UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Technical and statistical report

The implications of critical energy transition minerals for women's participation in the mining sector

Insights from the Democratic Republic of the Congo and Indonesia

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Introduction

This study examines women's participation in the cobalt value chain in the Democratic Republic of the Congo and nickel value chain in Indonesia. As the demand for Critical Energy Transition Minerals (CETM) intensifies due to their essential role in low-carbon technologies, the two countries are central to the global supply of cobalt and nickel, respectively.

The transformation brought about by increased extraction, processing, and trade of these minerals presents both opportunities and challenges for women's integration into this high-value sector. It is essential to ensure that women are not excluded from the emerging economic opportunities that this growth represents. The shift toward more technical and better-paying jobs, particularly in downstream segments, offers a strategic entry point to invest in women's education and training, enabling them to access higher-quality employment and contribute to broader economic growth and inclusiveness. At the same time, efforts must improve the conditions of women already working in artisanal and small-scale mining, where they often face unsafe, low-paid, and physically demanding work. Advancing gender equality in mining requires both expanding opportunities in new roles and improving livelihoods in existing ones, which are critical steps toward building a more inclusive, sustainable, and competitive mining industry.

This report presents the Democratic Republic of the Congo and Indonesia as case studies to explore women's participation in the sector. In the Democratic Republic of the Congo, the cobalt value chain remains at an early stage, yet it has significant potential to expand and generate more equitable benefits that could contribute to women's fairer integration in this sector. In contrast, Indonesia's nickel sector has advanced further along the value chain, with active policies to promote domestic processing and industrialisation. Here too, the potential for women's more beneficial integration is high, provided the right policy frameworks are in place.

By comparing these two distinct experiences - each shaped by different socio-economic contexts and policy choices - the study aims to assess whether the current models of value chain development have led to different outcomes for women's economic participation, and how such outcomes might inform more inclusive approaches moving forward. The analysis offers insights not only for Democratic Republic of the Congo and Indonesia but also for other countries experiencing similar transformations related to CETM.

It is worth noting that data limitations remain a key obstacle to gaining a clearer picture of women's roles in the selected mineral value chains, especially with respect to employment and entrepreneurship in the informal and artisanal mining sector. Indirect employment in ancillary work is also particularly challenging to track. Although existing data and research underscore gender disparities in the mining sector overall, lack of more granular data makes it difficult to present a detailed assessment. In the absence of data specific to the cobalt and nickel sectors, the study draws on data from the broader mining sector or other value chains where appropriate.

The structure of the report is as follows: Chapter 1 provides an overview of the global demand for CETM, highlighting the broader opportunities and challenges for developing countries. Chapters 2 and 3 present the profiles of the cobalt and nickel value chains in the Democratic Republic of the Congo and Indonesia, respectively, along with an analysis of women's participation both within these sectors and in related areas. Chapter 4 draws on key insights from the two case studies. Finally, Chapter 5 concludes with final considerations to support the countries in advancing gender-responsive value chain development.

1

Global demand for Critical Energy Transition Minerals (CETM): Opportunities and challenges for developing countries

1. Global demand for Critical Energy Transition Minerals (CETM): Opportunities and challenges for developing countries

1.1 The sustainable energy revolution: Trade and development implications

The global shift towards clean energy is driving an unprecedented surge in demand for minerals that are crucial for technological advancements. Critical energy transition minerals (CETM) such as lithium, cobalt, nickel, copper, and rare earth elements are essential to produce batteries, wind turbines, solar panels, and electric vehicles. Mineral-rich developing countries are increasingly found at the centre of strategic supply chains (UNCTAD, 2023a).

It is estimated that the achievement of net-zero emissions targets by 2030 and the resulting demand for minerals, will require around 80 new copper mines; 70 new lithium and nickel mines, each; and 30 new cobalt mines (IEA, 2023). This has already significantly increased investments in this area. For instance, the number of new mining projects in critical minerals announced in 2021–2022 was more than double the total of the previous decade (UNCTAD, 2023a).

For many developing countries, which hold large shares of the world's reserves of these critical minerals, these trends present both a historic opportunity as well as a challenge. On the one hand, mineral-rich countries are in high demand as key players in supply chains. Africa alone possesses about 25 per cent of global reserves of critical minerals, and 19 per cent of those needed specifically for electric vehicles. Countries like the Democratic Republic of the Congo and Indonesia are the world's largest suppliers of cobalt and nickel, respectively (UNCTAD, 2023a), whereas the Latin American "Lithium Triangle" (spanning the Plurinational State of Bolivia, Argentina, and Chile) contains over half of global lithium resources (ECLAC, 2023; UNDP, 2022). This highlights the key role of countries in the Global South in providing the inputs that are necessary for the clean energy transition. With increasing demand, developing countries with natural resources endowments are well positioned to leverage critical minerals for economic growth.

On the other hand, there is a risk that some countries may remain locked into their traditional role as commodity exporters, benefiting only marginally from rising demand while missing out on opportunities for processing and value chain development. Stronger demand for critical minerals could also worsen the socioeconomic challenges of commodity dependence, including income volatility, political instability, overvalued exchange rates, and limited diversification. Adding value locally, however, requires countries to invest in processing to be able to capture larger profits than those accrued from the exports of raw materials, creating opportunities for downstream industries development and job creation (UNCTAD, 2023a).

Some countries are taking steps to leverage their natural resources endowments to maximize local value addition. Indonesia, for instance, has introduced a set of policies for supporting value addition, including an export ban on unprocessed nickel ore, the requirement for foreign buyers to invest in local processing, fiscal incentives, and investment promotion measures (UNCTAD, 2024).

> Stronger demand for critical minerals could worsen the socio-economic challenges of commodity dependence

It should be noted, however, that diversification can only bring economic benefits when underpinned by inclusiveness and sustainability considerations, as also stressed by the Principles to Guide Critical Energy Transition Minerals released by the United Nations-convened Panel on Critical Energy Transition Minerals (see Box 1). Increasing levels of extraction and processing may risk widening inequalities if industrial policies do not identify and mitigate the accompanying environmental and social impacts (UNCTAD, 2023b).

Box 1
The United Nations Secretary-General Panel on Critical Energy Transition Minerals

In April 2024, during COP28, the United Nations Secretary-General announced the establishment of a Panel on Critical Energy Transition Minerals, bringing together governments, intergovernmental and international organisations, private sector and civil society. The Panel was tasked with the development of a set of global principles that would guide countries, private actors in the extractive sector, the United Nations and other stakeholders to address emerging challenges linked to energy transition minerals value chains.

On 11 September 2024, the SG Panel on Critical Energy Transition Minerals released its report titled "Resourcing the Energy Transition: Principles to Guide Critical Energy Transition Minerals towards Equity and Justice", outlining the following Guiding Principles based on existing international norms, commitments, and legal obligations:

- Principle 1: Human rights must be at the core of all mineral value chains.
- Principle 2: The integrity of the planet, its environment and biodiversity must be safeguarded.
- Principle 3: Justice and equity must underpin mineral value chains.
- Principle 4: Development must be fostered through benefit sharing, value addition and economic diversification.
- Principle 5: Investments, finance and trade must be responsible and fair.
- Principle 6: Transparency, accountability and anti-corruption measures are necessary to ensure good governance.
- Principle 7: Multilateral and international cooperation must underpin global action and promote peace and security.

To advance the implementation of the Guiding Principles, the SG Panel put forward the following actionable recommendations, which include the establishment of:

- A global framework for traceability, transparency, and accountability along the CETM value chain.
- A Global Mining Legacy Fund to tackle the challenges posed by abandoned or neglected mines.
- An initiative to support and empower artisanal and small-scale miners.
- Equitable targets and timelines for the implementation of material efficiency and circularity approaches along the value chain.

Source: https://www.un.org/en/climatechange/critical-minerals

1.2 Towards gender equality in mining: why women must be part of this evolving sector

The growing global demand for CETM may offer opportunities for women's more beneficial integration into the sector, from the initial stages of extraction to downstream processing and manufacturing. Yet, the growth of this sector does not automatically lead to inclusive outcomes. Without deliberate policy measures, emerging economic activities risk perpetuating or even exacerbating existing gender disparities (UNCTAD, 2023a).

Women have historically been underrepresented in this male-dominated sector due to a range of factors, including gender bias and discrimination, limited access to skills and entrepreneurship opportunities, underrepresentation in governance and leadership roles, and the physically demanding nature of the work (ILO, 2021; UN Women, 2016). Employment in the mining sector is also often perceived as unattractive to women due to a combination of harsh working conditions, significant safety risks, and the remote and isolated locations of most mining operations. These factors act as strong deterrents, particularly in contexts where social norms already discourage women from pursuing careers in extractive industries (IGF, 2023b).

The ongoing transformation, especially in downstream segments, is creating a range of new employment opportunities that often require technical skills and offer higher wages and improved working conditions, making mining jobs more attractive - including for women. The increasing demand for technical skills within the sector provides a strategic entry point to invest in women's education and training. Enabling women to develop these skills can enhance their access to better-quality employment in mining, advancing women's economic participation and taking full advantage of the country's labour potential (IGF, 2023b).

Moreover, it is crucial to improve the conditions of workers already engaged in the sector. Women in the mining sector are largely concentrated in artisanal and small-scale roles, working under harsh, unsafe, and low-paid conditions. This is particularly evident in regions where few alternative livelihood options are available. Efforts should also focus on improving the situation of women in these precarious and physically demanding roles by ensuring access to decent and safe work and fair remuneration (World Bank, 2023).

Ultimately, advancing gender equality in mining calls for a dual approach: expanding opportunities for women to access higher-quality jobs in emerging segments, while also improving the livelihoods of those already in the sector through targeted policies.

Besides building a more equitable and sustainable mining industry, addressing gender-specific barriers in the sector is also critical to attract responsible investments and strengthening countries' competitiveness. Studies documenting the experiences of private sector entities in the mining industry provide evidence supporting the business case for better integration of women into the sector. For example, better female representation on executive boards has been linked to increased performance and improved transparency related to environmental, social, and governance (ESG) indicators (White and Case, 2023). There is also evidence to show that women are more likely to adhere to health and safety protocols (World Bank, 2024c). Lastly, research also reveals that promoting the use of local- and women-owned businesses as suppliers can have consequential impact on growth, economic development and stability in local communities, which points to the important role of mining companies in driving positive outcomes for women (World Bank, 2024c).

Advancing gender equality in mining calls for a dual approach: expanding opportunities for women to access higher-quality jobs in emerging segments, while also improving the livelihoods of those already in the sector through targeted policies.

1.3 CETM value chain development and women's participation in the sector

The mining sector in many developing countries relies on both artisanal and small-scale operations (ASM) and large-scale operations (LSM). Artisanal and small-scale mining includes informal or partially formal mining activities performed by individuals or cooperatives in specifically designated areas, typically by means of simple tools and equipment (UNEP, 2020). ASM is a labour-intensive activity and is an important source of livelihoods, contributing to income generation and poverty reduction in many developing countries (UNEP, 2020; World Bank, 2024d). ASM often involves the significant participation of women in various roles, from extraction to minor processing. According to estimates, women constitute up to 30–50 per cent of ASM operations in some regions (IGF, 2018), a much larger proportion of women's employment levels in the large-scale industrial segment. ASM workers are typically informal, have low productivity, face challenges in accessing technology and finance, and may work in conditions that pose serious risks to their safety and health (World Bank, 2023). Women in ASM perform tasks such as panning, ore sorting or minor processing, engage in small-scale informal trade of minerals, and work as providers of services such as food preparation and other ancillary services, or support machinery maintenance at mining sites (IGF, 2018).

The increasing demand for critical minerals poses both challenges and opportunities for small scale and artisanal mining. An expansion of the sector may offer significant opportunities to integrate ASM workers into global supply chains on more equitable terms through the improvement of working conditions, compliance with standards and formalization. At the same time, intensified mining operations that do not prioritize inclusive growth may further worsen the already difficult conditions faced by ASM workers, and may risk missing the opportunity to achieve increased productivity and better working conditions (World Bank, 2020).

Large-scale mining, on the other hand, usually involves large capital investments and industrial scale operations performed through technology intensive extraction and processing. Unlike ASM, industrial operations contribute to a lesser extent to total employment in the sector[1] (IISD, 2017), while contributing significantly to export revenues and government income through taxes and royalties. LSM is a male dominated sector, with estimates suggesting that women represent less than 10 per cent of the global workforce (ILO, 2021; International Women in Mining, 2017). Women are typically concentrated in administrative, clerical, and support services, and significantly less in technical and managerial roles. The expansion of critical minerals value chains offers both challenges and opportunities. If concerns related to female representation in the sector are prioritized, women could greatly benefit from the creation of new roles, particularly in downstream segments offering skilled technical positions or in leadership and entrepreneurship roles. Conversely, if new opportunities benefit primarily male workers, there is a risk to exclude women and perpetuate gender gaps in the sector.

As critical minerals value chains evolve through technological advancement, there is a risk that women's participation may be negatively impacted. Structural transformation and technological change have often been linked to a "defeminization of labour," particularly in countries reliant on manufacturing exports. As industries upgrade from

[1] An estimated 40.5 million people were directly engaged in ASM in 2017, compared to 30 million in 2014. On the other hand, the industrial sector employed only 7 million people in the same year (IISD, 2017).

labour-intensive to higher value-added activities, women are at risk of being displaced from existing roles or excluded from entering these industries altogether (ILO, 2019; Tejani S, Kucera D, 2021).

Research on export-oriented sectors—such as food and beverages, apparel and footwear, and motor vehicles — has shown a declining share of female labour participation (Tejani S., Kucera D, 2021). This trend is often driven by gendered assumptions about skills and qualifications, stereotypes about productivity in male-dominated roles, and persistent gender gaps in access to high-skilled, better-paid positions (Seguino, S. and E. Braunstein, 2018; Tejani S, Kucera D, 2021).

Technological advancements in critical mineral value chains could reproduce patterns seen in manufacturing, where women's participation has tended to stagnate or decrease as industries modernize (IMF, 2019). In countries with significant artisanal and small-scale mining (ASM), growing upstream activity may deepen women's concentration in informal, low-productivity roles—especially if poor working conditions persist and the benefits of sectoral growth are unevenly distributed. Moreover, the expansion of large-scale mining into areas traditionally mined by small-scale workers may displace both small-scale miners and service providers, many of whom are women, thus eroding key sources of livelihood.

Downstream, the development of processing and refining industries could also leave women behind unless structural barriers—such as occupational segregation and gender gaps in skills—are addressed to enable equitable access to better jobs.

However, technological change also presents opportunities to shift gender dynamics in mining. As the sector modernizes and demands higher qualifications in safer, more regulated environments, the need for physical strength—a traditional barrier to women's entry—diminishes. These changes could facilitate greater participation of women and improve gender outcomes if accompanied by targeted policies and capacity-building (Abrahamsson L, 2019).

1.4 Governance in the mining sector: Towards gender-responsive approaches

Establishing robust governance and regulatory frameworks is crucial to managing CETM resources sustainably. Transparency mechanisms, international standards, and rigorous impact assessments can contribute to improving overall sector management. They are also crucial in helping address effectively gender disparities and responding to women's rights and needs, particularly in countries where mining activities are critical for the whole economy and local livelihoods.

Most mining codes often still lack provisions in support of women's more equal and beneficial participation in the mining sector (World Bank, 2023). National mining codes are a set of laws and regulations established by Governments to govern the management, preservation, exploration, exploitation, and processing of minerals for domestic consumption and export. They include land tenure rights and responsibilities, health and safety protocols, and environmental regulations. Laws and regulations related to the mining sector can either be gender sensitive and inclusive, aiming to promote gender equality in the mining sector, or conversely be gender-blind, perpetuating barriers to women's equal rights and successful participation in the mining sector (World Bank, 2023). A review of over 30 national mining codes and land ownership frameworks highlighted that more than two thirds of the mining codes do not support women's access and control over mining resources (World Bank, 2023).[2]

> Most mining codes often still lack provisions in support of women's more equal and beneficial participation in the mining sector

Moreover, certain national legislation historically enacted to protect women

[2] World Bank, 2023. Available at: https://stateofthesector23.delvedatabase.org/.

from hazardous working conditions, still maintain explicitly discriminatory provisions, for instance banning women from working underground (World Bank, 2023). This is despite the abrogation of the ILO convention No. 45 of 1935, which prohibited women to be employed on underground work.[3]

Nevertheless, modern mining codes are increasingly including non-discrimination clauses, ensuring that women have equal rights and encouraging companies to comply with national labour laws prohibiting gender-based discrimination in employment, wages, and working conditions. For instance, South Africa's Mining Charter of 2002 introduced a quota requiring at least 10 per cent of mining staff to be female by 2009, whereas later iterations introduced targets for women's representation in managerial positions and procurement from women-owned suppliers (IGF, 2023b). Other governments have also introduced gender quotas through legislation, for example Sierra Leone's 2009 Mines and Minerals Act[4] and the United Republic of Tanzania's 2010 Mining Act[5], both requiring women's representation in Mining Advisory Boards. Similarly, in its 2015 Mining Code, Burkina Faso introduced provisions for ensuring equal access to education and training for women, as well as initiatives to support women's participation in decision-making processes related to mining activities (AMDC, n.d).

The Africa Mining Vision (AMV) adopted by African Union states in 2009 refers to gender inclusiveness as one of the dimensions of sustainable governance of the mining sector and lists "progress towards gender equity and the empowerment of women" as one of the short-term (less than 5 years) objectives of the AMV.[6] The actions related to this goal include the integration of gender equity in mining policies, laws, regulations, standards and codes at the national level as well as the adoption and implementation of sub-regional and continental gender charters for the mining sector at the regional and continental levels.[7] The AMV also calls for gender equality in the context of the goal of fostering the establishment of resilient artisanal and small-scale mining communities. While countries such as Lesotho, Mozambique and the United Republic of Tanzania have made significant advancements in adopting the AMV into national legislation through the development of their country mining vision (Mutemeri N, 2024), evidence related to the implementation of objectives related to gender is more limited. In the United Republic of Tanzania, for example, the government supports women in ASM through awareness campaigns, while the Tanzania Women Miners Association offers financial assistance and training (Mutemeri N, 2024). Overall, progress on these goals has been uneven – highlighting the need for supporting states in building the capacity to implement adequate policies.

