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Critical minerals in Africa

A regional overview

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Abstract

Advanced and emerging economies are competing to secure the critical minerals needed for the digital and green transitions, defence and advanced manufacturing. Africa holds a large share of these resources but accounts for only 10.6% of global critical mineral exports, almost all of them raw or semi-processed. This Regional Note examines Africa's current and potential role in supply chains for cobalt, copper, graphite, lithium, manganese and nickel. It reviews production, investment and trade patterns and the main constraints on the sector, then sets out the fundamentals African countries need to benefit from their resources: robust geological information systems, updated legal and fiscal frameworks, stronger linkages to the wider economy and formalised artisanal and small-scale mining. It concludes with recommendations for African governments, regional institutions, international partners and supply chain actors.

Foreword

The OECD Critical Minerals Initiative brings together the Organisation's expertise across a range of topics including investment, responsible business conduct, trade, taxation, development and the environment to help governments navigate one of the defining policy challenges of the coming decades. To this end, the Initiative provides comparative analysis and a platform for sustained dialogue between mineral-producing and mineral-consuming economies.

As part of the Initiative's work, this Regional Note examines Africa's current and potential role in critical mineral supply chains and identifies the policy conditions under which African countries can turn this role into broad-based development. It focuses on six minerals (cobalt, copper, graphite, lithium, manganese and nickel).

The report aims to provide an evidence-based assessment of the opportunities and policy challenges associated with Africa's growing role in global critical mineral supply chains. It aims to support African governments, development partners, investors and other supply-chain actors in identifying policy approaches that can strengthen resilience, promote responsible investment and increase the domestic value generated from Africa's mineral resources.

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Executive summary

Advanced and emerging economies are intensifying their pursuit of critical minerals essential for the digital and green transitions as well as for sectors such as aerospace and defence. Countries need to build reliable and resilient supply chains to access these minerals to maintain their economic and energy security as well as their competitiveness. Africa's vast mineral wealth – accounting for 10.6% of global critical mineral exports – positions it as an increasingly important, though still relatively minor, player in international supply chains. This paradox of abundance and marginalisation reflects deeper structural challenges that have long characterised Africa's relationship with its natural resources.

Africa's potential to supply minerals, metals and advanced materials remains largely untapped.

Mining is an important economic driver for 15 mineral-rich sub-Saharan economies but this economic centrality has not translated into commensurate control over value creation. Mining constitutes 8.8% of GDP on average in mineral-rich African countries and generates over half of export revenues, while creating millions of direct and indirect jobs. However, Africa's critical mineral exports remain overwhelmingly raw (24%) or semi-processed (72%), perpetuating the continent's subordinate position in global value chains. While processing facilities exist across Zambia, Morocco, the DRC, South Africa, and elsewhere, these represent isolated nodes rather than integrated industrial ecosystems capable of challenging established processors.

Despite abundant mineral resources across the continent, only a handful of African countries rank among the world's leading producers of minerals. The DRC dominates global production of cobalt (over 70%), South Africa and Gabon are top global producers of manganese, Guinea controls 25% of world bauxite output, and South Africa remains central to platinum group metals and chromium supply. Yet this documented wealth likely understates reality and declining exploration investment, driven by political instability, resource nationalism, and unfavourable policy shifts, means that the continent's true mineral endowments remain substantially unmapped.

The foreign investment landscape in mining is more diverse than headline narratives suggest but remains largely upstream-focused. While Chinese enterprises attract disproportionate attention due to their concentration in cobalt, copper, and lithium projects across the DRC, Zambia, and Zimbabwe, they are highly geographically and commodity concentrated. Chinese companies rank fifth in African mine ownership behind the United States, Australia, Canada, and the United Kingdom. Australian and Canadian junior and intermediate firms dominate exploration, contributing over 50% of continental exploration budgets, while Chinese investors acquire projects after discoveries are made. Critically, however, foreign investment in Africa's minerals sector remains overwhelmingly upstream-oriented, maintaining Africa's role as a supplier of unprocessed materials.

This structural positioning stems from interconnected challenges: governance gaps that leave many countries capturing only 40% of potential mineral revenues; infrastructure and logistics bottlenecks; investment gaps in developing economies' mining projects; and the formidable competitive advantages of established non-African processing facilities with their economies of scale and vertical integration.

