> <p>Are IDs (not copies) kept on site?</p> <p>Are miners effectively stranded away from any populated centre?</p> <p>Are miners obliged to purchase goods from specific places?</p>
	The worst forms of child labour	<p>Have any of the consulted stakeholders mentioned labourers under 18 years of age engaged in activities that are detrimental to their health and well-being?</p> <p>Are individuals visibly underage present on site? If so, what tasks are they carrying out?</p> <p>Are there mechanisms to prevent the presence of children on site (such as ID controls for sites that are managed)? If controls are present, are those systematically enforced? By whom?</p> <p>Are there local schools? Are they truly free?</p>
	Other gross human rights violations and abuses such as widespread sexual violence	Have any of the consulted stakeholders mentioned any form of systematic human rights abuses linked to mining? This includes forced displacement and sexual violence
	War crimes or other serious violations of international humanitarian law, crimes against humanity or genocide	Have any of the consulted stakeholders mentioned any such violations, in particular in relation to the political transition that is taking place and the lack of elections in 2016–2018?

<p>Regarding direct or indirect support to non-state armed groups</p> <p>Any direct or indirect support to non-state armed groups through the extraction, transport, trade, handling or export of minerals. Direct or indirect support to non-state armed groups through the extraction, transport, trade, handling or export of minerals includes, but is not limited to, procuring minerals from, making payments to or otherwise providing logistical assistance or equipment to non-state armed groups or their affiliates who:</p> <ul style="list-style-type: none"> (i) illegally control mine sites or otherwise control transportation routes, points where minerals are traded and upstream actors in the supply chain; (ii) illegally tax or extort money or minerals at points of access to mine sites, along transportation routes or at points where minerals are traded; and/or (iii) illegally tax or extort from intermediaries, export companies or international traders 	<p>Are there any non-state armed group in the area? If so have any of the consulted stakeholders mentioned direct or indirect payments (including In the form of protection payments and purchase of services)?</p>
<p>Regarding public or private security forces</p> <p>We agree to eliminate, in accordance with paragraph 10, direct or indirect support to public or private security forces who illegally control mine sites, transportation routes and upstream actors in the supply chain; illegally tax or extort money or minerals at point of access to mine sites, along transportation routes or at points where minerals are traded; or illegally tax or extort from intermediaries, export companies or international traders</p> <p>We recognise that the role of public or private security forces at the mine sites and/or surrounding areas and/or along transportation routes should be solely to maintain the rule of law, including safeguarding human rights, providing security to mine workers, equipment and facilities, and protecting the mine site or transportation routes from interference with legitimate extraction and trade</p> <p>Where we or any company in our supply chain contract public or private security forces, we commit to or we will require that such security forces will be engaged in accordance with the Voluntary Principles on Security and Human Rights. In particular, we will support efforts, or take steps, to adopt screening policies to ensure that individuals or units of security forces that are known to</p>	<p>Have any of the consulted stakeholders mentioned the direct control of mine sites, ASM miners' teams, cooperatives, transport companies or checkpoints by members of armed forces or private security groups?</p> <p>Have any of the consulted stakeholders mentioned ANY payments made to armed forces, including to 'perform services'?</p> <p>Are ANY other armed forces than the PMH present on site? If so, is their presence backed by a contract?</p> <p>Which armed forces are present at checkpoints or in markets? What is their role there?</p> <p>Are private security staff present on site? If so, are they armed? Do they have a contract?</p> <p>Are private security staff trained in the VPs or the ICoC and has due diligence been conducted during recruitment?</p>