Beyond government policy, private sector initiatives can also contribute to foster gender equality in mining. These may include addressing internal employment and pay gaps, establishing inclusive networks and mentoring programmes; providing suitable work arrangements and support such as childcare; and taking steps to end violence, bias, and discrimination in work, among others (ILO, 2021).

In this regard, ESG frameworks are critical in guiding corporate governance in operating more responsibly. Responsible mining standards can serve distinct purposes, for instance ensuring that minerals are

[3] The convention was found outdated and prohibitive, contributing to the socially constructed norm that mining is men's work, which puts many women at a disadvantage. As a result, it was abrogated at the 112th Session of the International Labour Conference in June 2024 (World Bank, 2023; ILO, 2024).

[4] The Mines and Minerals Act, 2009. Available at: https://www.sierra-leone.org/Laws/2009-12.pdf.

[5] The Mining Act, 2010. Available at: https://www.a-mla.org/en/country/pdf/8.

[6] African Mining Vision, 2009. Available at: https://au.int/sites/default/files/documents/30995-doc-africa_mining_vision_english_1.pdf.

[7] African Mining Vision, 2009. Available at: https://au.int/sites/default/files/documents/30995-doc-africa_mining_vision_english_1.pdf.

sourced responsibly and ethically, or meeting specific benchmarks related to environmental protection, worker safety, and social responsibility. They can also offer overarching voluntary frameworks grounded in ethical principles, such as the United Nations Guiding Principles on Business and Human Rights (IGF, 2024a). A notable example of a responsible mining standard integrating gender requirements is the Initiative for Responsible Mining Assurance (IRMA),[8] which mandates that companies must not discriminate against women, create work environments that are mindful of women's needs and vulnerabilities, and assess gender equality as part of their impact assessments (IRMA, 2022).

Alongside initiatives to advance ESG goals, frameworks such as the Extractive Industries Transparency Initiative (EITI),[9] contribute to promote transparency and accountability in extractive sectors, including – among others, provisions that aim to improve the participation of women in extractives sector management and encourage the publication of data by gender (EITI, 2023).

As part of an effective governance of the mining sector, rigorous environmental and social impact assessment are critical to assess the social and environmental challenges related to the rapid expansion of the mining sector. The areas near mines become more subject to challenges related to rapid urbanization, land use, and air and water pollution, damaging fish populations and contributing to health problems among workers and residents of mining communities (RAID & Afrewatch, 2024; Squadrone et al., 2016). Migration to mining communities may exacerbate informal urbanization and criminality (Rodrigues et al., 2021; Sovacool, 2021), while practices such as evictions to make way for the expansion of mining sites have also been reported (Amnesty International & IBGDH, 2023).

These challenges affect men and women differently, making it essential to assess gender-specific impacts to support more inclusive sectoral development. Gender can be integrated into mining impact assessments through several channels: by incorporating gender analysis into standard environmental and social impact assessments, conducting standalone gender impact assessments, or including gender considerations within broader human rights due diligence frameworks (IGF, 2022). However, evidence suggests that few governments, mining companies or other stakeholders routinely assess gender impacts (Responsible Mining Foundation, 2022). The experience with ex-ante gender impact assessments of trade policies suggests that these tools are highly effective in evaluating the differentiated effects of a given policy on men and women prior to its implementation, allowing for the introduction of accompanying measures to mitigate negative impacts and contributing to more effective and informed policy design (UNCTAD, 2017a).

Few governments, mining companies or other stakeholders routinely assess gender impacts

The following analysis presents two case studies that explore the experiences of the Democratic Republic of the Congo and Indonesia within the cobalt and nickel value chains, respectively. By taking a closer look at the role of women in each context, this desk analysis aims to examine how women participate across different segments of these value chains, the extent to which they are benefiting from the growing global demand for critical energy transition minerals, and the opportunities—or limitations—this expansion presents for them. The goal is to shed light on both the structural barriers women face and the potential entry points for more inclusive growth in the CETM sector.

[8] IRMA brings together 101 companies across 36 countries as part of a multi-stakeholder effort to address environmental and social issues in mining. It conducts independent evaluations of social and environmental performance at mine sites globally.

[9] EITI is implemented by countries through multi-stakeholder groups including governments, companies, and civil society. Within the initiative, the EITI Standard offers a set of specific rules and requirements that participating countries must follow to be considered compliant – covering public disclosure of contracts, licenses, revenues, etc.

2

Women and the cobalt sector in the Democratic Republic of the Congo

2. Women and the cobalt sector in the Democratic Republic of the Congo

2.1. Cobalt sector profile: an overview

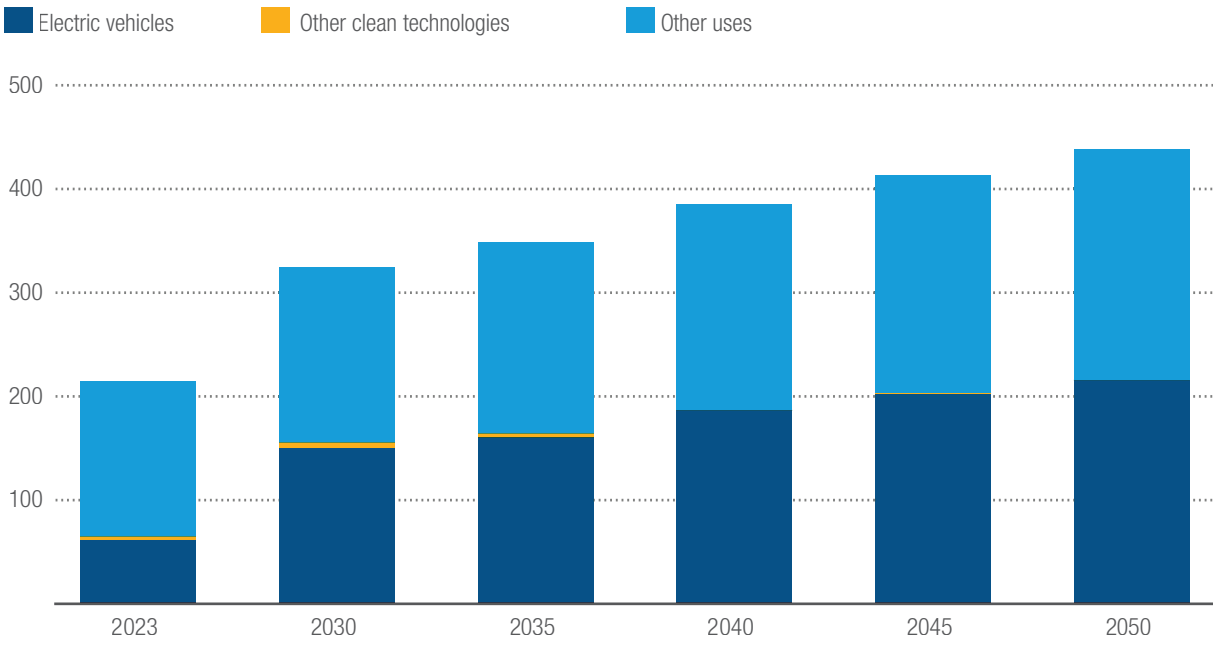
Global demand for cobalt is forecast to more than double within the next three decades. This is largely due to its use in lithium-ion batteries in electric vehicles, for which demand is expected to grow by 249.3 per cent between 2023 and 2050, while demand for other industrial uses grows by 47.9 per cent (Figure 1). Demand for cobalt from other clean technology uses – including low emissions power generation, grid battery storage, and hydrogen technologies – is already only 1.2 per cent of the total and is expected to decline further (IEA, 2024).

The Democratic Republic of the Congo holds more than half of global cobalt reserves, which are mostly mined as a byproduct of copper and nickel production. These reserves are concentrated in the east of the country, a region particularly affected by conflict and instability. The sector accounts for around 9 per cent of GDP and is one of the most important sources of fiscal revenues (World Bank, 2021a). In recent years, the Democratic Republic of the Congo has consistently been responsible for about 90 per cent of global trade in cobalt oxides and hydroxides, two intermediate products after cobalt is mined (Figure 2), which have undergone basic processing to reduce bulk for transport.

Figure 1

Forecast demand for cobalt is expected to more than double between 2023-2050

Kilotonnes



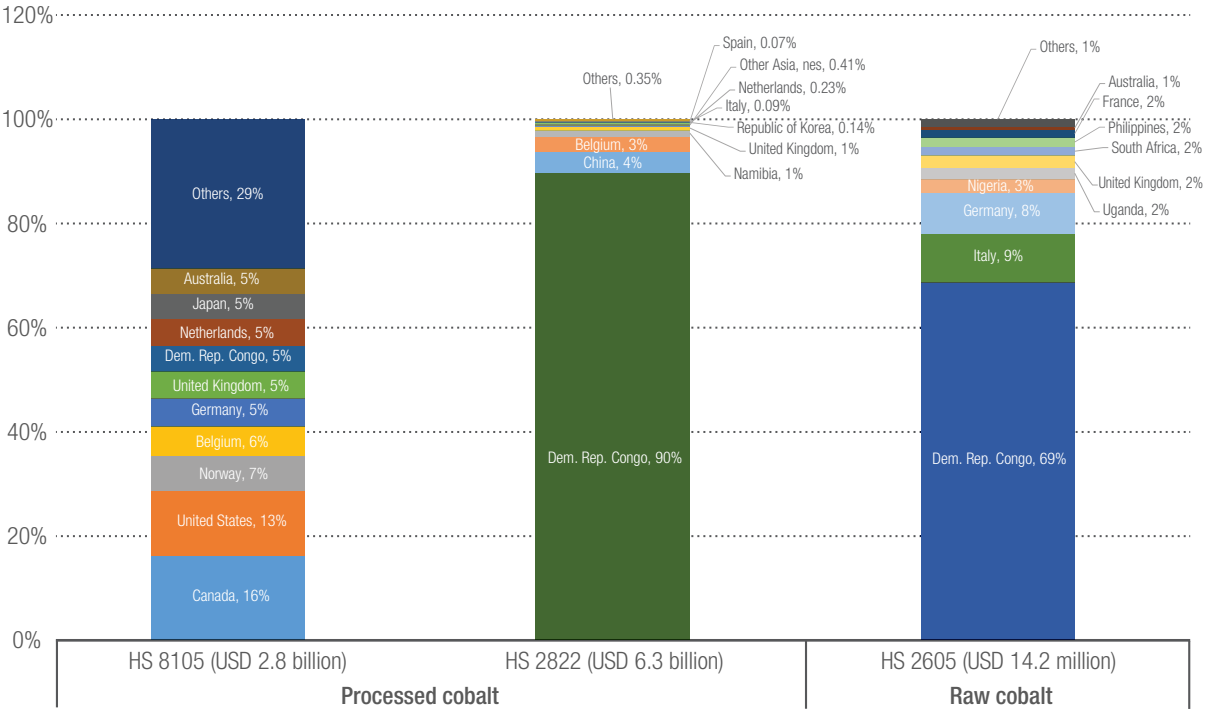
Source: IEA.

Note: Other clean technologies include low emissions power generation, grid battery storage, and hydrogen technologies.

Figure 2

The Democratic Republic of the Congo is one of the largest exporters of selected cobalt products, 2021

Percentage of global exports



Source: Comtrade.

Note: HS 2605 includes cobalt ores and concentrates; HS 2822 includes cobalt oxides and hydroxides; and HS 8105 includes mattes and other intermediate products of cobalt metallurgy and cobalt articles thereof, including waste and scrap.

The extractive sector as a whole accounts for close to half of government revenues in the Democratic Republic of the Congo (EITI, 2024). Mining has also been the Democratic Republic of the Congo's most important recipient of investment inflows, and the cobalt sector in particular attracts a significant share of foreign direct investment (World Bank, 2021a). The country is expected to remain the dominant source of supply in the future (Cobalt Institute, 2024).

Domestic processing has mostly been limited to the production of intermediary products, such as crude cobalt hydroxide, for export (UNCTAD, 2020). Manufacturing, including the production of battery materials from processed cobalt and other activities along the value chain including the manufacturing of cell components, battery packs, and completed electric vehicles take place far from the Democratic Republic of the Congo, in particular in China, the Republic of Korea, the United States, and Germany and other European countries (UNCTAD, 2023b).

Limited processing capacity has constrained the ability to turn resource wealth into development gains through domestic value addition and new manufacturing sectors. The government is interested in fostering the development of more downstream activities within the country. The creation of a transboundary battery and electric vehicle special economic zone between the Democratic Republic of the Congo and Zambia was announced in 2024. While there is no available information on gender-specific concerns associated

with this initiative, the project is expected to boost domestic value addition, export diversification and value chain development, job creation, and foreign investment (UNECA, 2024; UNCTAD, 2023a).

Both ASM and LSM contribute to overall cobalt output in the Democratic Republic of the Congo. According to official statistics of the National Employment Office, the mining sector in the Democratic Republic of the Congo employed 157,297 workers in 2021, although these figures are considered to be underreported and do not capture informal activities (EITI, 2024). The extent of employment in artisanal and small-scale mining is more difficult to measure, given the predominantly informal nature of this activity. A commonly-cited estimate suggests that 150,000 to 200,000 people are directly employed in cobalt ASM (IIED, 2021).[10] ASM output was estimated at only 10 per cent of the total supply of the Democratic Republic of the Congo (Cobalt Institute, 2024).[11] Indeed, most cobalt in the Democratic Republic of the Congo is produced by large-scale industrial mines operated by multinational companies.

ASM cobalt mining often takes place on concessions from large-scale mines (IGF, 2024b). Artisanal mining zones are established by the Ministry of Mines, though these may be closed and replaced by LSM operations if a sufficient deposit is discovered, undermining the operations of ASM workers.[12] (Traoré et al., 2024). The Mining Code requires that artisanal miners be members of registered cooperatives, who have the legal right to sell ASM output. Cooperatives also play a role in managing workers, guarding the site, and ensuring safety (OECD, 2019).

Mining attracts many workers in the Democratic Republic of the Congo due to the prospect of higher incomes compared to other sectors. However, living costs in mining areas are high, and most jobs are low-skilled and precarious.[13]

2.2. Women in cobalt mining

The gendered outcomes of global cobalt development trends are varied. Increased extraction and production, and rising demand for other goods and services as inputs in the cobalt value chain may create opportunities for women. However, existing gender imbalances and vulnerabilities - including with respect to economic participation (Box 2) and the limited development of the cobalt value chain in the Democratic Republic of the Congo limit the potential benefits for women working in the sector. Growing cobalt production may also risk worsening inequalities in the absence of gender sensitive approaches to the sector development.

[10] A variety of workers are active at ASM sites. They include license holders, sponsors who finance digging, crew supervisors, diggers, and other individuals working in different roles (ISID, 2017). Traders purchase full bags of ore and sell these at depots and may finance excavation work (IMPACT, n.d.-a). Others working in or near mining sites may include other intermediaries, as well as ancillary workers providing goods for personal consumption or production such as water and food (ISID, 2017).

[11] Other, less commonly cited, estimates suggest that the ASM share could be up to 30 per cent of total cobalt output in the Democratic Republic of the Congo (WEF, 2020).

[12] Art. 110. Mining Code of the Democratic Republic of the Congo, 2018. Available at: https://eiti.org/documents/mining-code-democratic-republic-congo.

[13] One of the lowest-income countries in the world, an estimated 73.5 per cent of the population in the Democratic Republic of the Congo lived on less than USD 2.15 per day in 2024 (World Bank, 2024).

Box 2
Women's participation in the Congolese economy: A snapshot

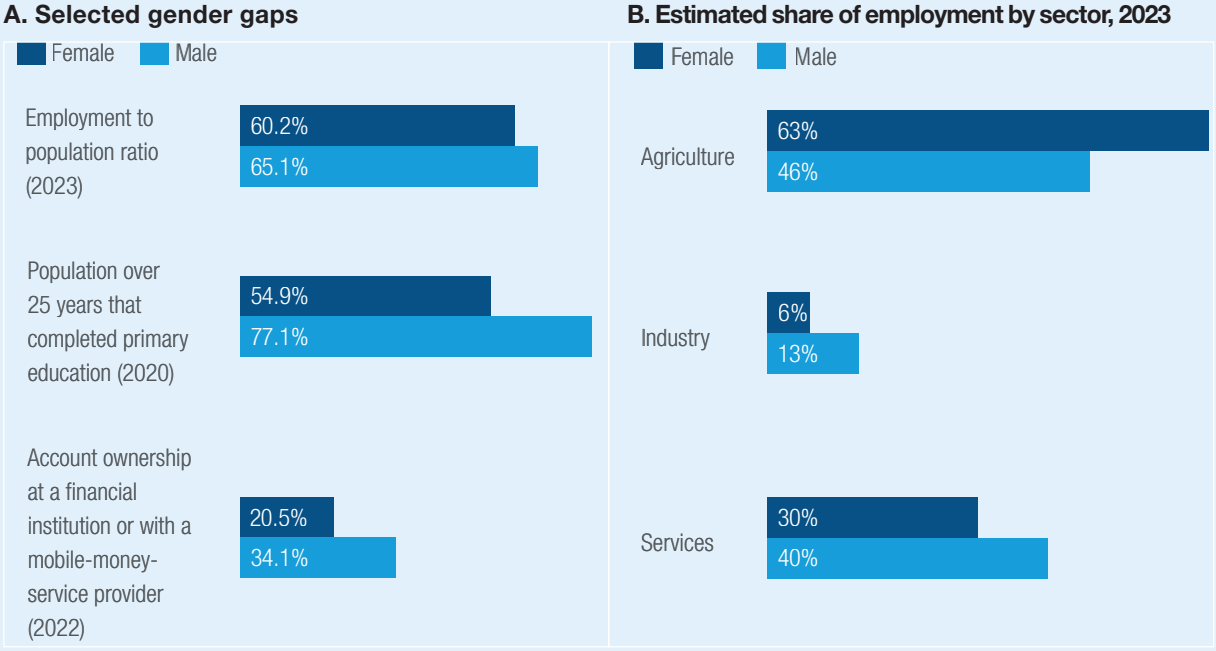
While women are highly active in the economy of the Democratic Republic of the Congo, they face several barriers to benefitting fully from economic opportunities. The female employment to population in the Democratic Republic of the Congo is relatively high. Although it remains lower than the male ratio, the gender gap is narrower than the average for low-income and sub-Saharan African countries (Figure 3). However, nearly two-thirds of employed women work in agriculture, which includes subsistence and poorly-paid employment (World Bank, n.d.). Wage equality for similar work is low in comparison with the rest of the world (WEF, 2023).