Making the most of African countries' mineral's endowment

Africa has significant mineral resources that can be leveraged to drive the continent's development agenda. However, attaining these goals requires fundamentals to be in place. These include:

- **Comprehensive geological and mineral information systems (GMIS).** National, regional, and continental-level governments could prioritise providing more funding to undertake comprehensive geological mapping to adequately inform policy and strategy.
- **Updated legal and institutional framework for contracts and licensing.** African countries could therefore update institutional frameworks and invest in sector administration capacity building so mining codes reflect current policy ambitions beyond attracting foreign direct investment.
- **Balanced and attractive fiscal revenue collection and management.** Fiscal policies should ensure that a fair share of the resource rents goes to the state; offer predictable revenue flows without discouraging investment; and be resilient against price swings and corporate tax avoidance.

Policy action should support the formalisation of artisanal and small-scale mining activities (ASM), which supply international markets and provide incomes for millions on the continent. This strategic imperative - long recognised by continental, regional and national authorities - will unlock the full potential of ASM exploitation and limit external negativities.

Foreign investment in mining and metal assets in African remains constrained by a number of perceived and actual operational and governance risks, including environmental challenges, pervasive corruption and fragile contexts where conflict and human rights violation remain widespread. African governments, supported by international partners and with the active participation of supply chain actors and civil society organisations, can leverage the significant expertise accumulated in the past 20 years in parts of the continent to tackle these risks and challenges. Regional initiatives like the ICGLR Protocol on the illegal exploitation of natural resources, amongst others, provide meaningful insights that could inspire similar approaches on other parts of the continent.

Leveraging continental initiatives and regional cooperation to unlock value addition perspectives.

The current mineral boom offers a window of opportunity to break this cycle. However, success relies on developing a national, regional, and continental industrial strategy for the mining sector.

- Efforts to expand into midstream and downstream processing will require robust and well-articulated industrial, investment and fiscal policies to ensure that African jurisdictions can increase their investment profile while supporting the development of local manufacturing sectors.
- Continental and regional coordination and cooperation will be key to unlock value addition perspectives in Africa. Coordinated regional processing hubs that source ore from multiple countries can operate at greater scale, limit excess capacity and are more cost-competitive in global markets.

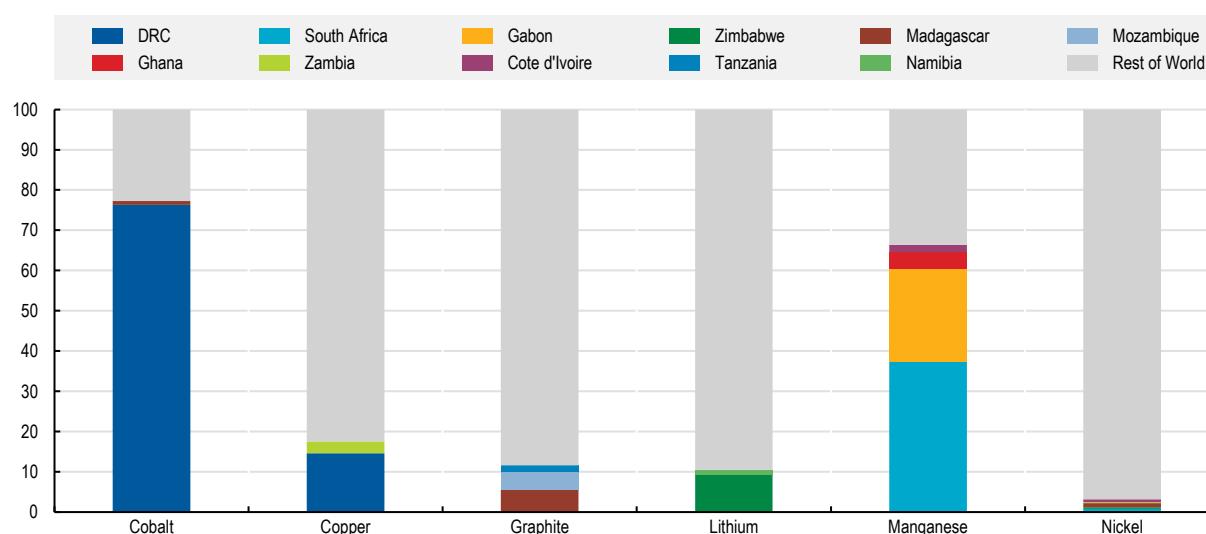
- Emerging continental frameworks therefore represent a strategic opportunity to move in that direction. The African Continental Free Trade Area (AfCFTA) provides the essential framework for collaboration, offering a route toward greater regional integration through improved trade facilitation, potentially encouraging intra-African trade of mineral resources and development of regional mineral value chains.
- While several mineral-rich states have identified their own strategic minerals and are experimenting with industrial policy tools, comprehensive strategic mineral strategies are not in place across Africa. Adopting national development plans that integrate mineral resource development with local beneficiation objectives would support African countries' development ambitions.