	<p>have been responsible for gross human rights abuses will not be hired</p>	
	<p>We will support efforts, or take steps, to engage with central or local authorities, international organisations and civil society organisations to contribute to workable solutions on how transparency, proportionality and accountability in payments made to public security forces for the provision of security could be improved</p>	<p>If any payments are made to armed forces, what is the framework?</p>
	<p>We will support efforts, or take steps, to engage with local authorities, international organisations and civil society organisations to avoid or minimise the exposure of vulnerable groups, in particular artisanal miners where minerals in the supply chain are extracted through artisanal or small-scale mining, to adverse impacts associated with the presence of security forces, public or private, on mine sites</p>	<p>Have the security forces received training on how to interact with at-risk constituents? Are grievance mechanisms available to stakeholders? Is a logbook of incidents available somewhere?</p>
<p>Regarding bribery and fraudulent misrepresentation of the origin of minerals</p>	<p>We will not offer, promise, give or demand any bribes, and will resist the solicitation of bribes to conceal or disguise the origin of minerals, to misrepresent taxes, fees and royalties paid to governments for the purposes of mineral extraction, trade, handling, transport and export</p>	<p>Have any of the consulted stakeholders mentioned the use of bribes during extraction, transport and trading of ores? If so, to whom and for what reason? Have any of the consulted stakeholders mentioned that minerals are mislabelled on purpose? Are there systems in place that could ensure that the origins of minerals are recorded truthfully?</p>
<p>Regarding money laundering</p>	<p>We will support efforts, or take steps, to contribute to the effective elimination of money laundering where we identify a reasonable risk of money laundering resulting from, or connected to, the extraction, trade, handling, transport or export of minerals derived from the illegal taxation or extortion of minerals at points of access to mine sites, along transportation routes or at points where minerals are traded by upstream suppliers</p>	<p>Have any of the consulted stakeholders mentioned cases of money laundering? Do the investments into the mining, transport and trading operations come from legitimate actors and from clear formal business activities? Are the sources of funding subjected to Know Your Customer due diligence?</p>
<p>Regarding the payment of taxes, fees and royalties due to governments</p>	<p>We will ensure that all taxes, fees, and royalties related to mineral extraction, trade and export from conflict-affected and high-risk areas are paid to governments and, in accordance with the company's position in the supply chain, we commit to disclose such payments in accordance with the principles set forth under the EITI</p>	<p>Have any of the consulted stakeholders mentioned improper payment of taxes? Do mining operations pay their cadastral taxes? Do traders possess the appropriate licences to operate?</p>

IFC Performance Standards (additional items)		
Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts	To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimise and, where residual impacts remain, compensate/offset for risks and impacts to workers, affected communities, and the environment	Has the operator, or the operator purchasing from the operation, a risk evaluation and mitigation strategy?
	To ensure that grievances from affected communities and external communications from other stakeholders are responded to and managed appropriately	Are there pending grievances from the community? Are there adapted grievance mechanisms?
	To promote and provide means for adequate engagement with affected communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated	Are there adapted mechanisms to consult the community?
Performance Standard 2: Labour and Working Conditions	To promote the fair treatment, non-discrimination and equal opportunity of workers	Have any of the consulted stakeholders mentioned discrimination as to who can work there? What is the gender assignment of roles?
	To establish, maintain, and improve the worker–management relationship	Are there internal complaint mechanisms and other ways through which employees can communicate with management?
	To promote compliance with national employment and labour laws	Are there rules on the site on night mining? Depth of tunnels? Days of work per week? Freedom of association and collective bargaining? If yes, are those rules enforced systematically? By whom?
	To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties and workers in the client’s supply chain	What are the minorities present on site: ethnic, national, linguistic, gender, religious, migrant? What is the percentage of migrant labour?
	To promote safe and healthy working conditions, and the health of workers	Have any of the consulted stakeholders mentioned accidents on site? How many? Type and number of injuries? Number of deaths (any children)? Do the miners/workers wear shoes? Do the miners/workers wear dedicated PPE? What kind?

		<p>Have any of the consulted stakeholders mentioned health impacts from work? Are there practices mitigating these impacts?</p> <p>If PPE is required, is it enforced systematically? By whom?</p>
<p>Performance Standard 3: Resource Efficiency and Pollution Prevention</p>	<p>To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities</p>	<p>Have any of the consulted stakeholders mentioned any impacts from pollution? What type of pollution? Can it be attributed to mining or refining activities beyond reasonable doubt? From the sites observed?</p> <p>Have any of the consulted stakeholders mentioned any impacts from competition for resources? Which resource: water, land, timber? Can it be attributed to mining or refining activities beyond reasonable doubt? From the sites observed?</p> <p>Are there mechanisms to prevent pollution and competition for resources? If yes, describe</p>
<p>Performance Standard 4: Community Health, Safety, and Security</p>	<p>To anticipate and avoid adverse impacts on the health and safety of the affected community during the project's life from both routine and non-routine circumstances</p>	<p>Have any of the consulted stakeholders mentioned health impacts on the community? Can these be attributed to extraction and refining activities beyond reasonable doubt? From the sites observed?</p>
<p>Performance Standard 8: Cultural Heritage</p>	<p>To protect cultural heritage from the adverse impacts of project activities and support its preservation</p>	<p>Does the mining operation take place in the vicinity of an important cultural landmark for the miners?</p> <p>Does the mining operation take place in the vicinity of an important cultural landmark for the community?</p> <p>Does the mining operation limit the enjoyment of cultural rights (for example by blocking a path required to access the sites)?</p>
<p>CCCMC type 2 risks</p>		
<p>Type 2 risks NOT covered by OECD Guidance or IFC PS</p>	<p>5.2.1.6 Extracting or sourcing resources where a legal title, lease, concession or licence has been illegally obtained or violates national laws, or where there are pre-existing legitimate claims to the land by local populations, including those which are under customary, traditional or collective land tenure systems, or where the population residing in the extraction area has been involuntarily resettled (Related to Clause 2.4.3 of the Chinese Responsible Mining Guidelines)</p>	<p>Does the operation have a mining title?</p> <p>Are there indications that this title was obtained illegally or conflicts with pre-existing claims, including local community claims for non-mining activities?</p>