Many women run small businesses or are self-employed, though these income sources tend to be more precarious and subject to gender-based barriers. Self-employment and other vulnerable forms of work are particularly common among women, accounting for an estimated 88.2 per cent of female employment and 77.3 per cent of male employment in 2023 (World Bank, n.d.). Self-employed workers, regardless of gender, typically earn less than salaried employees in the Democratic Republic of the Congo (Batana et al., 2021). Furthermore, women-led businesses tend to generate lower profits than those run by men due to their smaller scale and the types of activities involved. Compared to the regional average in sub-Saharan Africa, women in the Democratic Republic of the Congo are less likely to be business owners or top managers, tend to hire fewer workers, and are more likely to run home-based enterprises (World Bank, 2021b).

The potential of women is held back by their limited access to education and financial resources. Although the gender gap in education is narrowing, only 55 per cent of women 25 years and older had completed primary-level education in 2020, compared with 77.1 per cent of men. Rates of account ownership for women (20.5 per cent of women ages 15 years and older) were 13.7 percentage points below those of men in 2022 (World Bank, n.d.).

Overall, the Democratic Republic of the Congo ranks 151out of 162 countries on the United Nations Gender Inequality Index (GII), which assesses disparities in reproductive health, empowerment, and labour market participation (UN Women, n.d.-a).

Figure 3
Selected economic indicators in the Democratic Republic of the Congo show gender gaps



Source: World Bank, World Development Indicators.

2.2.1. Women's participation in the cobalt value chain

According to official statistics of the National Employment Office, women constitute 13 per cent of workforce in the mining sector overall (EITI, 2024). However, women are predominantly concentrated in ASM, with estimates suggesting up to 40 per cent of female participation in this segment, as shown in Figure 4 (World Bank, 2017). Women working in artisanal and small-scale mining fill roles that are lower-productivity, and are typically involved in mineral cleaning, processing, and transporting, performing some of the most strenuous or poorly-paid work (World Bank, 2015). Women are often excluded from digging (Baumann-Pauly, 2023; IIED., 2021).

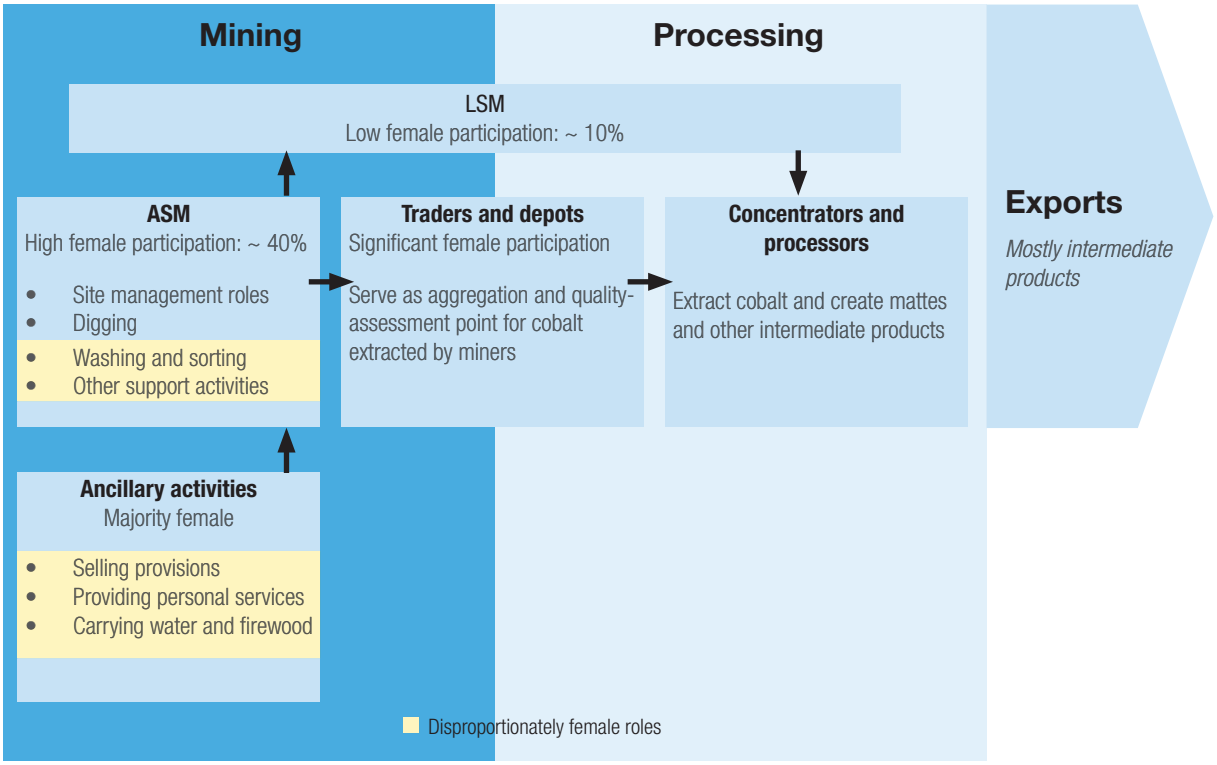
ASM mining offers women better incomes than most rural jobs (Paschal & Kauangal, 2023), prompting many to migrate - either with family or independently - in search of opportunity or to escape instability and poverty. Others take up mining locally, either replacing or supplementing agricultural work (Bashwira et al., 2014).

A survey conducted by the Institute for the Study of International Development (ISID) on ASM mining in the Democratic Republic of the Congo, Rwanda, and Uganda provides detailed insights into women's participation into the artisanal segment of tin, tantalum, tungsten, and gold mining value chains. The findings indicate that women are predominantly engaged in tasks such as grinding, washing, and transporting ore, while they remain under-represented in roles

Women are predominantly concentrated in artisanal and small-scale mining, with estimates suggesting up to 40 per cent of female participation in this segment

Figure 4

Stylized mapping of employment by gender in the cobalt value chain of the Democratic Republic of the Congo



Source: UNCTAD.

Note: "Disproportionately female roles" refers to occupations in which women tend to be overrepresented, relative to the whole sector, which is significantly male-dominated. As such, most of these roles are not necessarily filled by women. Ancillary activities are treated as separate but connected to ASM.

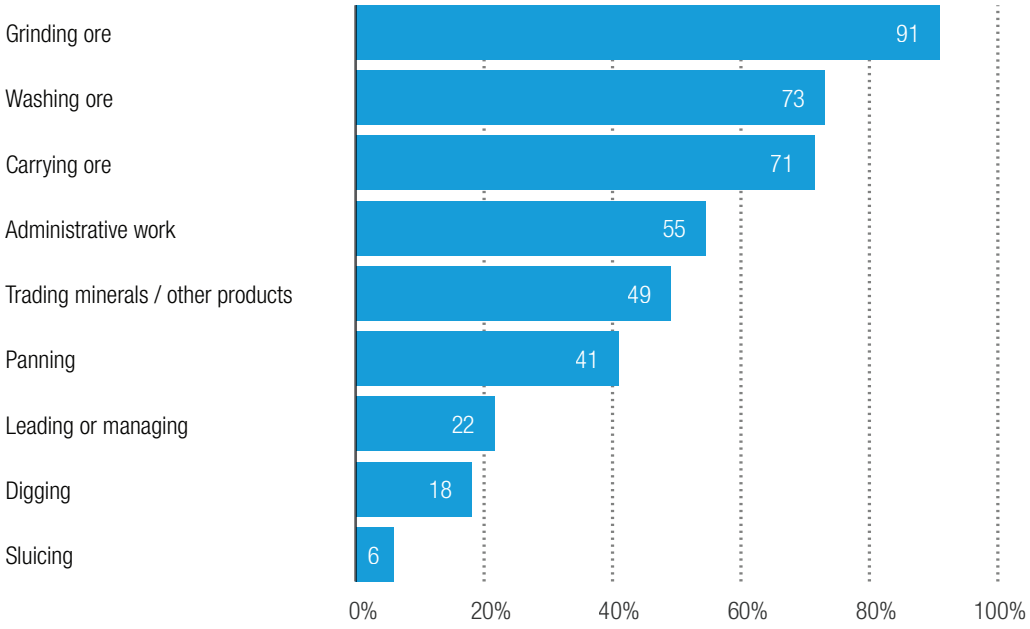
such as sluicing, digging, and positions of leadership (Figure 5).[14] The findings indicate that women are predominantly engaged in tasks such as grinding, washing, and transporting ore, while they remain under-represented in roles such as sluicing, digging, and positions of leadership (Figure 5). The survey also finds that 90 per cent of women had never received training on mining, safety, or mining (ISID, 2017).

As far as women's participation in LSM in the Democratic Republic of the Congo is concerned, estimates suggest that women make up 10 per cent of the workforce in the industrial segment (World Bank, 2017). Women's participation in the industry reflects broader patterns of underrepresentation in science, technology, engineering, and mathematics (STEM) professions overall, with women constituting less than 15 per cent of engineering and technology researchers in some West and Central African countries (UNESCO, 2024). This highlights the low number of female graduates in disciplines aligned with the technical demands of the sector. Relevant initiatives have been launched to address this skills mismatch—which has constrained access to technical and better-paid positions for Congolese workers overall (UNIDO, 2023). These efforts present a valuable entry point to strengthen women's participation in technical and vocational education and training, and to support their transition into more qualified and better-remunerated roles within the mining sector.

To improve women's participation in the sector, some LSM firms have developed

Figure 5

Shares of ASM roles in the Democratic Republic of the Congo, Rwanda and Uganda highlight female segmentation



Source: ISID, 2017.

Note: Based on a study of tin, tantalum, tungsten, and gold ASM sites in the Democratic Republic of the Congo, Rwanda, and Uganda.

[14] The value chains of tin, tantalum, tungsten, and gold share similarities with those of other critical minerals such as cobalt and copper, particularly in their significant reliance on artisanal and small-scale mining. Therefore, findings from the ISID survey may be used to draw inferences about certain aspects of ASM cobalt mining in the Democratic Republic of the Congo, including with respect to women's role in it (IGF, 2024b; ISID, 2017).

gender equality programmes linked to corporate social responsibility or in alignment to human rights and labour standards, yet more granular data and analysis on gender issues in large-scale mining in the Democratic Republic of the Congo remain limited (Pugliese, 2021).

Female entrepreneurship in the artisanal and small-scale segment is limited, and made difficult by the significant fixed costs involved and gendered barriers in access to land and finance (ISID, 2017; IGF, 2024b). Women are also less likely to participate in cooperatives or other networks offering access to geological, technical, and market information – resources that are essential for entrepreneurial activity in the mining sector. This limited participation is further compounded by the fact that improved regulation of ASM, while well-intentioned, can unintentionally exclude women. Due to structural barriers, women often face greater challenges in obtaining mining licenses and participating in decision-making processes within miners' associations or cooperatives (IGF, 2018).

Women working in cobalt mining are particularly exposed to health and safety risks. As per a survey conducted by Women's International League for Peace and Freedom in three artisanal mines in the Democratic Republic of the Congo, 73.8 per cent of female miners acknowledged that sexual violence and mistreatment were often a concern on mining sites (World Bank, 2015; WILPH, 2016).[15] Women may also be exposed to health risks because of gendered divisions in tasks. For example, stone sorting and washing tasks commonly performed by women – without proper personal protective equipment (PPE) exposes workers to skin diseases and infections from exposure to heavy metals (World Bank, 2023). The use of PPE among artisanal cobalt miners in the Democratic Republic of the Congo remains rare and largely limited to pilot initiatives. Larger-scale mining operations generally have greater capacity to implement appropriate safety measures (RCS Global Group, 2021). Yet, PPE is often not designed with women in mind, which compromises the safety of female workers and increases their risk of accidents and health-related hazards (RAID & Afrewatch, 2024).

Women's exposure to pollutants during pregnancy, combined with their responsibilities for childcare, means that employment in mining can have serious intergenerational consequences. In the absence of accessible childcare options, many women working in artisanal and small-scale mining bring their children to the mining sites, where they are exposed to hazardous conditions and significant health and safety risks (Lukamba, n.d.; World Bank, 2023). Child labour is also closely linked to women's participation in the sector, as children often accompany their mothers to mining sites and become involved in the work themselves (Lawson, 2021). The impacts of mining extend beyond the immediate work sites: reproductive and other health issues have also been linked to water contamination caused by industrial cobalt mining in surrounding communities (RAID & Afrewatch, 2024).

Efforts to create a more equitable mining sector are often hindered by limited institutional capacity and resources. As a result, key risks—such as unsafe working conditions and gender-based exclusion—remain difficult to address in a fair and effective manner. Incomplete or poorly implemented formalization processes, as well as inadequate improvements in occupational health and safety, can inadvertently harm women's livelihoods. For instance, some companies have introduced policies that ban pregnant women from mining sites without providing alternative employment opportunities in less hazardous or more suitable roles (WEF, 2020; Bashwira et al., 2014; IGF, 2023a).

Women's under-representation in policy and decision-making further limits the

[15] WILPH, 2016. Available at: https://www.wilpf.org/wp-content/uploads/2016/10/WomenInArtisanalMinesIn-DRC_web.pdf.

development of inclusive solutions. In the Democratic Republic of the Congo, fewer than 1 per cent of government and policy decision-makers are women. This disparity extends to the mining sector, where women are largely absent from management and executive roles (World Bank, 2017). This contributes to limited gender mainstreaming in the sector, especially when critical mining regulations are developed and adopted without the input of women artisanal miners (ISID, 2017). As a consequence, women continue to be marginalized in a sector that is central to both national development and the global energy transition.

Women tend to be overrepresented among ancillary roles providing goods and services to miners. There is a risk that ASM formalization or LSM expansion displaces some forms of ancillary work

At the community level, women are also frequently excluded from the local management structures that govern ASM. These structures could serve as valuable platforms for women to raise concerns and advocate for their needs, but their limited participation restricts access to decision-making and key information. For example, although the Mining Code of the Democratic Republic of the Congo includes protections for women's rights in the workplace, awareness of these rights is uneven. While over 85 per cent of men appear to be aware of the Mining Code according to survey results, fewer than 40 per cent of women knew about it (ISID, 2017).

An expansion of economic activities around the mining sector may benefit women entrepreneurs who are not directly participating in the mining value chain but could provide ancillary services to it

2.2.2. Indirect impacts of cobalt sector growth on women

Beyond the direct impacts on women working in mining, there are also broader gendered effects that extend beyond the sector itself. Potential for employment and entrepreneurship expands with the additional income and migration inflows accompanying the expansion of mining activity. This potential creation of jobs and entrepreneurship opportunities for women beyond the cobalt value chain risks being offset by the displacement of other areas of economic activity by mining. Land becoming unsuitable or unavailable for farming because of pollution, the effects of deforestation, and land seizure can harm women due to their disproportionate reliance on agriculture for their livelihoods.

Ancillary activities are not directly involved in the mineral value chain but take place on ASM sites. Women tend to be overrepresented among many ancillary roles providing goods and services to miners for both productive uses and personal consumption, such as selling food, water or other provisions, or carrying firewood or water. It is unclear how a larger cobalt sector would affect these workers. Ancillary activities have not been carefully studied, and little information is available on this largely informal field of work (World Bank, 2020a). There is, however, a risk that ASM formalization or LSM expansion displaces some forms of ancillary work, which requires careful consideration (World Bank, 2009). More dynamic ancillary occupations such as services related to translation and interpretation, catering, logistics, repairing of uniforms may enable women's participation in high-skilled, high-value ancillary activities. Efforts in this direction remain limited.

The expansion of the mining sector contributes to drive overall demand in local communities through increased population and income levels, creating entrepreneurship opportunities within mining-linked value chains. As discussed above, while female entrepreneurship within ASM remains limited and constrained by structural barriers, an expansion of economic activities around the mining sector may benefit women entrepreneurs who are not directly participating in the mining value chain but could provide ancillary services to it (e.g. catering, logistics, uniform repairing, translation and interpretation services). This requires addressing the persisting barriers for women-led businesses related to lack of scale, poor market connection, and financial support.

Outside of mining communities, even women that do not migrate to mining areas may encounter new challenges and opportunities because of outmigration by members of their families and communities, including the opening up of new jobs and additional domestic responsibilities.

2.3. Policies, initiatives and programs for women in mining in the Democratic Republic of the Congo

2.3.1. Policy frameworks related to the mining sector

The Democratic Republic of the Congo has several policies at the national and international levels to regulate and manage the critical minerals sector in a sustainable manner. Table 1 presents a compilation of these policies, highlighting to which extent they consider gender considerations.

The ASM sector is governed by the Ministry of Mines at the national level[16] and by the Provincial Mining Division at the regional level.[17] The Assistance and Supervision Service for Artisanal and Small-Scale Mining (SAEMAPE)[18] provides technical support to artisanal miners and cooperatives at mining sites to help improve their working conditions, productivity, and formalization; however, it lacks the resources needed to fully deliver this support.

The General Cobalt Company (EGC - Entreprise Générale du Cobalt)[19] aims to formalize and regulate the artisanal cobalt mining sector and holds exclusive rights on the purchasing, processing and marketing of artisanal cobalt. This means artisanal miners are legally supposed to sell their cobalt only to EGC. To improve the social and environmental responsibility of ASM production, EGC introduced the Responsible Sourcing Standard in March 2021, including requirements related to child labour, health and safety standards, environmental protection and human rights compliance.[20] Failure to meet these standards is likely to exclude a significant part of the artisanal cobalt sector from the formal supply chain markets (IIED, 2021). Due to the stringent requirements, however, a large share of artisanal cobalt continues to flow through informal or semi-formal channels.