1 Africa's mining sector: current landscape and future prospects

1.1. Overview of critical mineral resources in Africa

Only a few African countries rank among the leading producers globally of the six minerals included in this study – cobalt, copper, graphite, lithium, manganese, and nickel. Their global share ranges from just 1% (Namibia's lithium) to over 70% (Democratic Republic of Congo (DRC)'s cobalt). Africa, in aggregate, is a notable producer of only cobalt and manganese (cobalt from DRC and manganese mainly from South Africa and Gabon).

Figure 1. Mineral production by African country by % of world total (2024)



Note: Mineral Commodity Summaries by the US Geological Survey (USGS) only include data for the top 10 to 15 global producers of each mineral, so it is not a comprehensive list of production by all countries. Data for 2024 from 2025 editions was used for all minerals except nickel for which data were collected from the British Geological Survey, being Africa absent from USGS data given its limited role in global production. Source: Authors' construct using data from "USGS Mineral Commodity Summaries" by mineral.

Cobalt and graphite are among the most strategically vulnerable minerals due to production and market concentration, i.e. heavy reliance on a small number of countries for both supply and demand. For example, 76% of the world's cobalt – used in batteries, including energy storage and electric vehicles (EVs) batteries – is extracted from the DRC, with 60% of it being refined in China (U.S. Geological Survey,

2025^[1]). In contrast, minerals like copper are widely produced and traded, suggesting a more stable and competitive market environment.¹

African production of the minerals included in this study has grown since 2008.² Covid-19 disruptions temporarily slowed this trajectory. Nonetheless, notable increases in African production of cobalt, graphite, and manganese can be seen leading up to 2021, driven by increased demand associated with green technologies, defence systems, and digital infrastructure.

Beyond the six minerals in this study, Africa is central to production of bauxite (Guinea, 25% of world output), platinum group metals (PGMs) and chromium (South Africa), and iron ore (Guinea's Simandou deposit) (Guj et al., 2025). These feed into essential supply chains - from steel and renewables to EV motors and electronics - broadening Africa's strategic role.

1.2. Trends by mineral

1.2.1. Cobalt

Africa's production is concentrated in the DRC, which accounts for roughly 76% of global mined cobalt (2024), followed by very marginal production in Zambia and Madagascar (U.S. Geological Survey, 2025^[1]). Proven reserves in DRC and Madagascar represent about 57% of the world's total reserves (U.S. Geological Survey, 2025^[1]). Cobalt underpins EVs and battery storage, superalloys, power cables, electrification, motors, renewable plant wiring (U.S. Geological Survey, 2022^[2]).

Current trends: Global cobalt mine and refinery production reached record highs in 2024, driven by expansion in DRC and Indonesia. Refined cobalt production and consumption remain dominated by China (though the rapid growth of cobalt-free lithium iron phosphate (LFP) batteries in the Chinese market has reduced the proportional demand for cobalt-intensive chemistries) (Cobalt Institute, 2025^[3]) (Oxford Institute for Energy Studies, 2025^[4]) (International Energy Agency, 2023^[5]). New production of mined and refined cobalt has led to excess global supply and lower cobalt prices, triggering global reactions – most notably, a ban on cobalt exports introduced by the DRC in February 2025 aimed at constraining supply and shoring up cobalt prices (which ban has since been converted into an export quota).

Future demand and supply: Cobalt demand will increase by almost 70% by 2040 largely driven by EVs. Production at current project pipeline is expected to decrease after 2030. The risk of interrupted cobalt supply, illustrated clearly with the DRC's 2025 cobalt export ban, is hastening technology innovations away from cobalt to low-cobalt or no-cobalt battery alternatives, which will reduce demand for cobalt in the coming years. Regardless of demand trends for cobalt, it will continue to be produced where it is a co-product of mining other key minerals, notably nickel in Indonesia and copper in DRC and Zambia. The DRC's global cobalt production share will decrease by 2040, but it will remain the main global producer, accounting for around 50% of global supply. Supply from Indonesia will expand as nickel production increases. No African country contributes or will contribute significantly to global refining (International Energy Agency, 2025^[6]).