<p>5.2.1.9 Extracting or sourcing resources from WHSs or legally protected areas, or mining within the buffer zones of WHSs or legally protected areas; or transporting of mined resources through WHSs or legally protected areas, thereby providing a threat to the outstanding universal value for which these properties are protected (Related to Clause 2.7.13 of the Chinese Responsible Mining Guidelines)</p>	<p>Does the operation (including its transport component) take place within a protected area?</p>
<p>5.2.1.10 Failing to report, in a regular and timely manner to stakeholders, on their material impacts and disclose their ethical, social and environmental performance to their stakeholders in ways that are appropriate and meaningful to their needs. This includes a comprehensive view of their policies, risks and results with regard to ethical, environmental and social matters. It also includes proactively soliciting, respecting and responding to stakeholder feedback and expectations including those from NGOs and local communities (Related to Clause 2.1.5 of the Chinese Responsible Mining Guidelines)</p>	<p>Does the operation or the operator buying ASM minerals from it disclose information on its ASM supply at a site-specific level in line with step 5 of the OECD Guidance?</p> <p>Does the operator buying ASM minerals from the operation disclose information on its ASM supply at a non-site-specific level in line with step 5 of the OECD Guidance?</p>

Table 38 Information matrix based on S-LCA aspects not included in the table above (referring to stakeholder categories: local communities and workers)

		Performance indicator	Unit
Local community	Health and safety	Improvement of local infrastructure (e.g. telecommunications, road network, power and water supplies) due to mining activities	Yes/no <i>Please indicate type of improvement</i>
		Improvements in population's education/skills due to mining activities	Yes/no <i>Please indicate type of improvement</i>
		Improvement of local health services due to mining activities	Yes/no <i>Please indicate type of improvement</i>
		Programmes to enhance community health and safety	Number of programmes <i>Please indicate type of programme</i>
		Dependency on mine for sustaining local economy	Yes/no
	Local employment (and economy)	Local job creation/increased employment rate through company (direct job creation)	Number of additional jobs created/year
		Loss of industrial jobs typical of that area (e.g. agriculture or tourism) due to mining activity	Number of jobs lost/year
		Business and employment opportunities in other sectors (e.g. waste management) resulting from company's activity	Number of additional jobs created/year
		Activities to protect established industry sectors in this area	Number of activities/per year <i>Please indicate type of activity</i>
		Increase in exports and gross domestic product due to company activity	CDF/month or year
		Positive impacts on local community due to population growth and demographic change due to mining activity (e.g. gender balance)	Yes/no <i>Please indicate type of impact</i>
		Negative impacts on local community due to population growth and demographic change (e.g. migration influx)	Yes/no <i>Please indicate type of impact</i>
	Social benefits/losses	Family benefit – provision of programmes for the self-development of employees and their families (e.g. education programmes)	Number of programmes/year <i>Please indicate type of programme</i>
		Additional accidents due to mining traffic	Number of additional accidents/year <i>Please indicate type of accident</i>
		Inflation, rising cost of and reduced access to accommodation for population not related to mining company	Yes/no <i>Please indicate type of issue</i>
		Establishment and growth of informal settlements due to mining/company activity	Yes/no
	Cultural heritage and land rights	Loss of space used for recreational activities (e.g. sports)	km ² lost/year <i>Please indicate type of space</i>
		Presence of indigenous population in mining area	Yes/no
		Loss of space used by indigenous communities	km ² lost/year <i>Please indicate type of space</i>
		Agricultural and/or forest land bought by mining company for mining purpose	km ² of land/year
Discrimination	Activities to protect existing communities in the mining area (especially indigenous communities)	Number of activities/per year <i>Please indicate type of activity per population group</i>	