The 2002 Mining Law aimed to formalize ASM by creating Zones d'Exploitation Artisanale (ZEAs) and by requiring a carte d'exploitant artisanal to mine in designated areas. Formalization involves identifying and grouping all artisanal miners within cooperatives and allowing them to work only in ZEAs on concessions from large-scale mining projects. ZEAs for ASMs are designated only in areas where industrial exploitation is not feasible. Traceability schemes and certification form the core of the ASM formalization process in the Democratic Republic of the Congo.

While existing formalization schemes have taken a step forward, there remains significant potential to improve the situation of ASM workers. Most creuseurs (French for "diggers") still work in precarious conditions, lack financial security and are often forced to pay a premium to access mining sites despite having the required permits. The permits often prioritize industrial purposes, leaving aside artisanal miners as ASM can only take place in registered ZEAs organized as cooperatives. ASM workers without correct paper or identification for formal work are also excluded from resource extraction (Calvao et al., 2021).

[16] It creates Artisanal Exploitation Zones (ZEAs) and regulates the trade of artisanal minerals (e.g., registration of mining titles in the national database by the Mining Registry - CAMI).

[17] It is responsible for the daily management of the ASM sector (e.g., granting licenses to miners and mineral traders) as well as the delivery of technical services to artisanal miners at the local level.

[18] Service d'Assistance et d'Encadrement des Mines Artisanales et de Petit Échelle – formerly SAESSCAM

[19] The General Cobalt Company is a Subsidiary of Gecamines (Générale des Carrières et des Mines), a state-owned enterprise involved in industrial exploration, research, and production of mineral deposits including copper and cobalt.

[20] The requirements of the EGC Responsible Sourcing Standard are addressed to workers, cooperatives, EGC, and buyers. Cooperatives are responsible for preventing gender-based discrimination, harassment or violence and providing safe work for pregnant women at sites; and EGC needs to manage health and safety risks about sanitation facilities (taking due account of gender).

Table 1
Relevant policies on critical minerals

Policy	Jurisdiction	Overview	Gender-related aspects
Mining Code, 2018[21]	National	The main legal framework for the mining sector in the Democratic Republic of the Congo following its predecessors in 2002, 1982, 1981 and 1967 in the era of independent Congo. The Mining Code aims to boost government revenue and promote local development by requiring mining companies to allocate 0.3 per cent of their turnover to community projects, prioritize local hiring and procurement, and enhance worker protections. UNCTAD's interviews with the Initiative of Women Entrepreneurs for Sustainable Development (IFEDD) in April 2025 highlighted that mechanisms for implementing these provisions are currently ineffective.	Prevents pregnant women from engaging in the artisanal exploitation of mineral substances. There is evidence suggesting that breastfeeding women were also excluded from ASM activities (Bashwira et al, 2014) The Mining Code imposes penalties for human rights violations, including that of women's rights. The Constitution and the 2006 Sexual Violence Law provide the legal basis for protection against gender-based violence in the Democratic Republic of the Congo. However, there are still challenges with implementation (GIZ, 2020).
Ministerial Decree #18/042, 2018	National	Declaration of cobalt, germanium and colombo-tantalite as strategic mineral substances	
Ministerial Decree #19/15, 2019	National	Establishes a regulatory framework for the artisanal mining of strategic minerals, including cobalt. It also establishes a state-owned company, EGC (Entreprise Générale du Cobalt), holding exclusive rights on the purchasing, processing and marketing of artisanal cobalt in the Democratic Republic of the Congo.	
Africa Mining Vision (AMV), 2009	Regional	Leverages mineral resource endowments to industrialise and diversify African economies. It is implemented through national mining visions.	The AMV introduced general commitments toward gender equality. It remains unclear to what extent such commitments have been prioritized or operationalized in the Democratic Republic of the Congo.
Africa Green Minerals Strategy (AU), 2025	Regional	Building on the Africa Mining Vision, it is a blueprint for the strategic use of critical mineral resources, including cobalt towards industrialisation and becoming a player in rising green technologies.	It recalls the commitments of the Africa Mining Vision for a well-governed mining sector that is inclusive.
EITI Standard 2019	International	An international initiative on transparency in the extractive sector	The Democratic Republic of the Congo has been a member of EITI since 2019.

[21] The Code defines a strategic mineral as a "mineral substance that, depending on the current international economic landscape, in accordance with the vision of the government, displays a particular interest with regards to the geostrategic context and its criticality."

Policy	Jurisdiction	Overview	Gender-related aspects
The Democratic Republic of the Congo - EU Strategic Partnership on sustainable raw materials value chains, 2023	International	EU agreement towards securing strategic and critical raw materials in a sustainable manner	There is no reference to gender considerations.[22]
ILO No. 118 Convention on Equality of Treatment in Social Security in 1967, ILO No. 100 Convention on Equal Remuneration in 1969, and ILO No. 111 Convention on Discrimination in Employment and Occupation in 2001.	International	The Equality of Treatment Convention guarantees the equality of treatment of nationals and non-nationals in social security; the Discrimination Convention prevents discrimination based on sex, and the Equal Remuneration Convention provides for equal rates of remuneration for men and women for work of equal value.	The Democratic Republic of the Congo has ratified these Conventions. Nationally, any form of discrimination is prohibited by Articles 11 to 13, and gender equality is emphasized by Article 14 of the Constitution enacted in 2006.[23]
The United Nations Guiding Principles on Business and Human Rights (UNGPs)	International	The UNGPs are guidelines that call on States to prevent business-related human rights abuses in conflict-affected areas, including gender-based and sexual violence, and to support businesses in assessing and addressing these risks.	As of May 2025, the Democratic Republic of the Congo has neither adopted a National Actional Plan (NAP) on business and human rights nor included a dedicated chapter in its human rights NAPs.[24]
The OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas	International	It provides government-endorsed recommendations for companies to respect human rights and avoid contributing to conflict through their mineral or metal purchasing decisions and practices. The Guidance recognizes the problem of GBV in the extractive sector. The Voluntary Principles on Security and Human Rights, however, make no direct reference to gender or SGBV (Sexual and gender-based violence).	Recognizes the problem of SGBV in the extractive sector.

Source: Compiled by UNCTAD using the International Energy Agency Policies Database, ILO Database, and other sources.

[22] International Energy Agency Policies Database.

[23] The Constitution of the Democratic Republic of the Congo, 2005. Available at: https://constitutionnet.org/sites/default/files/DRC%20-%20Congo%20Constitution.pdf

[24] https://www.ohchr.org/en/special-procedures/wg-business/national-action-plans-business-and-human-rights

Moreover, artisanal miners consider cooperatives as another control mechanism imposed by the state on them since cooperative heads reportedly demand unofficial payments from miners as high as 20 per cent of their production (IIED, 2021)

Additionally, partnerships between large mining corporations and artisanal miners' cooperatives, often established to mitigate reputational risks, primarily rely on wageless ASM workers. ASM miners are paid by production output without a base salary or other social protection mechanisms for their work in large-scale industrial operations, which also increases miners' exposure to commodity price fluctuations (World Bank, 2024d; Calvao et al., 2021).

While formalization efforts can vary considerably across sites and over time, informal ASM continues to hinder the potential to raise government revenue and regulate sector activity, including labour and environmental standards (GIZ, 2023a). Box 3 presents an overview of the formalization process and the issues with it in the ASM sector of the Democratic Republic of the Congo.

As discussed, child labour is another major issue in the mining sector of the Democratic Republic of the Congo, and closely connected with women's participation in the sector. The Inter-Ministerial Commission to Tackle the Issue of Child Labour at Artisanal Mining Sites is responsible for monitoring the issue of Child Labour in artisanal mines (CISTEMA) through a national strategy[25] and an implementation plan.[26] Cobalt trading centres were reallocated to 20 kilometres away from downtown Kolwezi, and several trading houses in residential neighbourhoods were closed; this is to reduce the likelihood of children being drawn into mines. Cooperatives have been sensitized about no tolerance to child labour in artisanal mines (IIED, 2021)

Box 3
ASM formalization: risks and opportunities for women

A case study on the tin, tantalum, tungsten and gold (3TG) ore sector shows that formalization processes created opportunities, constraints and challenges for all actors, including women, in the ASM supply chain. Some women shifted to less paying jobs or were entirely excluded from the new supply chain resulting from the formalization processes due to both the challenges and limitations they face in accessing good positions and the gender stereotypes in mining. Other women formed their own cooperatives to take advantage of the new opportunities (Byemba, 2020).

The case of the 3TG sector has similar implications for the cobalt sector, suggesting that women are at a high risk of being marginalized as they don't have the means to formalize. Hence, any policy to support formalization efforts need to have a gender lens, for example by applying differentiated policies such as simplified formalization standards or lower tax rates for women-owned mining companies.

[25] Ministère des Mines, République Démocratique du Congo (2017) Stratégie nationale sectorielle de lutte contre le travail des enfants dans les mines artisanales et sur les sites miniers artisanaux en République Démocratique du Congo (2017–2025).

[26] Ministère des mines, République Démocratique du Congo (2019) Plan opérationnel de la stratégie nationale sectorielle de lutte contre les pires formes de travail des enfants dans les mines et sur les sites miniers artisanaux.

Besides national policies, there are regional and international policy frameworks and initiatives regarding the mining sector in the Democratic Republic of the Congo. As outlined in Chapter 1, the African Mining Vision explicitly calls for gender equality in resource governance.

In addition to these regional policy frameworks, several ongoing initiatives have the potential to advance inclusive value chain development in the mining sector of the Democratic Republic of the Congo, and could be instrumental in supporting women's successful participation. The Lobito Corridor connects the Democratic Republic of the Congo, Zambia and Angola, to international markets via the port of Lobito in the Atlantic Ocean.[27] By facilitating the export of minerals, including critical minerals and strategic raw materials as well as agricultural products and other goods, it creates trade and employment opportunities that could benefit women, particularly as workers and MSME owners. Such opportunities could materialize for female-led enterprises through easier access to formal markets, public procurement opportunities, increased safety due to improved transport infrastructure, and enhanced border operations through harmonized customs procedures. Another regional initiative towards value chain development and value addition in cobalt sector is the Zambia - Democratic Republic of the Congo Cooperation Agreement establishing a value chain in the electric battery and clean energy sector.[28] Even though it is still in early stages, the initiative could be instrumental in supporting women's successful participation in the mining and clean energy sector in the Democratic Republic of the Congo, provided that gender considerations are embedded in its implementation.

Several non-governmental and private initiatives play a role in supporting fair working conditions and practices as well as gender equality in the mining sector of the Democratic Republic of the Congo. A non-exhaustive list is available in Annex I.

[27] The Lobito corridor is composed of 1,300 km of railway line from the port of Lobito to Luau on Angola's northeastern border with the Democratic Republic of the Congo and the North-Western Province of Zambia. The Benguela Railway, which was built between 1902 and 1931, forms most of the underlying infrastructure of the Lobito corridor (UNDP, 2024).

[28] https://www.parliament.gov.zm/sites/default/files/images/publication_docs/Ministerial%20Statement%20-%20On%20Zambia-Congo%20DR%20Joint%20Initiative%20on%20Electric%20Battery.pdf

Box 4
Legal framework related to gender equality and women's empowerment

The Democratic Republic of the Congo has an overall score of 78.8 out of 100 in the World Bank's Women, Business, and the Law 2024 Index. The country performs well on some legal indicators related to mobility, workplace, and entrepreneurship, but gaps remain in areas such as property, marriage, and pay (World Bank, 2024a).

Equal property and land ownership rights are critical to support women's capacity to benefit from ASM fully. Despite statutory protections in the Democratic Republic of the Congo, widows face major barriers to accessing land after a spouse's death (World Bank, 2023).

As shown in Table 1, the Democratic Republic of the Congo has ratified key ILO conventions on equal treatment, pay, and non-discrimination. Its 2006 Constitution also prohibits gender-based discrimination.[29] The Democratic Republic of the Congo is party to the Convention on the Elimination of All Forms of Discrimination against Women.

SGBV is a persistent issue, with the eastern region of the country reporting widespread abuse in ASM sites. Although legal frameworks exist—including the Mining Code and the 2006 Sexual Violence Law—implementation remains challenging. Misinterpretations of protective laws have resulted in the exclusion of pregnant and breastfeeding women from mine sites (Bashwira, et al., 2014).

The 2016 National Strategy for SME Development (SNPME) recognised SMEs as a driver of the economy and encouraged women entrepreneurs by promoting access to finance and business services and improving the business environment.[30] Measures include the launching of a National Financial Education Program to improve financial literacy, and committing to increase the financial inclusion rate to 65 per cent in 2028, from 38.5 per cent in 2023, with a focus on rural MSMEs and women.

[29] The Constitution of the Democratic Republic of the Congo, 2005. Available at: https://constitutionnet.org/sites/default/files/DRC%20-%20Congo%20Constitution.pdf

[30] Strategie Nationale de Developpement des Petites et Moyennes Enterprises (SNPME) 2016 . IC/UNCDF/345 Int/2015. SNPME. Available at: file:///C:/Users/tacardon/Downloads/STRATEGIE%20NATIONALE%20PME%20%20(1).pdf

3

Women and the nickel sector in Indonesia

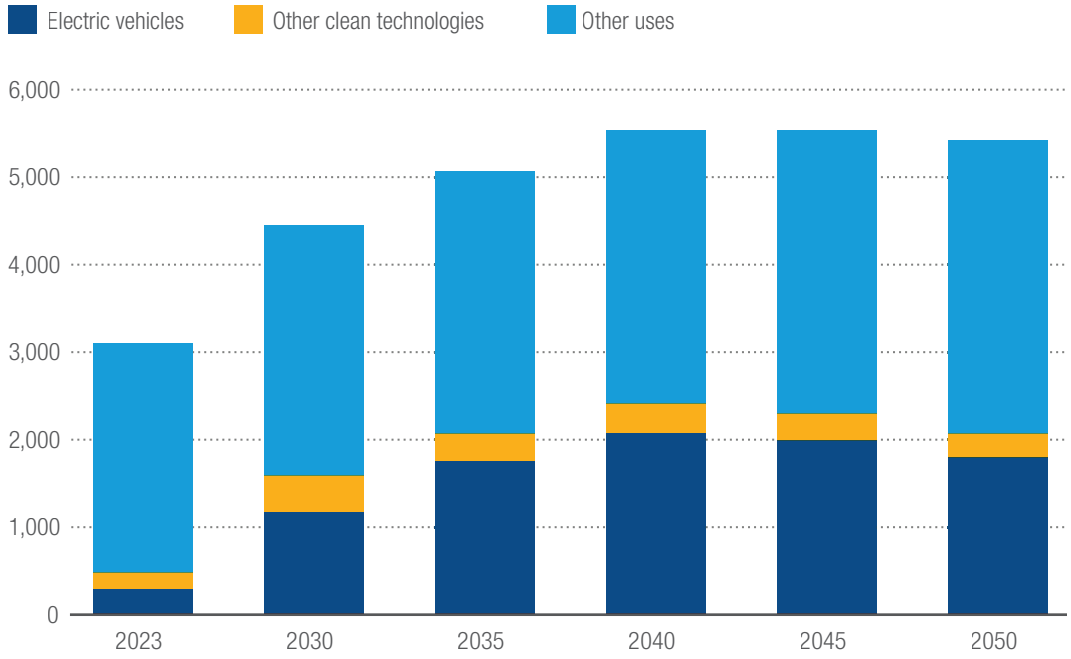
3. Women and the nickel sector in Indonesia

3.1. Nickel sector profile

Global demand for nickel is expected to grow significantly in the coming decades because of its increasing use in renewable energy production and storage, including in lithium-ion batteries, in the construction of wind turbines and solar panels, and as a catalyst in the production of green hydrogen. Demand from electric vehicles is forecast to grow from 62 kilotonnes in 2023 to 216 kilotonnes in 2050 (Figure 6).

A significant portion of the expected nickel demand will likely be met by Indonesia and Australia, as they hold the world's largest and second-largest reserves respectively (U.S. Geological Survey, 2024). According to estimates from the Ministry of Energy and Mineral Resources, Indonesia's nickel-metal reserves represent 40 per cent of the global total (MEMR, 2021). The largest of these reserves are in Sulawesi, one of the country's largest and most populous islands. Indonesia is

Figure 6
Forecast demand for nickel is expected to grow, 2023-2050
Kilotonnes



Source: IEA.

Note: Other clean technologies include solar PV, wind, other low emissions power generation, grid battery storage, and hydrogen technologies.

The development of battery manufacturing capabilities may offer new opportunities to absorb female workforce in high-value and high-skilled roles further down in the value chain beyond extractive activities

increasingly becoming the centre of global nickel production and trade and accounted for 81.2 per cent of global exports of ferro-nickel alloys in 2023 (Figure 7).