1.2.2. Copper

African production is largely concentrated in Zambia and DRC, comprising 14.5% and 3% of global production in 2024, respectively. In 2024, the DRC was the second largest producer of copper globally, after Chile (U.S. Geological Survey, 2025^[1]). It overtook Chile to be the world's second-largest copper refiner (cathode stage), producing 8% of global supply, after China, which maintains dominance of global refined copper supply with 45% of production in 2024 (International Energy Agency, 2025^[6]). Proven African reserves are in the DRC and Zambia, together accounting for 10% of global reserves (U.S. Geological Survey, 2025^[1]). Copper underpins electrical wiring, renewable technologies and infrastructure, and power transmission.

Current trends: Copper prices have steadily increased over the past decade, driven by rising demand and a supply trajectory that - unlike most other critical minerals - has not kept pace with global needs. Recent disruptions at several major copper mines have further tightened supply.³ As both demand and prices continue to rise, African producers - particularly the DRC and Zambia - stand to benefit, especially if they are able to scale up production to help address the anticipated global supply deficit.

Future demand and supply: Copper demand will increase by over 37% by 2040 driven by the electricity sector and EVs. The DRC will be the second largest global supplier by 2040, providing 14% of global supply, after Chile (26%), increasing its share from 12% in 2024.⁴

1.2.3. Graphite

African production is concentrated in Madagascar and Mozambique, which produce 5.5% and 4.6% of global production, respectively, with Tanzania being a more minor producer at 1.5% of global production (U.S. Geological Survey, 2025^[1]). Reserves are in the same countries, together accounting for 25% of the world's total (U.S. Geological Survey, 2025^[1]). Graphite is used in lubricants, the anodes of batteries, and fuel cells (U.S. Geological Survey, 2022^[2]).

Current trends: In 2024, China was the world's leading graphite producer, producing an estimated 78% of total world production; however, African supply is expected to grow as global markets seek diversification. Demand fluctuations in the battery sector and the rise of synthetic graphite have depressed prices recently (U.S. Geological Survey, 2025^[1]), but medium-term prospects remain positive given growing interest in natural graphite from Africa.

Future demand and supply: Africa is expected to become the second largest producer of graphite by 2040 after China, with Mozambique and Madagascar supplying 23% of global supply, up from 6% in 2024.⁵

1.2.4. Lithium

African production is mostly in Zimbabwe, which accounted for 9.3% of global production in 2024, with more limited output in Namibia. Zimbabwe holds nearly all of Africa's 1.6% share of global reserves⁶, with Namibia accounting for a very small share (U.S. Geological Survey, 2025^[1]). Lithium is vital for rechargeable batteries, especially EV batteries (U.S. Geological Survey, 2022^[2]), with battery energy storage systems (BESS) becoming a fast-growing source of lithium demand, expected to shape market dynamics in the coming years (Lee, 2025^[7]). It also has significant use in several modern technological applications, such as in mobile phones, nuclear fusion, air purification, specialised alloys and fuel additives for aeronautical use (Guj et al., 2025^[8]).

Current trends: Global production increased by 18% in 2024 driven by strong demand from the lithium-ion battery market and high lithium prices from 2021 to early 2023. Global consumption in 2024 increased by 29% compared to 2023. Concern about a short-term lithium oversupply and weaker-than-expected EV sales worldwide during the first half of 2024 caused the price for lithium to decrease considerably throughout the year. Despite many lithium projects being postponed or cancelled in 2024 owing to low prices, significant production capacity expansions occurred in Argentina, Chile, China, and Zimbabwe where projects were already underway (U.S. Geological Survey, 2025^[1]).

Future demand and supply: Lithium demand will increase almost six-fold by 2040. Supply at current pipeline projects will peak around 2030 and then start decreasing. African output will remain modest with Zimbabwe decreasing from 9% of global production in 2024 to 6% in 2040. Although lithium refining is taking place in Zimbabwe, no African country will contribute significantly to global refining.⁷

1.2.5. Manganese

Production is dominated by South Africa and Gabon, followed by Ghana and Cote d'Ivoire. Together, they account for 66% of global production, with South Africa and Gabon accounting for almost 37% of global reserves (U.S. Geological Survey, 2025^[1]). Traditionally tied to steelmaking (utilizing approximately 90% of the global supply), demand is increasingly driven by high-purity manganese for EV batteries. Manganese has no viable substitute to date, especially for steel production (U.S. Geological Survey, 2022^[2]).