	Forced migration/resettlement and land rights	People/groups of people forced to resettle without compensation	Number of people/year <i>Please indicate population group</i>
		Occupied land without ownership (e.g. taken from indigenous communities)	km ² of land occupied/year
	Poverty	Activities for poverty alleviation due to mining activity	Number of activities/per year <i>Please indicate type of activity</i>
Workers	Health and social well-being	Average cases of mental health issues resulting from work	Number/year <i>Please indicate type of issue</i>
		Regular health checks for employees	Number/year and employee group <i>Please indicate employee group</i>
		Provision of free meals for employees	Number/month and employee group <i>Please indicate the kind of meal per employee group</i>
		Provision of sanitation facilities for employees	Yes/no
		Existence of a health and safety committee with participation of employees	Yes/no
	Wages	Living wage or prevailing wage	% of employees earning this wage <i>Please indicate amounts paid/month per employee group</i>
		Bonus paid	CDF/month or year <i>Please indicate to which employee group bonuses are paid</i>
		Overtime paid	Yes/no
		Remuneration/wages exceeding minimum wage	% of employees earning these wages <i>Please indicate amounts paid/month</i>
		Remuneration/wages undercutting minimum wage	% of employees earning these wages <i>Please indicate amounts paid/month</i>
		Pay gap between highest and lowest wage/salary paid	Ratio/year
		Equality of wages between men and women	Ratio/year and employee group <i>Please indicate employee group</i>
	Social benefits	Social benefits provided to employees (e.g. unemployment pay, health insurance, pension)	% of employees receiving social benefits <i>Please indicate type of benefits and employee group</i>
		Employee support – provision of memberships (e.g. gym) or living space (e.g. apartments)	% of employees receiving support <i>Please indicate type of support and employee group</i>
		Family benefit – provision of programmes for the self-development of employees and their families (e.g. education programmes)	Number of programmes <i>Please indicate type of programme</i>
	Working conditions	Contracted working hours per week	Average number of contracted hours/week and employee group <i>Please indicate employee group</i>
		Definition of core working time	Yes/no <i>Please indicate the hours for which a core working time is defined per employee group</i>

		Flexible working hours	% of employees having the option of flexible working time <i>Please indicate employee group</i>
		Permanent/temporary jobs	% of employees with permanent positions <i>Please indicate employee group</i>
		Stability of jobs	Average duration of employment <i>Please indicate employee group</i>
		Vacation days – number of regular vacation days	Average number of days/year and employee group <i>Please indicate employee group</i>
		Maternity protection	% of pregnant women in maternity protection <i>Only applicable to employees with direct family responsibilities</i>
		Parental or compassionate leave	% of employees on parental/compassionate leave <i>Only applicable to employees with direct family responsibilities</i>
		Nursery location available for employees' children	Number of places in nursery/number of employees <i>Only applicable to employees with direct family responsibilities</i>
		Average monitoring cycles performed by independent reviewer	Number/year <i>Please indicate type of monitoring person</i>
		Evidence of violation of laws and employment regulations	Cases/year and employee group <i>Please indicate employee group</i>
		Local people employed	% of local employees in the workforce <i>Please indicate employee group</i>
		Discrimination	Actions taken to increase staff diversity and/or to promote equal opportunities
Proportion of women in labour force	Ratio/year and employee group <i>Please indicate employee group</i>		
Proportion of women in high-responsibility roles	Ratio/year and employee group <i>Please indicate employee group</i>		
Freedom of association and collective bargaining	Memberships in associations able to organise themselves and/or bargain collectively	% of employees having a membership	
	Employees have the right to form associations	Yes/no	
	Employees have the right to organise collective bargaining activities	Yes/no	
	Employees have the right to strike	Yes/no	
	Employer does not hinder or interfere but proactively informs employees about their right to organise themselves and bargain collectively	Yes/no	
Training and education	Apprenticeships – finished and/or started	Number of apprenticeships/year and employee group <i>Please indicate type of apprenticeship and employee group</i>	

		Training of employees	Average hours of training/year and employee group <i>Please indicate type of training and employee group</i>
		Appropriate training/introduction before job entry	% of employees receiving training/year and employee group <i>Please indicate type of training and employee group</i>
	Job satisfaction and engagement +	Job satisfaction and engagement survey	Yes/no <i>Please indicate percentage of employees participating in the survey</i>

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