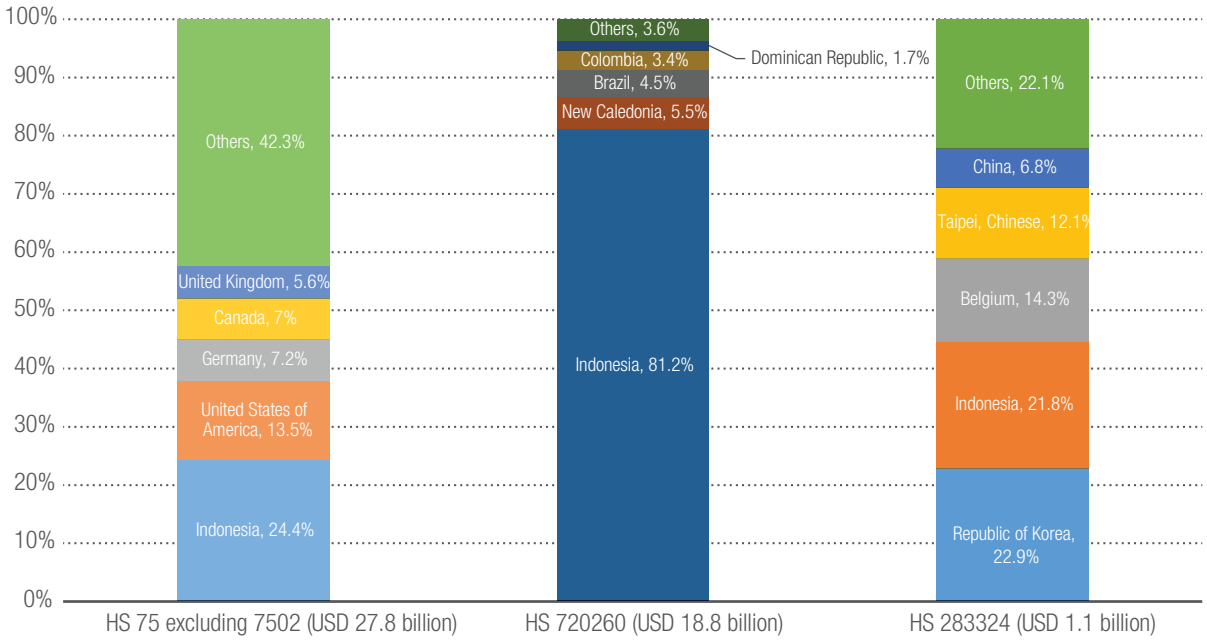
The government is fostering the development of the downstream sector and its processing and manufacturing capacities through trade policy and complementary initiatives. Historically, the lower-grade laterite ores primarily mined in Indonesia were mostly used in the production of stainless steel and were exported without processing in the country. Since January 2020, the country has banned exports of unprocessed nickel ore, requiring foreign buyers to invest in local smelters. This measure is part of a broader strategy that includes fiscal incentives, investment promotion, and streamlined procedures to support value-added processing (UNCTAD, 2024). Between 2019 and 2022, investment in Indonesian CETM processing and manufacturing increased from US$ 3.6 billion to US$11.0 billion according to available data from the Indonesia Investment Coordinating Board (Baskaran, 2024). Chinese foreign direct investment inflows have largely supported the recent expansion of the downstream sector (IGF, 2024c; Guberman et al., 2024).

Expanded investment in new processing technologies has increased domestic value addition and allowed the production of higher-quality nickel matte to be used in the manufacturing of electric vehicle batteries. While Indonesia's exports of lithium-ion batteries were very small in 2023, totalling just US$16.0 million, this increased to US$ 596.5 million in 2024, in current prices (ITC, n.d.). According to estimates, Indonesia has the potential to supply a large share of global demand for electric vehicle batteries, potentially boosting GDP and expanding employment opportunities

Figure 7

Indonesia is one of the largest exporters of selected processed nickel products, 2023

Percentage of global exports



Source: Trade Map.

Note: Total global export value is given in brackets. HS 283324 includes nickel sulphates; HS 720260 includes ferro-nickel alloys; HS 75 includes nickel and articles thereof; and HS 7502 includes raw nickel. Following an export ban on unprocessed nickel, Indonesia accounts for just 0.3 per cent of global exports of raw nickel products.

(UN Partnership for Action on Green Economy, 2024; Suherman et al., 2021). This expansion may offer new opportunities to absorb female workforce in high-value and high-skilled roles further down in the value chain beyond extractive activities.

Artisanal and small-scale mining has a limited role in nickel production since laterite ore commonly found in Indonesia is often located in large deposits, favouring large-scale mining operations (Fan et al., 2024). ASM nickel mining still takes place, including on concessions of large-scale mines (LSMs).[31] The export ban has had adverse effects on artisanal nickel miners, who have faced declining prices for their output and have been displaced to less productive areas (Camba, 2024). For example, following the implementation of the 2014 mineral export ban, many of the new jobs that had been created as a result of the nickel boom were suspended (UNCTAD, 2017b).

3.2. Women in nickel mining

Growing demand for nickel and the development of the related processing and manufacturing value chain have the potential to create new opportunities for Indonesian women. Gender gaps in economic participation can be large in Indonesia (Box 5). Skill development, improved access to finance, and renewed efforts at inclusive governance and leadership are needed to realize the full potential offered by the sector's growth.

3.2.1. Women's participation in the nickel value chain

More than 90 per cent of workers in Indonesia's metal ore mining sector are men, whereas they account for 60.8 per cent of employment across all sectors of the economy.[32] Indonesian mining has become more labour intensive in recent decades.[33] While this increase has mostly come from the formal sector, more jobs are created for men; the elasticity of male employment exceeds that of female employment in mining and quarrying (World Bank, 2016). Gender mainstreaming is required at all stages of national development planning and implementation and across economic sectors, including mining.[34] However, persisting gender biases may often hinder women's equitable participation (World Bank, 2022). As shown in Figure 9, unlike in the Democratic Republic of the Congo, where women are more active in ASM, women only account for about 10 per cent of ASM employment in Indonesia, a share that reflects their limited participation across the mining sector more broadly (DELVE, n.d;.World Bank, 2020b).

[31] While data specific to ASM in nickel value chain is not available, artisanal and small-scale mining is a significant contributor to other mineral sectors in the country, and is thought to employ a total of about 3.6 million people in Indonesia (DELVE, n.d.).

[32] Some studies raise concerns that the number of ASM workers is significantly under counted, with the actual number potentially more than double that given by Badan Pusat Statistik (BPS), the national statistics agency. This discrepancy may be the result of unregistered ASM or unstable and seasonal variation in mining employment (DELVE, n.d.).

[33] The employment elasticity of mining and quarrying – the growth in employment associated with a one percent increase in output – showed one of the biggest increases of any sector between 1993-2006 (excluding the Asian Financial Crisis period of 1997-99) and 2007-15.

[34] According to Presidential Instruction 9/2000 on Gender Mainstreaming in National Development, ministries and regional and provincial governments are required to implement gender mainstreaming in all steps of national development. Gender equality is also prioritized in Indonesia's National Medium-Term Development Plan 2020–2024 (UNCTAD, 2023d).

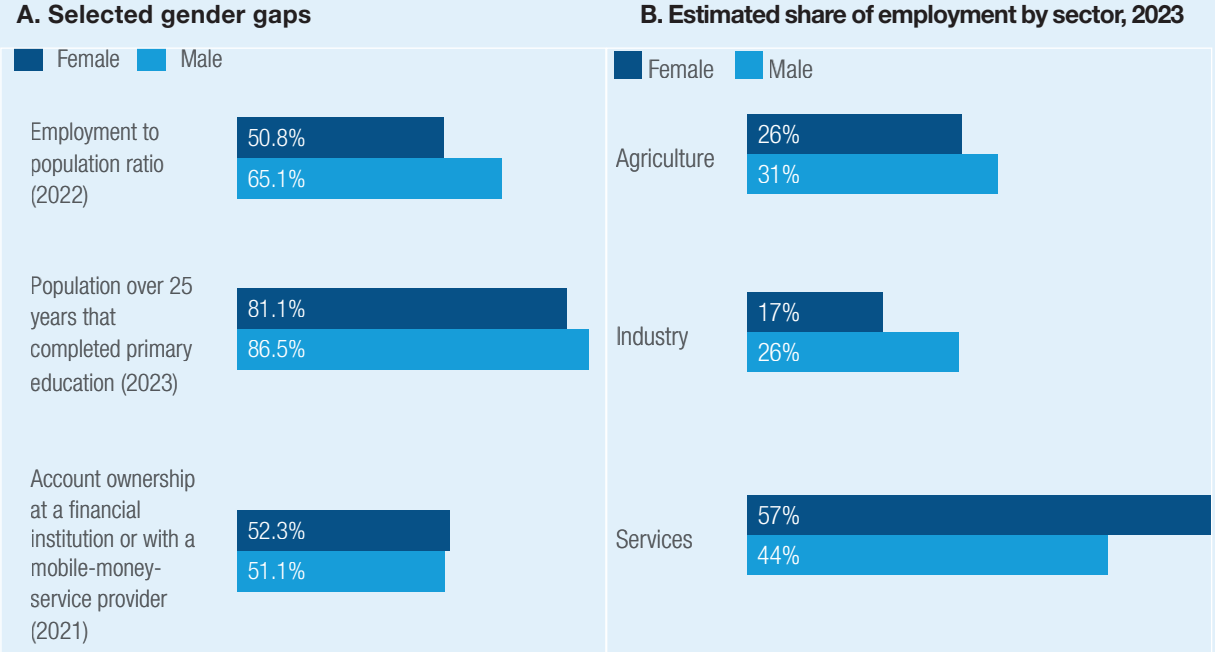
Box 5
Women's participation in the Indonesian economy: A snapshot

Gender gaps in employment can be large in Indonesia, though relatively good access to education and more stable work allow many women to participate in new economic opportunities. The female employment to population ratio is 52.6 per cent for 2024, significantly lower than the male ratio for the same year – 81.4 per cent (World Bank, n.d). Though, they appear to be balanced across the main sectors of the economy (Figure 8).

Female entrepreneurship rates exceed those of men in Indonesia for both early-stage entrepreneurial activity and established business ownership. In 2022/2023, 9.2 per cent of women started a business compared to 7 per cent of men, whereas 5.9 per cent of women, compared to 5.5 per cent of men, were owners of established businesses (GEM, 2023). Female-owned businesses are concentrated in textiles, food, apparel, and other labour-intensive sectors (Istiandari & Anandhika, 2018). Many female entrepreneurs are drawn to entrepreneurship as a way of balancing work with domestic responsibilities. As a result, these firms tend to be smaller. Gendered barriers to training and finance, legal and cultural constraints, and difficulties in accessing market information all hold back women business leaders. Nevertheless, some female entrepreneurs are very successful. Women-led businesses are overrepresented among the most innovative and export-oriented firms (UNCTAD, 2023c).

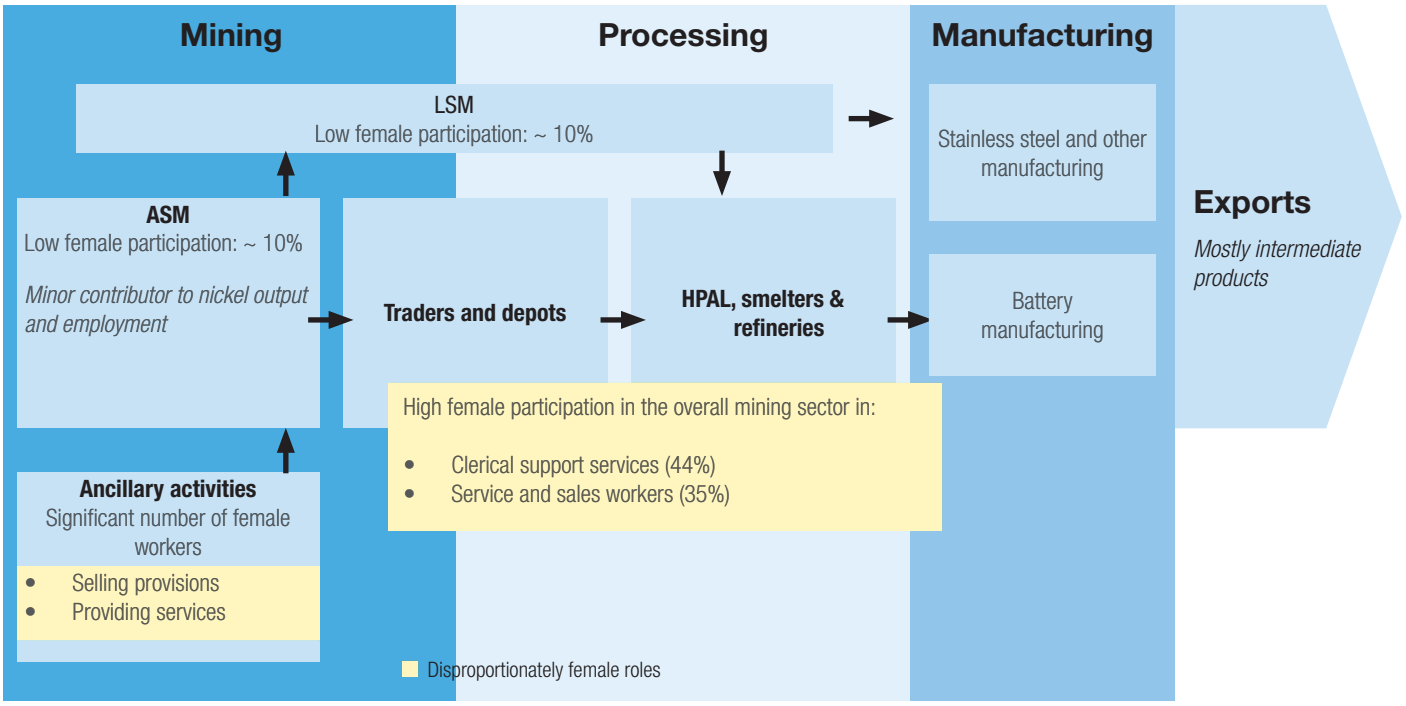
Education is relatively accessible to women in Indonesia; in 2023, 81.1 per cent of women aged 25 years and over had completed at least primary education, close to the male level of 86.6 per cent. Despite this, there is still room to address gender barriers; of the four key dimensions used in the Global Gender Gap Index (economic participation and opportunity, educational attainment, health and survival, and political empowerment), Indonesia ranks lowest on educational attainment (106 out of 146 countries) (WEF, 2023). In terms of access to finance, slightly more women than men owned an account with a financial institution or mobile money service. Indonesia is ranked 110 out of 162 countries in the GII (UN Women, n.d.-b).

Figure 8
Selected economic indicators in Indonesia show gender gaps



Source: World Bank, World Development Indicators.

Figure 9
Stylized mapping of employment by gender in the Indonesia nickel value chain



Source: UNCTAD.

Note: "Disproportionately female roles" refers to occupations in which women tend to be overrepresented, relative to the whole sector, which is significantly male-dominated. As such, most of these roles are not necessarily filled by women.

Women working in the sector tend to be overrepresented in non-production work and in roles with less earning potential. As shown in Figure 10, they are found in clerical support or service and sales roles, while very few are represented in management roles. Women working in the sector are more likely than men to have less than basic education or advanced education levels, as described in the figure, whereas most of them have at least basic education levels. As a result, women earn less than men in the mining and quarrying sector, with an average salary of just 83.2 per cent that of men in 2019 according to the Central Statistics Agency (Sudaryat et al., 2024).

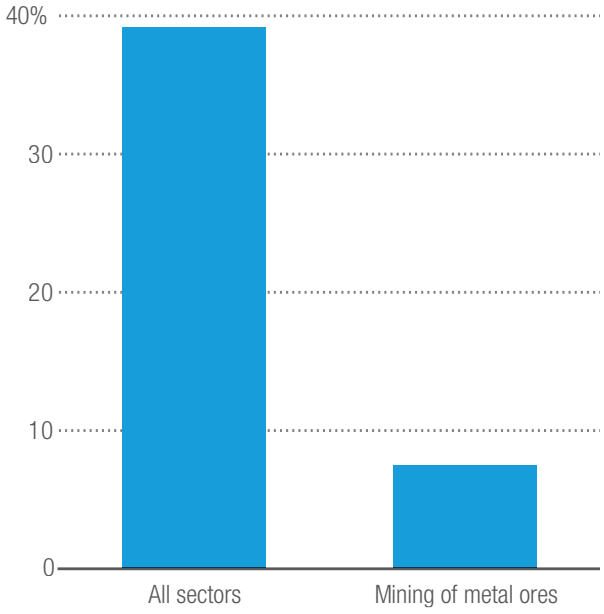
A study on the nickel value chain in Morowali Regency highlights a phenomenon of "feminization of labour" in the nickel processing industry, where women are increasingly hired into low-skilled, lower-paying, and often higher-risk roles. This trend appears to be driven, in part, by companies aiming to project an image of promoting a more gender-balanced workforce. The analysis highlights that, in addition to traditional roles such as receptionist, secretary, or laboratory operator, women are also increasingly employed in positions emerging from technological changes—such as crane operator, control room operator, excavator operator, and dump truck operator—often without adequate protection or safety measures in place (Zulaika & Labiro, 2025). Targeted efforts would enable women's access to higher-value and high-skilled jobs requiring sector-specific training and education.

Women only account for about a tenth of employment in some of Indonesia's largest nickel firms, and they often fill more administrative and sometimes management roles, compared with work in production, as shown in Table 2. Leadership roles are still disproportionately male, however. Most Indonesian mining corporations have not taken significant steps to enhance gender equality in their board and management positions (Sudaryat et al., 2024).