Future demand and supply: Demand will grow, driven by increasing demand from the steel and EV and energy storage battery sectors.

1.2.6. Nickel

African production remains limited, contributing about 3% of global output mainly from Madagascar (1%), South Africa (0.7%) and Cote d'Ivoire (0.7%) (Idoine et al., 2025).⁸ African reserves in South Africa, Zimbabwe, and Madagascar accounted for around 5% of global reserves in 2023 (Guj et al., 2025^[8]) (Nickel Institute, n.d.^[9]). Nickel is used in stainless steel, superalloys, and rechargeable batteries (U.S. Geological Survey, 2022^[2]). While nickel has long been used in nickel-cadmium batteries, its growing role in lithium-ion battery production for energy storage and EV batteries is an important shift in its applications, which accounted for 13% of global nickel consumption in 2023 (Government of Canada, 2026^[10]). Nickel acts as a substitute for the more expensive cobalt in the manufacturing of EV batteries, which has led to global momentum in the development of new nickel mining projects (Idoine et al., 2025).

Current trends: Global nickel production between 2019-2023 has increased by 47%, and in 2024 has grown by more than 15%, driven by huge growth in Indonesia (Idoine et al., 2025^[11]).

Future demand and supply: Nickel demand will continue to increase globally driven by energy storage and EV batteries and so will production at current pipeline projects. No African country makes it to the top producers in 2024, and it is not expected to do so by 2040.⁹

1.3. Challenges facing Africa's mining and metals sector

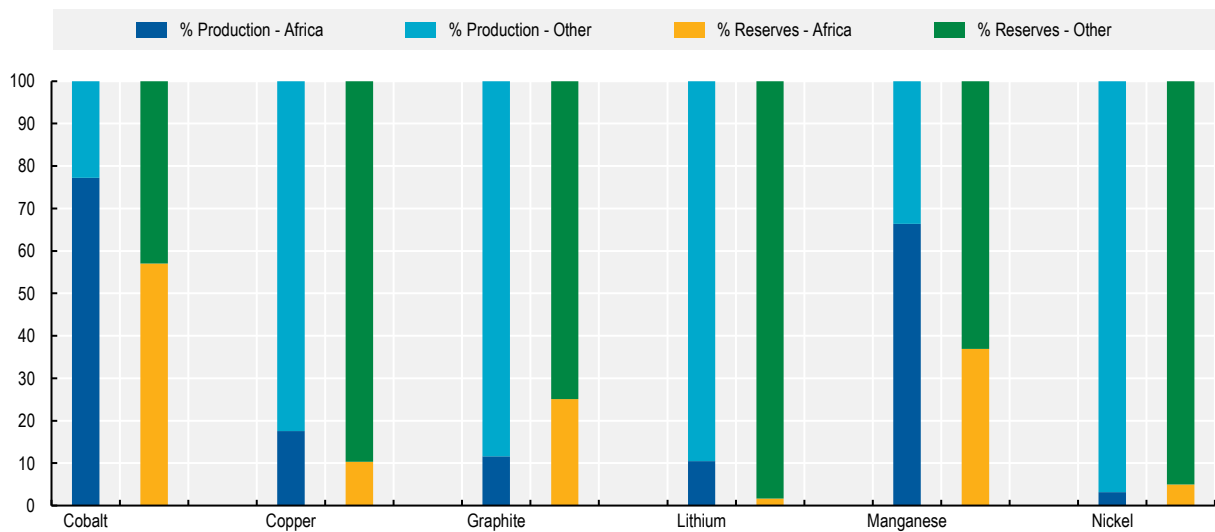
Africa's mineral endowment is strategically important both for advancing its own industrialisation agenda and for meeting the needs of external partners seeking secure supplies. Yet persistent structural and policy constraints risk locking the continent into a low-value, extractive role. The core challenges holding back African mineral processing and value addition – financial, governance-related, geography-related, infrastructural, dynamics of global markets, and geopolitical – are deeply interconnected and mutually reinforcing. African economies' ability to benefit from the rising demand for key minerals will depend on what share of new investment in exploration and mining Africa can secure, as well as the extent of mineral processing and value addition they are able to achieve. Policy, regulatory, and investment conditions – not geology alone – will determine whether the continent can benefit from growing demand for the metals essential to the global defense industry, digital and clean-energy transitions (Guj et al., 2025^[8]) (Galeazzi, Cust and Steinbuks, 2020^[12]).