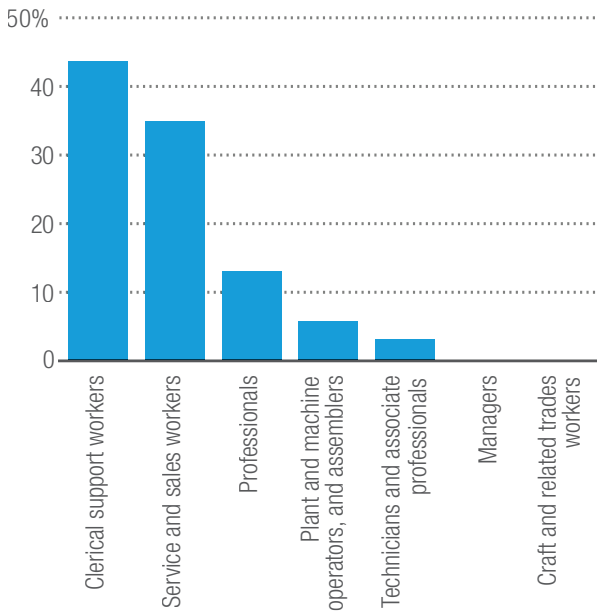
Figure 10

Large gender disparities persist in women's participation in the Indonesian mining sector, 2023

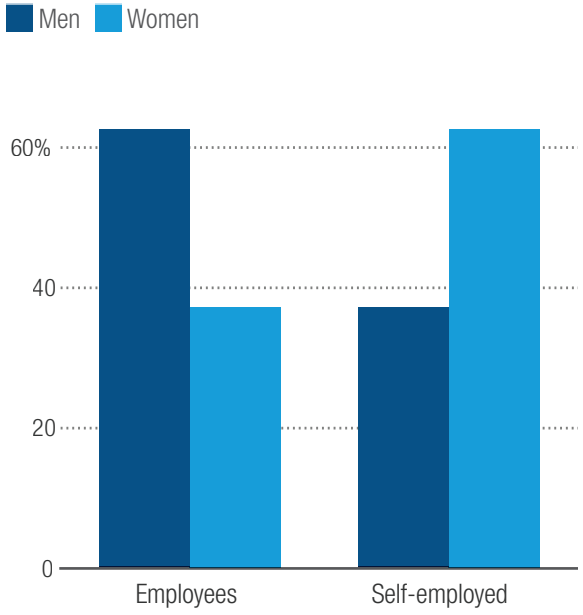
Share of women in total employment



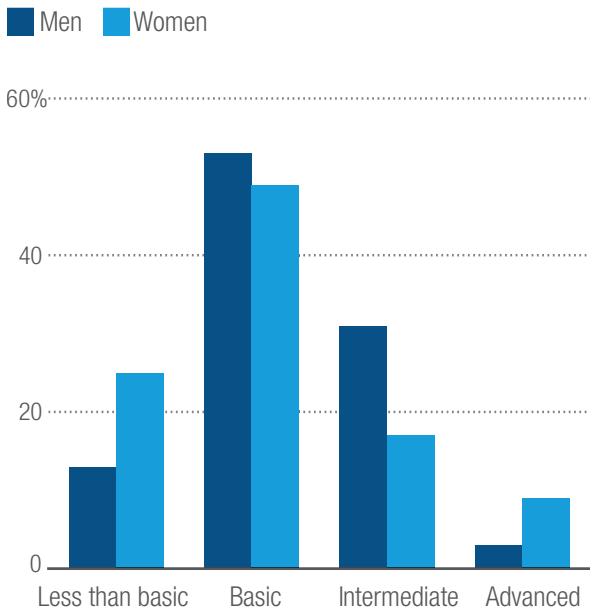
Women's shares of occupations in mining of metal ores



Distribution of employment by status for men and women in mining of metal ores



Distribution of employment by education level for men and women in mining of metal ores



Source: ILO.

Table 2
Employment of women in selected nickel firms

Firm	Parent company	Sub-sector	Employment by gender
PT Aneka Tambang (Antam)	MIND ID	Gold and nickel mining	• Women accounted for 10.9 per cent of employment in 2023 • One of the ten members of the board of directors was female • Division (or unit or project), bureau, or department roles were 18.1 per cent female, while other roles were 7.0 per cent female
Merdeka Battery Materials (MBMA)	PT Merdeka Copper Gold Tbk	Nickel processing	• Women accounted for 11.1 per cent of employment (11.0 per cent of permanent employees and 11.7 per cent of contract employees) in 2023 • Women account for 11.4 per cent of managers, superintendents, and supervisors; 16.1 per cent of staff; and 9.7 per cent of non-staff
Trimegah Bangun Persada (TBP Harita)	Harita Group	Nickel mining	• Women accounted for 7.7 per cent of employment in 2023 • One of the six directors was female
PT Vale Indonesia (Vale)	Vale	Nickel mining and processing	• Women accounted for 8.7 per cent of employment (including 11.1 per cent of management roles) in 2022 • Among management and senior staff, 14.3 per cent were women, as were 13.0 per cent of staff and 4.8 per cent of non-staff

Source: UNCTAD compilation, using company reports.

In an interview conducted by UNCTAD with Women in Mining and Energy, Indonesia (WiME) in May 2025, it was mentioned that there are few technical roles deemed acceptable for women, and these often require being paired with male counterparts. According to WiME, multiple obstacles hinder women's entry and advancement in the mining sector, such as the remoteness of mining sites, the male-dominated culture and long, inflexible working hours. Technical roles rarely offer family support policies or female-targeted recruitment. Cultural and societal norms further deter women, reinforcing the perception that mining is "men's work." Nevertheless, a 2022 survey by WiME on women in STEM[35] found that 89.3 per cent of all respondents—87.4 per cent of whom were women—expressed interest in working in STEM-related fields, including mining. Motivating factors cited include higher salaries, more progressive corporate culture, and opportunities for skill development, among others. This may suggest that women's underrepresentation in these fields, even in countries with developed downstream segments, may be due to structural barriers hindering women's equal participation. Nevertheless, women's representation in STEM education remains low, with only 25 per cent of female tertiary graduates in Engineering being women (UNDP, 2024).

[35] Survey shared by Women in Mining and Energy, Indonesia, titled Survey Report – Women in STEM, 2022.

Women are less likely to be involved in physically demanding or dangerous mining activities, and those that are may not receive the protection they need to perform their roles safely. Personal protective equipment is often not suited to women's bodies, increasing risks involved in working in the field (World Bank, 2023). At ASM sites in particular, women are typically involved in basic processing, including crushing and washing ore, collecting waste rock, and collecting and packaging ore, though gender roles are not strictly defined and can vary by context (World Bank, 2020a).

The expansion of domestic value addition leveraging natural resource wealth will continue to create new jobs in battery production and other forms of manufacturing. Yet, women are also underrepresented in these sectors, and their shares of employment are below the national average in downstream manufacturing sectors such as basic metals (where women account for 5.2 per cent of employment) and machinery and equipment not elsewhere classified (where women account for 14.3 per cent of employment). Instead, women make up most of the employment in unrelated manufacturing sectors such as textiles and apparel (ILO, n.d.a).

Sector-wide, company-level, and grassroots initiatives are contributing to address discrimination and the structural barriers that limit women's involvement in these areas of the economy. While gender biases and sexual harassment continue to be issues across the mining sector, the larger firms in the sector have been active in establishing gender equality policies. Several major firms in nickel mining and processing target increased employment of women, including in management and leadership roles (Sudaryat e al., 2024). Women in Mining and Energy (WiME) is an example of a grassroots response to the limited involvement of women in leadership roles. It was founded in 2019 to mainstream gender in these sectors through partnerships with relevant stakeholders, dissemination of knowledge and best practices, education, and policy advocacy.

3.2.2. Indirect effects of nickel sector development on women in mining communities and beyond

Beyond the extractive sector itself, economic activities emerging in and around growing mining communities offer significant potential to create opportunities for women. Women in Indonesia have historically gained from mining booms mainly through growth in retail and services, rather than direct jobs in mining. Women tend to move into these roles from unpaid or informal work, including in agriculture (Aqeel, 2024). Women are more likely to be involved in ancillary work at ASM sites, though this is less relevant to the production of nickel than cobalt in the Democratic Republic of the Congo. Non-mining activities and ancillary work appear to be less important sources of employment at mining sites, at least in some studies (World Bank, 2020a).

Positive local indirect effects also include expanded entrepreneurship opportunities for women. Increases in income in nickel mining communities foster the development of new businesses outside of the mineral sector (Karsadi, 2023). Women are highly active in the Indonesian business sector and are more likely to be business owners when compared to both East Asia and the Pacific region and the rest of the world (World Bank Enterprise Surveys). Therefore, they are well positioned to benefit from the sector's expansion, both directly and indirectly. However, women entrepreneurs still face several challenges, and they are more likely than men to engage in entrepreneurship out of necessity rather than opportunity. This is reflected in ownership patterns, with women accounting for 42 per cent of microenterprises but only 30 per cent of small enterprises (UNCTAD 2023d).

In an interview conducted by UNCTAD with WiME in May 2025, it was highlighted that women participating in small-scale, service-oriented entrepreneurship in the mining sector, typically run catering businesses or restaurants serving the mining workforce. Some have also entered local

supply chains by providing uniforms or basic goods. However, high-value supply chain contracts and larger entrepreneurial opportunities remain dominated by men.

Opportunities beyond the mining sector tend to be accompanied by increased exposure to other challenges for women. The expansion of the mining sector may have a negative impact on other economic activities, particularly through the loss of land and environmental degradation. Women may also be particularly vulnerable to land seizures and have often been excluded from land compensation processes (Lahiri-Dutt & Mahy, 2007). A study on Morowali Regency finds that the expansion of the nickel industry has significantly transformed local livelihoods, especially for women. While it has brought new economic activity, it has also disrupted traditional sources of income—such as fishing and clam harvesting—and access to clean water, prompting many women to adapt by seeking alternative and often more vulnerable forms of employment (Zulaika & Labiro, 2025). For example, in some coastal areas, women have traditionally collected coral and crabs - species that live near the shore, and have been particularly impacted by pollution from nickel mining (Naryono, 2023). Women may also be particularly vulnerable to land seizures and have often been excluded from land compensation processes (Lahiri-Dutt & Mahy, 2007).

Migration is another channel through which mineral booms affect women outside of mining communities, who may experience a similar combination of opportunities and challenges as a result of men's migration to work in mining. Men in Indonesia have been more likely than women to move to districts experiencing mining booms (Aqeel, 2024). Women remaining in migrant sending communities may benefit from remittances, new job opportunities, and increased roles in family decision making that can improve the wellbeing and resilience of their households (Bargain et al., 2024). However, the left-behind family members of migrants may also face new vulnerabilities due to additional responsibilities and the irregular flow of remittances (IOM, 2019).

The expansion of the mining sector may have a negative impact on other economic activities, particularly through the loss of land and environmental degradation

3.3. Selected regulations, initiatives and programs for women in mining

3.3.1. Regulation frameworks related to the mining sector

Indonesia has several policies at the national and international levels to regulate and manage the critical minerals sector in a sustainable manner. Table 3 presents a compilation of key policies.

Indonesia's strategy to develop the downstream segments of its nickel value chain is based on key pillars including requiring mining company to increase the value added content of minerals[36]; promoting the establishment of domestic processing industries[37]; and enforcing an export prohibition of nickel ore as of 1 January 2020.[38] To encourage investment in downstream sectors – in areas such as electric vehicle battery production, the government offers tax incentives.

[36] Law No. 4/2009 as amended by Law No. 3/2020 on the Amendment to Law No. 4/2009 on Mineral and Coal Mining. LN RI 2009/No. 4, TLN No. 4959. Available at: https://www.delvedatabase.org/uploads/resources/Amendment-to-Law-Number-4-of-2009.pdf.

[37] Law No. 3/2014 on Industry. LN 2014/No. 4, TLN No. 5492. Available at: https://peraturan.bpk.go.id/Details/38572/uu-no-3-tahun-2014.

[38] Minister of Energy and Mineral Resources Regulation No. 11 of 2019 on Mineral and Coal Mining. The export ban on nickel ore was first introduced in 2014. Indonesia relaxed the ban in 2017 by allowing exports of ore with nickel content up to 1.7 percent. However, the export permits for low concentration nickel ore were set to expire as of 31 December 2019. In December 2022, the WTO ruled that there is a violation of the WTO rules by Indonesia's nickel raw export ban and domestic processing requirements and that the ban does not fall within the exemption category of policies for "imminent critical shortage of a product essential to Indonesia" (WTO, 2022). Indonesia has launched an appeal with the WTO, which is effectively on hold due to the Appellate Body's paralysis.

Table 3
Relevant policies on critical minerals

Policy	Jurisdiction	Overview	Gender-related aspects
Mining Law No. 3/2020 2020	National	The main legal framework for the mining sector in Indonesia amending its predecessor in 2009	According to World Bank (World Bank, 2023) Indonesia has a gender-blind mining code, with no consideration or acknowledgment of gender issues.
Energy Ministry Regulation No.10/2023 2023	National	Oversight of mining contracts, permits, workplans, budgets, and reports in Indonesia's mineral and coal mining sector, superseding the 2020 and 2021 ones	Absent
Energy Ministry Decree N0.373.k/MB.01/ MEM.B/2023 2023	National	Guidelines for the preparation, evaluation, and approval of work plans and budgets in mineral and coal mining activities	Absent
Energy Ministry Decree No.258.K/MB.01/ MEM.B/2023 2023	National	Guidelines for granting of mining territory through auction	Absent
Energy Ministry Decree No.77k/MB.01/ MEM.B/2022 2022	National	National Mineral and Coal policy on inventory, management, monitoring and evaluation	Absent
Energy Ministry Decree regarding National Planning on Mineral and Coal 2022-2027	National	A strategic plan aimed at overseeing the Management of National Mineral and Coal from 2022 to 2027	Absent
Energy Ministry Decree Regarding Classification of the Critical Minerals Lists 2023	National	Classification of nickel as a critical mineral together with 45 other minerals	Absent
ASEAN Minerals Cooperation Action Plan 2005	Regional	Aims at developing the minerals sector to be an engine for greater economic growth and social progress in the ASEAN region; enhancing trade and investment in the ASEAN minerals sector; and	Absent
		promoting environmentally sound and socially responsible mineral development practices.	

Policy	Jurisdiction	Overview	Gender-related aspects
Presidential Instruction no. 9 of 2000	National	The main policy and strategy introduced to reduce the gender gap and eliminate discrimination against women.	Addresses the integration of gender perspectives into national development. In this context, the government was involved in passing legislation, such as the 2003 labour law, about gender equality and ensuring an equal and secure work environment for all workers.[39]
National medium-term Development Plan for 2020–2024	National	It refers to the strategies and targets that will guide the Indonesia's development for the next five years	It includes gender equality as a priority, including gender mainstreaming in the ministries and other institutions.
Basic Agrarian Act No. 5 of 1960	National	Laws regarding access to land ownership and inheritance rights.	There is gender-neutral access to land ownership and inheritance rights. However, the de facto practice leads to limited property shares for female members of the family.
EITI Standard 2019	International	An international initiative on transparency in the extractive sector	At the international level, since 2019 Indonesia has been a member of the EITI Standard, which promotes transparency and accountability in the oil, gas, and mining sectors.
ILO Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187); Equal Remuneration Convention, 1951 (No. 100) and Discrimination (Employment and Occupation) Convention, 1958 (No. 111)	International	The Discrimination Convention prevents discrimination on the basis of sex, and the Equal Remuneration Convention provides for equal rates of remuneration for men and women for work of equal value.	Indonesia has ratified the Conventions.

Source: Compiled by UNCTAD using the International Energy Agency Policies Database, ILO Database, and other sources

[39] Indonesia. Law No. 13/2003 on Manpower. Available at: https://www.hcwpolicylab.org/wp-content/uploads/2024/03/2003_Indonesian_Labour-Law-Act-13-of-2003.pdf.

The downstreaming strategy has been criticized for the risks associated with trade retaliation, and environmental harms such as deforestation, water pollution, and greenhouse gas emissions (IMF, 2023; IUCN, 2024; IGF, 2024c). The centralized approach to the mining sector may limit the capacity of the government to monitor compliance with environmental standards in mining, especially in remote areas (Malik, 2024).

The 2007 Limited Liability Company Law mandates corporate social responsibility and community development in Indonesia in the sense that "companies doing business in the field of and/or in relation to natural resources must put into practice environmental and social responsibility".[40] Several mining companies in the nickel industry have been implementing gender mainstreaming measures as part of corporate social responsibility policies. These measures include providing equal access and opportunities to men and women in recruitment processes, and providing services to female employees (e.g., developing work clothes comfortable to women workers, building lactation rooms). Gender equality is also considered while developing capacity building and awareness raising measures. However, advancing gender equality through corporate social responsibility policies still requires significant progress.

Several initiatives contribute to promote fair working conditions as well as gender equality in the mining sector in Indonesia. A non-exhaustive list is available in Annex I.

Box 6
Legal frameworks related to gender equality and women's empowerment

In terms of women's rights and gender equality, the 1945 constitution as well as the 1999 & 2000 human rights laws introduce protections based on equality of individuals in economic and social life regardless of gender. Presidential instruction no. 9 of 2000 addresses the integration of gender perspectives into national development; and the national medium-term Development Plan for 2020–2024 incorporates gender mainstreaming.

Indonesia has legislation (e.g. the 2003 labour law) about gender equality and ensuring an equal and secure work environment for all workers.[40] The country's national long-term development plan of 2005-2025 also includes the principle of gender equality.[41]

The Basic Agrarian Act No. 5 of 1960 maintains gender-neutral access to land ownership and inheritance rights, the de facto practice is different on the ground leading to limited property shares for female members of the family. Customary practices are influential even in countries with gender sensitive land laws. (World Bank, 2023). Equal access to land and property is essential for women's meaningful participation in ASM, as lack of land tenure limits their income, access to credit, and ability to invest in mining activities.

In terms of female entrepreneurship, the Presidential Regulation No 2/2022 supports policies targeting women-owned businesses (UNCTAD, 2023d). Other policy frameworks such as the Guidelines for Women's Entrepreneurship and the Indonesia Procurement Modernisation Project contribute to support women-owned businesses (OECD, 2018).

Indonesia has an overall score of 70.6 out of 100 in the World Bank's Women, Business, and the Law 2024 Index. The country performs well on mobility and workplace laws but still faces legal gaps in pay, entrepreneurship, pensions, inheritance, and family rights that limit full gender equality (World Bank, 2024b).

[40] Article 74. Law No. 40/2007 Concerning Limited Liability Company. Available at: https://cdn.indonesia-investments.com/documents/Company-Law-Indonesia-Law-No.-40-of-2007-on-Limited-Liability-Companies-Indonesia-Investments.pdf.

[41] Law No. 13/2003 on Manpower. Available at: https://www.hcwpolicylab.org/wp-content/uploads/2024/03/2003_Indonesian_Labour-Law-Act-13-of-2003.pdf.

[42] Law No. 17 /2007 on Long-Term National Development Plan of 2005-2025. Available at: ins202491eng.pdf.

4

Key insights from the case studies of the Democratic Republic of the Congo and Indonesia

4. Key insights from the case studies of the Democratic Republic of the Congo and Indonesia

As highlighted in the analysis, the expansion in demand for critical energy transition minerals has not yet resulted in broad improvements for women's economic participation in the Democratic Republic of the Congo and Indonesia, and this presents a valuable opportunity to foster more inclusive growth going forward.