A comparison of Africa's share of global production and reserves reveals structural asymmetries. For some minerals like cobalt and manganese, Africa produces a much larger share of global supply than its share of known reserves. For example, Gabon produces 23.2% of the world's manganese but holds only 3.6% of proven reserves (United States Geological Survey, 2025^[13]). One would expect production to roughly match the reserve share, yet this is not the case. This mismatch could mean African deposits are easier or cheaper to mine than deposits elsewhere. However, it more likely indicates that reserves are underestimated because too little exploration has been done.

The opposite pattern also exists. For minerals like graphite and nickel, Africa has a large share of reserves but produces less than expected. This means the minerals are present but are not being extracted - often because of difficult investment conditions, remote or expensive deposits, or because other countries have better deposits that are easier or cheaper to mine.

Overall, the continent's mineral wealth is likely understated. Expanded exploration efforts could therefore substantially reshape global assessments of Africa's role in critical mineral supply.

Figure 2. Overview of mineral production and reserves in Africa vs other, in 2024 (in % of world total)



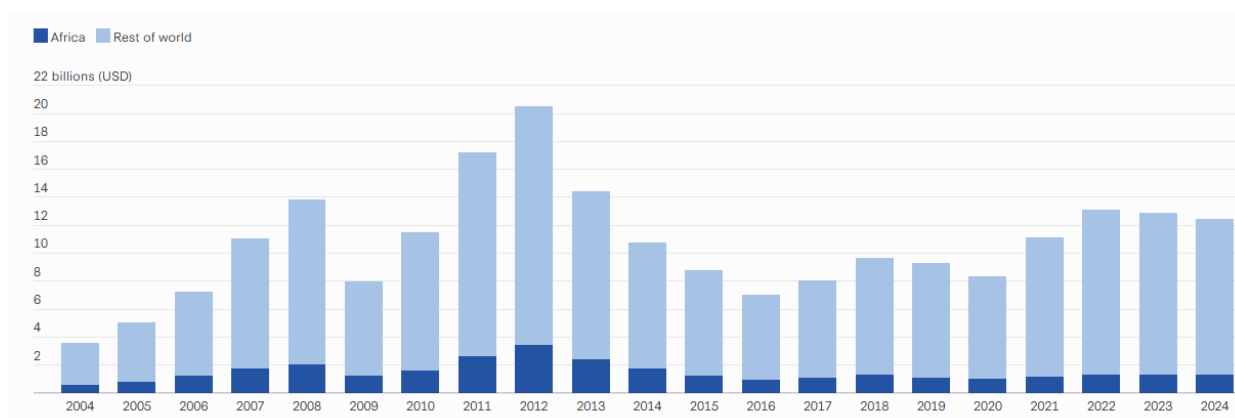
Note: Mineral Commodity Summaries only include data for top 10-15 global producers of each mineral, so it is not a comprehensive list of production by all countries. Data for 2024 from 2025 editions was used for all minerals except nickel; data for nickel is for 2014 from 2015 edition as no African countries appear in leading nickel producers after 2020.

Source: Author construct using data from "USGS Mineral Commodity Summaries" by mineral, 2025.

1.3.1. Underinvestment in African exploration

The underinvestment in African exploration is seen by Africa's share of global exploration investment having declined from 16% in 2004 to just 10.4% in 2024 (Baskaran, 2025^[14]). This is despite Africa hosting 20% of new mineral discoveries (Guj et al., 2025^[8]).

Figure 3. Africa's mineral exploration investment vs rest of the world between 2004 and 2024



Source: S&P Global Capital IQ Database via Baskaran, 2025.

Primary drivers behind the decline of exploration investment in Africa are political instability and conflict, as well as increased resource nationalism, which has led to policy changes less favourable to investors, thereby discouraging exploration investment (Baskaran, 2025^[14]). Volatile political environments and armed conflict raise the cost of doing business and the risk of damage to infrastructure, discouraging investment. Unpredictable regulatory environments and concerns over changes to fiscal regimes or contract stability, including the risk of retroactive contract renegotiations, deter long-term commitments. These risks disproportionately affect smaller, junior mining companies, who contribute to over 60% of new discoveries today. Discouraging juniors from exploration reduces the future pipeline of mine development in a country.

The comparatively low attractiveness of some African countries as investment destinations is also seen in Africa's low rankings on the Fraser Institute Annual Survey of Mining Companies 2024. Half of the 10 least attractive jurisdictions for mining investment globally (of those included in the 2024 survey) were African countries (Ethiopia, Niger, Mozambique, Madagascar, and Guinea Conakry), and Africa's overall investment attractiveness scores were the lowest of any region (Mejía and Aliakbari, 2025^[15]). This poor showing is driven more by low scoring on the policy perception index (which measures the impact of government policy on attitudes toward exploration investment) than by perceptions of mineral potential (based on geographical attractiveness), suggesting the issue lies with policy and regulatory frameworks rather than mineral potential (Mejía and Aliakbari, 2025^[15]) (Mejía and Aliakbari, 2025^[16]).

Exploration budgets remain heavily concentrated in gold, which accounted for 45% of global exploration in 2024 (Joaquin, 2024^[17]) – the lowest share in a decade – though lithium and copper are attracting rising interest (Guj et al., 2025^[8]).

Despite Africa's advantages – the cost per significant discovery is about 30% lower than the global average (\$154m vs \$219m), reflecting favourable geological conditions and lower baseline costs (Guj et al., 2025^[8]) – exploration investment remains constrained. As a result, exploration funds are increasingly directed toward brownfield projects (expansions of existing mines) and mergers and acquisitions rather than greenfield discoveries, prioritising short-term returns over frontier exploration (Guj et al., 2025^[8]).

1.3.2. Barriers to local value addition

Finance constraints and unfavourable global market dynamics also limit downstream development. Upgrading from extraction to refining or component manufacturing requires significant long-term capital, technical skills, enabling infrastructure, easy market access, and cheap, reliable energy – conditions still scarce in most African economies. New processing facilities, including in Africa, face extraordinary

difficulties competing with established facilities that have far greater economies of scale, cheaper inputs, and which benefit from clustering of different mineral processing operations and closer proximity to consumer markets. While new financing models (e.g. blended finance, concessional loans, anchor offtakes) are emerging, the cost of capital for mineral processing projects remains elevated, reflecting high perceived risks. Many midstream and downstream beneficiation projects remain economically unviable in the current global market – without strong public-private partnerships that provide cheaper inputs for new processing initiatives, most countries will continue exporting raw concentrates (World Economic Forum, 2025^[18]) (International Monetary Fund, 2024^[19]). At the same time, it is far from clear that African governments should use limited public funding to subsidise mineral processing and value addition.

1.3.3. Governance gaps and informality

Many resource-rich states still lack the institutional capacity to negotiate complex concession contracts, monitor compliance, or capture fair fiscal rents. Weak oversight fuels corruption, social tensions, and environmental degradation. Artisanal and small-scale mining (ASM) compounds these governance challenges. ASM provides essential livelihoods and supplies notable shares of global cobalt and gold, but it remains largely informal, associated with unsafe working conditions, child labour, and environmental damage. Formalisation – through cooperatives, transparent licensing, and responsible sourcing frameworks – is critical both for community welfare and for ensuring international offtake credibility (United States Institute of Peace, 2024^[20]). Lessons must be learned from previous formalisation initiatives, the vast majority of which have had poor outcomes – the benefits of formalisation must exceed the costs to ASM participants, otherwise formalisation efforts will not succeed (World Bank, 2024^[21]).

1.3.4. Infrastructure and logistical bottlenecks

Effective industrial transformation requires ports, railways, reliable power and skilled labour – areas where Africa still lags. Corridor projects (for example, the Lobito Corridor linking mineral-rich DRC and Zambia to Angola's Lobito port) show the potential payoff, but they also illustrate long lead times, complex financing needs, geopolitical competition over routes, and the risk that they offer more efficient mineral extraction rather than transformative development for African countries.

1.3.5. Regional cooperation

Fragmented fiscal regimes, inconsistent regulations, and limited regional infrastructure prevent African countries from pooling leverage or achieving economies of scale in mineral processing. Coordinated policies – such as harmonised royalty frameworks, shared processing hubs, and cross-border infrastructure corridors – could reduce costs and strengthen bargaining power. Emerging continental frameworks (such as the African Green Minerals Strategy and the African Continental Free Trade Area) offer an opportunity to move in that direction, but implementation remains uneven. Without stronger regional coordination, African countries will compete against each other for the same investors rather than integrating value chains.