Due to its dominant cobalt reserves, the Democratic Republic of the Congo is uniquely positioned to benefit from the anticipated growth of global demand in coming decades. This has the potential to create much-needed jobs in a low-income country and to expand government revenues. And yet, the country's cobalt value chain remains at an early stage of domestic value addition with limited downstream activities and limited opportunities of new employment generation.

Women continue to be concentrated in artisanal and small-scale mining and other vulnerable forms of work, with no clear evidence that they are benefiting from the sector's growth. Despite rising global demand, women's working conditions and opportunities remain largely unchanged. To advance economic potential will require fostering domestic value addition and inclusive and sustainable sector development. Institutional strengthening will be critical in improving the effectiveness of interventions across the value chain and beyond.

In Indonesia, sector development leveraging the country's mineral wealth is creating new economic opportunities. Backed by growing demand, the country is becoming a major producer of nickel and downstream products – including stainless steel and, increasingly, batteries for electric vehicles – thanks to the expanded exploitation of its large reserves and policies fostering investment in processing capacities. This has led to the creation of quality jobs in industrial mines and processing facilities, while the growth of downstream segments holds significant potential to open greater opportunities for women. However, despite the mining sector featuring a more developed value chain, there is also limited indication that women are gaining more or better opportunities as a result.

Persistent gender gaps continue to influence women's economic participation, limiting their access to the potential benefits of the CETM boom. The study highlights the importance of adopting comprehensive and proactive solutions to address these barriers, so that women can more equitably participate in and benefit from the sector's growth and transformation.

The analysis of the experiences of the Democratic Republic of the Congo and Indonesia can be summarized as follows:

Women's participation in the sector: Artisanal and small-scale mining is common in the Democratic Republic of the Congo's cobalt sector. The factors contributing to this include the accessibility of cobalt, which can be mined using basic tools and manual

labour. In Indonesia, on the other hand, nickel extraction requires large-scale and more complex methods that are not suitable for artisanal and small-scale mining. In both the Democratic Republic of the Congo and Indonesia, women tend to be concentrated in lower-paid roles in the sector. In both cases, rising demand could likely benefit women working outside of these value chains, particularly those in ASM or ancillary work in the Democratic Republic of the Congo, or in unrelated sectors benefitting from increased demand associated with income growth in Indonesia. The potential of women's integration into more technical roles requiring specialized skills that could be acquired through (vocational) training or increased participation in STEM education merits further attention and analysis. Occupations with potential to absorb female workforce may include geological surveying, civil and mining engineering, data analysis, infrastructure development, planning and project management, logistics, and renewable energy roles, among others.

Working conditions: Women workers in the sector studied tend to be exposed to poor working conditions. Differences in this regard are notable between small- and large-scale mining, with work in the former often being less stable and more dangerous. Work in ASM often exposes women to health and safety risks that are often gender specific and impact negatively their reproductive roles (World Bank, 2023; ILO, 2021). Women may be exposed to gender-based harassment and violence. Weaker legal protections and enforcement capacities can further increase the risks faced by women working in this sector. While it is important to make high-risk roles safer by ensuring decent working conditions for women, the analysis also highlights the value of supporting women's access to less hazardous roles. These roles often require specialized skills but offer better working conditions, higher pay, and are generally more appealing.

Informality: Some efforts have been made in formalising artisanal and small-scale mining in both countries, which can carry additional risks, depending on how these efforts are designed and implemented. Formalisation measures such as controlling site access or improving compliance with health and safety standards can improve working conditions and provide a basis for addressing gendered challenges in ASM work, particularly when supported by awareness-raising measures (Baumann-Pauly, 2023). However, formalization efforts also risk to unintentionally displace women to less paying jobs or entirely exclude them from the value chain.

Public governance: Policies and institutional capacities play a fundamental role in shaping how CETM- rich countries stand to benefit from increasing demand, and how gender sensitive approaches are designed and implemented in mining sector development. Policies related to the mining sector have yet to integrate gender perspectives to adequately address participation gaps and gender-specific vulnerabilities. Where women's representation in national and local government structures and cooperatives remains limited, the possibilities of influencing how policies and initiatives are shaped remains challenging. While civil society organisations representing women in mining provide some representation for these workers' unique interests and concerns, there is potential to better support such organisations and integrate them into mining-related consultations.

Corporate governance: Despite their low shares of female employment, larger, formal, and multinational firms in the sector with greater capacities and interests in their public image are often likely to state their commitment to gender equality, with many also implementing gender-sensitive policies. Corporate initiatives may include targeted skill development, transparent reporting on work and pay, and strengthened responses to workplace discrimination and harassment, among others (IGF, 2025). The private sector's efforts to improve women's participation and gender equality practices could be more effective if supported by stronger and clearer government policies and regulations.

Entrepreneurship. Entrepreneurship offers critical entry points for women, particularly in the provision of services that cater to the mining sector. There is a strong potential for women to benefit from emerging entrepreneurship opportunities, particularly in providing ancillary services within and around mining communities. This is particularly the case in Indonesia, which displays stronger female entrepreneurship rates. The existing policies and strategies related to female entrepreneurship in both countries offer important frameworks to support business growth and improve access to finance and economic opportunities. These could serve as a basis to enable female entrepreneurship in high-value ancillary services requiring specialized skills.

Broader social and environmental impacts. Many of the social and environmental challenges common to mining and processing pose threats to local communities and beyond. Cobalt and nickel mining, as well as smelting, and further downstream activities, create economic opportunities for many, but are also responsible for environmental degradation, negative social outcomes, and even the displacement of other areas of economic activity. Increasing global CETM demand also has gendered impacts outside of employment in mining value chains, due to the associated social and environmental changes. Insufficient enforcement of human rights and other protections on informal and remote mining sites increases the dangers present in this work for women. Limited regulations enforcement capacities is one of the significant factors contributing to gender-based violence and health and safety problems particularly in the ASM sector (World Bank, 2023).

5

Conclusions and final considerations

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The global demand for critical energy transition minerals presents immense opportunities for supplier countries to foster economic growth and sustainable development. A deliberate, gender-responsive approach is essential to ensure that the CETM boom contributes to both economic transformation and social and inclusivity goals.

Scaling up action in the following key areas will support countries in advancing gender-responsive value chain development:

1. *Gender-responsive approaches to the mining sector:* it is essential to integrate gender equality objectives explicitly into mining legislation, value chain development strategies, and critical minerals policy frameworks. Achieving this requires that women have a voice in leadership and decision-making across mining governance, cooperatives, and value chain efforts. This may include:
    - Aligning national strategies with regional and international commitments and standards on gender equality and responsible mineral development to ensure ownership and enforceability;
    - Establishing non-discriminatory employment practices and working conditions in the sector;
    - Creating gender units or focal points in key mining institutions, responsible for the oversight and monitoring of gender related goals in the sector
    - Improving institutional structures responsible to manage mandated social contributions from the revenues of mining companies to established development funds;
    - Requiring mandatory gender-impact assessments in mining project approvals, and promoting guidelines for downstream initiatives that systematically apply a gender lens;
    - Requiring gender-disaggregated data collection and reporting from all mining and processing firms;
    - Measuring the contribution of informal work to the mining sector to better capture the extent of women's participation into ASM and ancillary activities;
    - Promoting gender-responsive formalization initiatives for the ASM sector such as introducing simplified licensing and registration processes for women miners and women-led cooperatives, and reducing the barriers to both forming cooperatives and becoming members of them;

South Africa gender-sensitive mining policy

South Africa introduced quotas requiring 10 per cent of mining staff to be female by 2009. Currently, the Mining Charter, 2018 requires 30 per cent of women in senior management positions, and additional targets of 38 per cent in middle management and 44 per cent in junior management positions. The Mining Charter also requires companies to dedicate 5 per cent of annual payroll on skill development, especially for women and black people. Some of the successes as a result of these requirements include an increase in inclusive procurement, training and mentorship programs (IGF, 2025).

- Supporting women's organisations that are active in the sector and integrate them into mining-related consultations;
- Encouraging stronger representation of women in national and local government structures and cooperatives through quotas or dedicated targets.

2. *Creating opportunities in high-value roles through education and skills development:* Beyond improving women's situation in ASM, targeted efforts are needed to favour women's participation into LSM and downstream activities, which offer jobs with better work conditions and higher wages. It is critical to encourage access to targeted education, training, and capacity-building programs to prepare women for higher-value roles across the mining value chain. This may include:

- Promoting gender-inclusive training in STEM fields and vocational and technical training programs to encourage greater participation in technical roles within the LSM segment and downstream activities, in occupations such as such as geological surveying, civil and mining engineering, data analysis, infrastructure development, planning and project management, logistics, renewable energy roles, among others;
- Providing upskilling opportunities to women working in ASM or ancillary services, to enable them to transition into better paying roles, including those requiring specific technical skills;
- Encouraging LSM companies to establish mentorship programs for women.

Focusing on skills development for women in copper mining in the Democratic Republic of the Congo

A copper mine operating in the Lualaba Province of the Democratic Republic of the Congo, is addressing systemic barriers limiting women's access to mining jobs by strengthening the education of girls through initiatives such as the *Cadetship Program*, the *Mining Career Preparation Program*, and targeted educational support. 114 out of 228 local community members who were employed through this program were women, and 50 per cent of secondary school bursaries went to girls in 2023. The company also reserves entry level jobs for local community members, and 30 per cent of these hires have been women (IGF, 2025).

3. *Women's entrepreneurship:* A critical way in which the mining sector can support women's participation is by opening up entrepreneurship and employment opportunities through the use of local suppliers in both upstream and downstream segments. Areas with significant potential for women's enhanced participation include services related to translation and interpretation, catering, logistics, repairing of uniforms, and production of handicrafts intended for foreign workers, among others. This may include:
    - Linking up women-led MSMEs and suppliers to the mining sector by supporting growth and capacity-building;
    - Supporting women-led MSMEs in accessing procurement opportunities and other opportunities emerging from local content requirements;
    - Require a legally-binding minimum participation of women-led MSMEs in private and public procurement opportunities.
    - Integrating gender inclusion objectives into industrial and SEZ development plans (e.g., the Democratic Republic of the Congo - Zambia battery initiative).

Expanding entrepreneurship opportunities for women in the mining community

A Canadian company that operates a gold mine in Mauritania has set up the Tasiast Women's Cooperative in 2013, supporting enterprise development and entrepreneurship for women. 40 local women, some of which from vulnerable backgrounds, were trained on sewing, numeracy and literacy, and on fundamentals of business management. Through the initiative, women were able to participate in economic activities within the sector, generating income by providing sewing services such as repairing uniforms for the mine or creating products tailored to mining jobs such as masks. While initially the cooperative's work focused on orders from the mining sites, it was then able to expand to other local markets (IGF, 2025).

4. *Traditional livelihoods protection and restoration:* Governments and companies should implement measures to protect traditional livelihoods affected by land loss and environmental degradation, as this may impact women disproportionately. This may include:
    - Conducting livelihood impact assessments to identify and mitigate risks on local communities;
    - Facilitating access to alternative income-generating opportunities, particularly for women;
    - Ensuring environmental protection and rehabilitation of the ecosystems affected by mining operations that are essential for the subsistence of local communities;
    - Providing adequate support to women who transition into new sectors, including for instance training, access to markets, access to finance.

Recognizing traditional rights and compensating local communities in Australia

A In 2004, the traditional owners of the East Kimberley region of Western Australia, the Kimberley Land Council, and a private company entered into the registered agreement "The Argyle Diamond Mine Participation Agreement", which provided for financial and other benefits for the owners of the land. This included recognition of their traditional rights over the land, which the company would be leasing for mining operations, provision of training and employment of local Aboriginal people, rehabilitation plans for the land after the mines would be closed and protection of indigenous sites.[43] While there have been some challenges with the implementation of the Agreement, success factors include royalties being paid to the local community and employment opportunities being created.[44]

[43] Australian Human Rights Commission (2006). *Native Title Report*. https://humanrights.gov.au/our-work/aboriginal-and-torres-strait-islander-social-justice/publications/native-title-report-2006.

[44] Parmenter, J et al (2023). *Aboriginal employment outcomes at Argyle Diamond Mine: What constitutes success, and for whom?* Science Direct; Austin Ho Tung Tang (2023). https://www.sciencedirect.com/science/article/abs/pii/S0301420723010383. *Precious Land Stones Towards Enduring Social & Economic Frameworks for Remote Indigenous Communities, within the Australian Mining Industry. Royal Danish Academy.* https://kglakademi.dk/sites/default/files/node/field_downloads/Austin%20Tang_Written%20Thesis.pdf

5. *Further considerations for strengthening institutional capacity to advance a gender-sensitive mining sector:*

    - Providing technical assistance programs to better understand the impacts of value chain development and trade expansion on women's participation, and to better integrate gender considerations in mining policies and regulations;
    - Strengthening statistical capacities to collect and analyse gender-disaggregated data in mining value chains;
    - Fostering South-South dialogue and knowledge exchange to benefit from the experience of countries leading in gender-inclusive mining reforms.

To conclude, meeting the growing global demand for CETM shows promise to create new opportunities — both in the regions where these resources are extracted and, in the areas, where downstream activities develop. It also holds the potential to increase women's participation and improve their working conditions in a deeply male-dominated sector where women are often confined to limited roles and lower-paying positions. However, realizing this potential will require deliberate action to dismantle persisting gender gaps in the broader labour market while creating enabling environments for women's participation in the sector.

Annex. Other initiatives and programs on critical minerals

Table A.1
The Democratic Republic of the Congo: Other initiatives and programs on CETM

Programme	Parties involved	Overview	Gender-related aspects
Initiative for Responsible Mining Assurance (IRMA)	100 companies in 35 countries[45]	A multi-stakeholder organisation consulting on how best to address environmental and social issues in mining and evaluating social and environmental performance at mine sites globally	IRMA integrates requirements on gender equality and gender protections.
Responsible Minerals Initiative (RMI)	More than 500 companies and associations from over 30 industries	A multi-industry initiative of the Responsible Business Alliance (RBA) and the Global e-Sustainability Initiative focused on minerals supply chain due diligence, assisting companies in regulatory compliance,[46] organizing workshops and contributing to policy development	RMI carries out research on gender-security risks in the cobalt-producing regions, and developed the ASM Cobalt Normative Framework.
Responsible Cobalt Initiative (RCI)	More than 50 companies in the cobalt supply chain	A transnational extractives governance mechanism launched by the Chinese Chamber of Commerce for Metals, Minerals & Chemicals (CCCMC) Importers & Exporters, with the help of OECD to address social and environmental risks in the cobalt supply chain with child labour being a priority area.[47] It aims to have companies 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 for increased transparency and improved governance in the cobalt supply chain (CCCMC, 2016).	The OECD Due Diligence Guidance lists improving women's conditions in ASM communities through gender awareness and empowerment programs.
Fair Cobalt Alliance (FCA)		A multi-stakeholder action platform to mobilise resources across the cobalt supply chain to provide technical assistance and investment towards a formal, fair, and safe ASM cobalt sector in the Democratic Republic of the Congo.[48]	The Fair Cobalt Alliance (FCA) together with the RCI and the Cobalt Action Partnership (CAP) developed a draft ASM Cobalt Framework that may enable progressive improvements at artisanal cobalt mines in the Democratic Republic of the Congo.

[45] https://responsiblemining.net/wp-content/uploads/2024/11/IRMA-Mining-Engagement.pdf

[46] Independent third-party audit programs for smelters such as the Responsible Minerals Assurance Process (RMAP), Minerals Reporting Templates, supply chain risk assessment tools, Country of Origin data, and guidance documents on responsible sourcing of all minerals/metals: https://www.responsiblemineralsinitiative.org/media/docs/standards/RMI_RMAP%20ESG%20Standard%20for%20Mineral%20Supply%20Chains_June32021_FINAL.pdf

[47] https://respect.international/wp-content/uploads/2018/08/Responsible-Cobalt-Initiative-RCI.pdf

[48] https://www.faircobaltalliance.org/our-mission/

Programme	Parties involved	Overview	Gender-related aspects
International Conference on the Great Lakes Region (ICGLR)	The countries in the African Great Lakes Region[49]	An inter-governmental organisation that aims to build peace, political stability and development in the member states. The ICGLR Action Plan on Women, Peace and Security 2021-2024; Gender, Women and Children Program	The ICGLR adopted in 2022 the Guidelines on Mainstreaming Gender in the Minerals Sector. It suggests developing national strategies for mining and gender, and mainstreaming gender strategies in existing Mineral Sector policy and work plans (ICGLR, 2022).
Chamber of Mines (Chambre des Mines)*	Companies operating in the mining sector of the Democratic Republic of the Congo	The chamber supports mostly large-scale mining companies' interests, and contributes to the development of policies on mining activities.	N/A
National Network of Women in Mining (RENAFEM)*	Stakeholders in the Democratic Republic of the Congo	A national network of stakeholders working towards increased participation and protection of women in the mining sector of the Democratic Republic of the Congo.	RENAFEM focuses on gender equality issues and women's participation in the mining sector of the Democratic Republic of the Congo and works toward the dissemination of laws on women's participation and protection in the mining sector (Gerig et al., 2020).
Association of Women in Mining in Africa (AWIMA)	36 national mining organisations and associations	A regional association focusing on training, capacity building, sustainable mining practices, and advocacy to empower women and promoting women's economic participation in the extractives sector	AWIMA deals with enhancing women's participation in the extractive sectors regionwide and works towards eliminating Violence Against Women and Girls in the Mining Sector in Africa.[50]
Initiative of Women Entrepreneurs for Sustainable Development (IFEDD)		Local non-governmental organisation established in 2016 in Goma. IFEDD promotes the responsible management of natural resources taking into account both the development needs of local communities and environmental protection.	IFEDD supports women in the gold, copper, coltan and cobalt value chains. Its work includes providing support women's role in mining cooperatives trough formalization, awareness raising and capacity building.
General of the Mining Cooperatives of South Kivu (GÉCOMISKI)*	Cooperatives	An association of cooperatives in South Kivu, lobbying for the interests of artisanal miners and providing training and information on the principles and laws on artisanal mining in the Democratic Republic of the Congo.	N/A
Federation of Mining Cooperatives of Katanga (FECOMIKAT)*		An association of cooperatives active in the Haut-Katanga province in the 3Ts and Copper/Cobalt sectors	N/A

[49] The organization has twelve member states, namely: Angola, Burundi, Central African Republic, the Congo, Democratic Republic of the Congo, Kenya, Uganda, Rwanda, South Sudan, Sudan, the United Republic of Tanzania and Zambia. https://icglr.org/the-icglr/

[50] https://awimaafrica.com/case/evefminaf-project/

Table A.2
Indonesia: Other initiatives and programs on CETM

Programme	Parties involved	Overview	Gender-related aspects
Initiative for Responsible Mining Assurance (IRMA)	Includes 100 companies in 35 countries	A multi-stakeholder organization consulting on how best to address environmental and social issues in mining.[51] IRMA includes gender-related requirements to ensure companies prevent discrimination and harassment, support maternity and health needs, ensure gender-appropriate facilities and security measures, and implement gender-responsive grievance mechanisms and impact assessments.	IRMA integrates requirements on gender equality and gender protections, stressing that companies must not discriminate against women, provide maternity leave of no less than 14 weeks, address health and safety risks of pregnant or nursing women, provide gender appropriate facilities, incorporate women's needs into security risk assessment, prevent gender-based harassment and/or exploitation, assess gender equality as part the impacts related to ASM, develop gender-responsive grievance mechanisms.
WALHI (Indonesian Forum for Living Environment)	Includes more than 479 NGOs	The oldest and the largest environmental advocacy NGO in Indonesia.	WALHI identifies gender justice as one of its core values. They work on issues such as agrarian conflict over access to natural resources, indigenous rights and peasants, and focus on women across these issues.
JATAM (Mining Advocacy Network)	Network of non-governmental organisations (NGO) and community-based organisations (CBO)	They are working on issues on human rights, gender, the environment, indigenous people and social justice in the context of the mining, oil, and gas industries.	JATAM advocates for social justice, and people-s sovereignty over their territory and provides support for people impacted by mining and the expansion of the extractive industry. This includes providing support to women farmers to stop zinc mining at certain sites.
AEER (Action for People Ecology and Emancipation)		A non-profit organisation on the environment and energy focused on reducing emissions in Indonesia with a focus on coal retirement, climate and energy finance, energy democracy, transition minerals and public transport	AEER seeks to prioritize ecological justice for communities in Indonesia during the energy transition. They publish research on the growth of the nickel section, including its impact on local communities and the feminization of lowly paid female labour.
Trend Asia		A civil society organisation on energy transformation and sustainable development in Asia with a focus on the just energy transition, community welfare and intergenerational justice	Trend Asia publishes research, among others, on gender wage gap and discrimination in the nickel industry.
Women in Mining and Energy (WiME)		A civil society organisation whose goal is to advance gender equality in Indonesia's mining sector. Established by professionals with experience in mining, the organisation promotes equal opportunities for women in both formal and informal segments through advocacy, research, and a STEM mentorship programme.	WiME conducts forums for women in the mining sector to share their experiences about working in the sector, conduct mentorship programs for women STEM graduates and advocates for partnership across stakeholders to advance gender equality.

[51] https://responsiblemining.net/wp-content/uploads/2024/11/IRMA-Mining-Engagement.pdf

References

Abrahamsson L (2019). *Gender perspectives on the impact of technological change in mining*.

AMDC (n.d). *Burkina Faso ASM Profile*. AMDC.

Amnesty International & Initiative Bonne Gouvernance et Droits Humains (IBGDH) (2023). *Powering Change or Business as Usual? Forced evictions at industrial cobalt and copper mines in the Democratic Republic of the Congo.*

Aqeel A (2024). *"How Do Mining Booms Impact the Labor Market for Men and Women? Evidence from Indonesia*". Environment and Development Economics. 27(6).

Bargain O, Loper J and Ziparo R (2024). *Women's Empowerment and Husband's Migration: Evidence from Indonesia*. CERDI Working Papers. 2024/1.

Bashwira M R, Cuvelier J, Hilhorst D and van der Haar G (2014). "*Not only a man's world: Women's involvement in artisanal mining in eastern DRC*". Resources Policy. 40. pp. 109-116.

Baskaran A (2024). *Diversifying Investment in Indonesia's Mining Sector*. Center for Strategic and International Studies.

Batana Y M, Jarotschkin A, Konou A, Masaki T, Nakamura S and Vilpoux M E V (2021). *Demographic and Spatial Disparities in Labor Market Outcomes withing the Kinshasa Urban Landscape*. World Bank.

Baumann-Pauly D (2023). *Cobalt Mining in the Democratic Republic of the Congo: Addressing root causes of human rights abuses.* NYU Stern Center for Business and Human Rights.

Byemba G (2020). *Formalization of artisanal and small-scale mining in eastern Democratic Republic of the Congo: An opportunity for women in the new tin, tantalum, tungsten and gold (3TG) supply chain?.* The Extractive Industries and Society, 7(2), s. 420-427.

Camba A (2024). *The Political Economy of Indonesia's Nickel Mining Industry*. Strauss Center for International Security and Law.

Calvao F, Mcdonald C and Bolay M (2021). Cobalt mining and the corporate outsourcing of responsibility in the Democratic Republic of Congo. The Extractive Industries and Society.

CCCMC (2016). Responsible Cobalt Initiative (RCI).

Cobalt Institute (2024). *Cobalt Market Report 2023.* Cobalt Institute.

Comtrade (n.d.). *UN Comtrade Database*. United Nations.

DELVE (n.d.). *Indonesia*. Delve Database.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) (2023a). *Economic Implications of the Energy Transition on Government Revenue in Revenue-rich Countries*. GIZ.

ECLAC (2023). *Lithium extraction and industrialization: opportunities and challenges for Latin America and the Caribbean*. ECLAC.

Entreprise Générale Du Cobalt (EGC) (2021). *EGC Responsible Sourcing Standard*. https://www.trafigura.com/media/zy2jpesz/2021_trafigura_egc_responsible_sourcing_standards_en.pdf

EITI (2023). *EITI Standard 2023*. EITI

EITI (2024). *Rapport ITIE- 2022*. EITI

Fan Q, Yuan S, Wen J and He J (2024). "Review on comprehensive utilization of nickel laterite ore". Minerals Engineering. 218.

GEM (2023). 2022/2023 *Global Report: Adapting to a "New Normal"*. London. Global Entrepreneurship Monitor.

Gerig L, Ndagano P, Schneck N and Hoex L (2020). *Delve Country Profile: Democratic Republic of the Congo*. Delve.

GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) (2020). Sexual and Gender-Based Violence in the Mining Sector in Africa. Evidence and reflections from the DRC, South Africa, Tanzania & Uganda.

Guberman D E, Schreiber S and Perry A (2024). *Export Restrictions on Minerals and Metals: Indonesia's export ban of nickel*. United States International Trade Commission.

ICGLR (2022). *Guidelines for Mainstreaming Gender in the Mineral Sector*. ICGLR.

IEA (2023). *Energy Technology Perspectives 2023*. IEA.

IEA (2024). *Global Critical Minerals Outlook 2024*. IEA.

IGF (2018). *Women in Artisanal and Small-Scale Mining: Challenges and opportunities for greater participation*. IGF.

IGF (2022) *Global Review: Integrating gender into mining impact assessments*. IGF.

IGF (2023a). *Parental Leave Policies in the Mining Sector*. IGF.

IGF (2023b) *Women and the Mine of the Future: Global report*. International Institute for Sustainable Development. IGF.

IGF (2024a). *Navigating Global Sustainability Standards in the Mining Sector.* IGF.

IGF (2024b). *Artisanal and Small-Scale Mining of Critical Minerals.* IGF.

IGF (2024c). *Decarbonization of the Mining Sector: Case studies on the role of mining in nationally determined contributions in Chile, Indonesia, and South Africa*. IGF.

IGF (2025) *Gender-Responsive Mining Policies: Case studies on skills, employment, and inclusive governance*. IGF.

IIED (2021). *Islands of responsibility? Corporate sourcing of artisanal cobalt in the Democratic Republic of Congo.* International Institute for Environment and Development.

IISD (2017) Global trends in artisanal and small-scale mining (ASM): A review of key numbers and issues. International Institute for Sustainable Development. International Institute for Sustainable Development.

ILO (2019). *Gender Impacts of Structural Transformation*. ILO.

ILO (2021). *Women in Mining: Towards gender equality*. ILO.

ILO (2024). Texts adopted - International Labour Conference – 112th Session, Geneva, 2024. ILC.112/Instruments.

ILO (n.d.a). *ILOSTAT Database*. ILO.

IMF (2019). IMF Working Paper. *Is Technology Widening the Gender Gap? Automation and the Future of Female Employment*. IMF.

IMF (2023). Indonesia: 2023 Article IV Consultation-Press Release; Staff Report; and Statement by the Executive Director for Indonesia. IMF.

International Women in Mining (2017). *Women in Mining. Can a mining law unlock the potential of women?* IWIM

IOM (2019). *Supporting Brighter Futures: Young women and girls and labour migration in South-East Asia and the Pacific.* IOM.

IRMA (2022). *Gender Equality and Gender-Based Protections in Large Scale Mining: IRMA's approach in its Standard for Responsible Mining v.1.0*. IRMA.

ISID (2017). Gender and Artisanal and Small-scale Mining in Central and East Africa: Barriers and benefits. ISID.

Istiandari R and Anandhika M R (2018). The Role of Gender in Micro and Small Enterprise Business Development in Indonesia: A firm-level analysis. Asia Pacific Foundation of Canada.

ITC (n.d.). Trade Map. ITC.

IUCN (2024). Nickel rush in Indonesia: deforestation rates double around nickel-processing plants. IUCN.

Karsadi K (2023). Multidimensional Impacts of Nickel Mining Exploitation towards the Lives of the Local Community. Jurnal Ilmu Sosial dan Humaniora.

Lawson L (2021). The DRC Mining Industry: Child labor and formalization of small-scale mining. Wilson Center.

Lukamba A A (n.d.). Empowering Women in Cobalt Mining. Fair Cobalt Alliance.

Malik R (2024). Stakeholder views on the uptake of sustainable and responsible nickel mining and processing supply chains for electric vehicles in Indonesia. Cambridge: MIT Master of Science in Technology and Policy Thesis.

Ministry of Energy and Mineral Resources (MEMR) (2021). Indonesian Minerals, Coal, and Geothermal Resources and Reserves 2021: Executive Summary. World Bank.

Mutermeri N (2024). Mineral Resource Governance in Africa - A Comparative Study. International IDEA.

OECD (2018). OECD Studies on SMEs and Entrepreneurship SME and Entrepreneurship Policy in Indonesia

OECD (2019). Interconnected Supply Chinas: A comprehensive look at due diligence challenges and opportunities sourcing cobalt and copper from the Democratic Republic of the Congo. OECD.

Paschal M and Kauangal J (2023). "Women position in artisanal and small-scale mining in sub-Saharan Africa: A systematic literature review". Resources Policy. 81.

Pugliese F (2021). "Mining companies and gender(ed) policies: The women of the Congolese Cupperbelt, past and present". The Extractive Industries and Society. 8(3).

RAID & AFREWATCH (2024). Beneath the green: How cobalt mining in the Democratic Republic of the Congo is harming the environment and communities. RAID & AFREWATCH.

RCS Global Group (2021). Better Mining: Saving the EV revolution. RCS Global Group.

Responsible Mining Foundation (2022). RMI Report 2022.

Rodrigues C U, Mususa P, Büscher K and Cuvelier J (2021). "Boomtown urbanization and rural-urban transformation in mining and conflict regions in Angola, the DRC and Zambia". Sustainability. 13(4).

Seguino S and Braunstein E (2018). 'The Costs of Exclusion: Gender Job Segregation, Structural Change, and the Labor Share of Income', Development and Change 50(4): 976–1008.

Sovacool B K (2021). "When subterranean slavery supports sustainability transitions? Power, patriarchy, and child labor in artisanal Congolese cobalt mining". The Extractive Industries and Society.

Squadrone S, Burioli E, Monaco G, Koya M M, Prearo M, Gennero S, Dominici A and Abete M C (2016). "Human exposure to metals due to consumption of fish from an artificial lake basin close to an active mining area in Katanga (D.R. Congo)". Science of The Total Environment.

Sudaryat S, Yuanitasari D and Judiasih S D (2024). Policy and Implementation of gender equality in Indonesian mining companies as an approach to achieve the goals of Indonesian SDGs. Cogent Social Sciences. 10(1).

Suherman I, Rochani S and Cahyaningtyas (2021). "Value-added analysis of the electric vehicle battery industry in Indonesia". IOP Conference Series: Earth and Environmental Science. 882.

Tejani S, Kucera D (2021). *Defeminization, Structural Transformation and Technological Upgrading in Manufacturing*.

Traoré M, Hilson G and Hilson A (2024). "Reimagining entrepreneurship in the artisanal and small-scale mining sector: Fresh insights from sub-Saharan Africa". *Africa Journal of Management*. 10(2). pp.176-207.

UNCTAD (2017a). *UNCTAD Trade and Gender Tool Box.* UNCTAD.

UNCTAD (2017b). Using trade policy to drive value addition: Lessons from Indonesia's ban on nickel exports. UNCTAD

UNCTAD (2020). *Commodities at a Glance: Special issue on strategic battery raw materials*. UNCTAD.

UNCTAD (2023a). *Commodities and Development Report 2023: Inclusive diversification and energy transition*. UNCTAD.

UNCTAD (2023b). *Inclusive Diversification and Energy Transition*. UNCTAD.

UNCTAD (2023c). *Technical Note on Critical Minerals: Supply chains, trade flows and value addition*. UNCTAD.

UNCTAD (2023d). *Trade and Entrepreneurship in Indonesia from a Gender and Development Perspective*. UNCTAD.

UNCTAD (2024). *Structural Transformation through Domestic Value Addition in Commodity-Producing Developing Countries*.

UNDP (2022). *Lithium in Latin America: A new quest for "El Dorado"?*

UNDP (2024). *Potential Impact of the Lobito Corridor and Support to the Regional Transformation Agenda*. UN Zambia.

UNDP (2024). *Women in Science, Technology, Engineering, and Mathematics (STEM) in the Asia Pacific*. UNDP.

UNECA (2024). *Zambia and DRC to Implement an Innovative Transboundary Battery and Electric Vehicle Special Economic Zone*. UNECA.

UNEP (2020). *Mineral Resource Governance in the 21st Century Gearing Extractive Industries Towards Sustainable Development.* UNEP.

UNESCO (2024). *What you need to know about the challenges of STEM in Africa.*

UNHR (2011). Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework. New York and Geneva: United Nations.

UNIDO (2023). *Revitalizing TVET in the DRC: Public-private partnership for industrial skills development and youth employment kicks off.*

United States Survey (2024), *Mineral Commodity Summaries: Nickel*. United States Department of the Interior.

UN Partnership for Action on Green Economy (2024). *Policy Brief: Impact of Electric Vehicles Adoption and Development on Indonesia's Green Economy Progress*.

UNU-Wider (2025). *Indonesia's nickel boom: What can resource-rich countries learn?* WIDER Research Brief 2025/4. UNU.

UN Women (2016). *Promoting women's participation in the Extractive Industries Sector Examples of emerging good practices*. UN Women.

UN Women (n.d.-a). *Global Database on Violence against Women: Democratic Republic of the Congo.* UN Women.

UN Women (n.d.-b). *Global Database on Violence against Women: Indonesia.* UN Women.

WEF (2020). *Making Mining Safe and Fair: Artisanal cobalt extraction in the Democratic Republic of the Congo.* WEF.

WEF (2023). *Global Gender Report 2023: Insight report*. WEF.

White & Case (2023). *The effect of women on environmental, social and governance factors*.

WILPF (2016). *Life at the Bottom of the Chain: Women in artisanal mines in DRC.* WILPF.

World Bank (2009). *Mining Together: Large-Scale Mining Meets Artisanal Mining, a Guide for Action*. World Bank.

World Bank (2015). *Resources and Resourcefulness: Gender, conflict, and artisanal mining communities in Eastern Democratic Republic of the Congo*. World Bank.

World Bank (2016). *Indonesia's Structural Transformation Offers Clues on where to Find Good Jobs*. World Bank.

World Bank (2017). *Advocacy for Women's Rights in DRC's Mines Gains Momentum*. World Bank.

World Bank (2020a). *2020 State of the Artisanal and Small-Scale Mining Sector*. World Bank.

World Bank (2020b). *Delve Country Profile: Indonesia Artisanal and Small-Scale Mining Sector*. World Bank.

World Bank (2021a). *Cobalt in the Democratic Republic of Congo: Market analysis.* World Bank.

World Bank (2021b). *Women's Economic Empowerment in the Democratic Republic of the Congo: Obstacles and Opportunities*. World Bank.

World Bank (2022). *Expanding the Role of Women in Indonesia's Extractives Sector*. World Bank.

World Bank (2023). *2023 State of the Artisanal and Small-Scale Mining Sector*. World Bank.

World Bank (2024a). *Women, Business, and Law 2024, Congo, Dem. Rep.* Washington, D.C.: World Bank.

World Bank (2024b). *Women, Business, and Law 2024, Indonesia.* Washington, D.C.: World Bank.

World Bank (2024c). *The Business Case for Gender and Mining.* Washington, D.C.: World Bank.

World Bank (2024d). *Achieving Sustainable and Inclusive Artisanal and Small-Scale Mining (ASM): A Renewed Framework for World Bank Engagement.* World Bank.

World Bank (n.d.). *World Development Indicators*. World Bank. WTO (2022). *Indonesia: Measures Relating to Raw Materials*. WTO.

Zulaika S and Labiro R (2025). *The Social Transformations within the Nickel Sector in Morowali & North Morowali*. AEER.

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