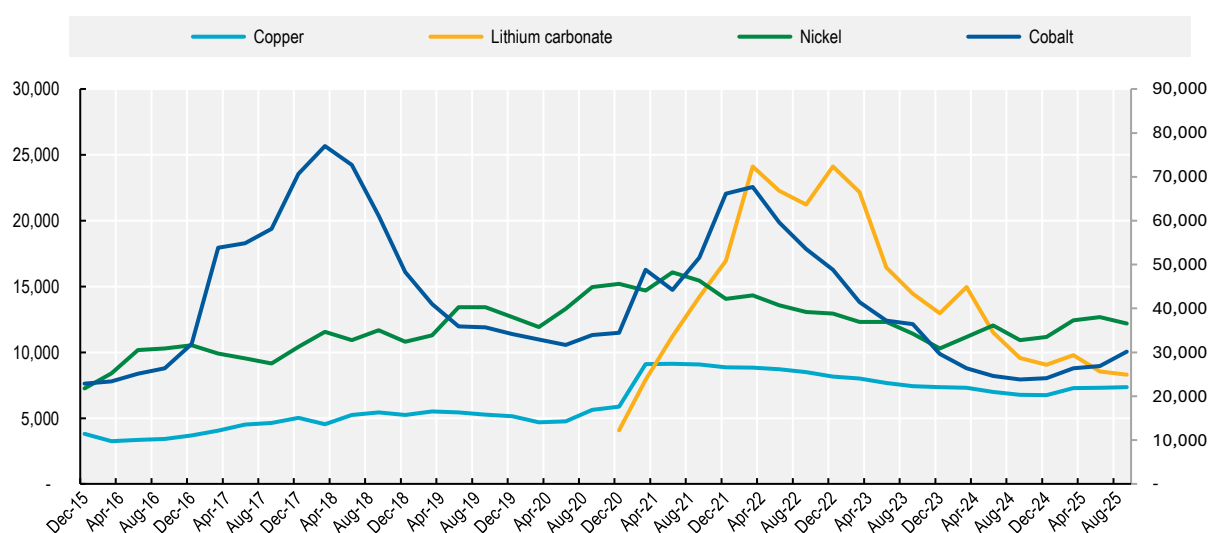
1.3.6. Dependency on exports and price volatility

Dependence on unprocessed commodity exports amplifies macroeconomic volatility and threatens government budgets in countries where mineral revenues form a significant portion of public income. Recent years illustrate various price swings driven by changes in the balance between demand and supply. Shifts in demand have resulted from global recessions, Covid-19 economic slowdowns, and growing demand for EVs, for example, and changes in supply have arisen from changes in commodity price, production disruptions, and trade restrictions imposed by dominant producers. Price changes either erode or bolster revenues from the sector, for governments as well as mining companies. Prices for some

minerals (such as lithium carbonate and nickel) have declined as supply growth has outpaced demand growth, whereas supply has failed to keep pace with demand with other minerals (such as copper).

Some notable 2025 price trends include rising cobalt and copper prices. The DRC's 2025 cobalt export restrictions (temporary export ban from February to October 2025, replaced then by export quotas) curbed global cobalt supply and so rallied the international cobalt price. This demonstrates how producer policy can affect global prices in instances where a producer holds a notable share of global market supply (Cook, 2025^[22]). But such measures, which disrupt exports or drive-up mineral prices, can accelerate mineral substitution or investor flight if not part of a broader industrial strategy. Copper prices have rallied in 2025 due to lower supply resulting from suspended operations at several leading mines, as outlined earlier. Although these mine issues are being resolved and there is increased production by Codelco mines in Chile, growth in demand for copper will continue to outpace growth in supply for the foreseeable future, leading to sustained high prices.

Figure 4. Minerals price development for copper, lithium carbonate, nickel and cobalt between 2015 and 2025



Note: Copper prices have been converted from USD/lb to USD/t for comparability. Price data for lithium carbonate is priced in CNY and has been converted (at annual average exchange rates) to USD for comparability. Data for lithium carbonate is only available for the last five years. Cobalt Prices apply to the secondary axis.

Source: Authors' construct using data from Trading Economics.

Substitution adds another layer of risk. The US Department of Energy and leading automakers (e.g., Volkswagen and Tesla) are funding technologies aimed at phasing out cobalt and lithium from EV batteries by 2030. If these efforts succeed, African producers overly dependent on these minerals could face sudden demand shocks. Diversification – into refining, midstream processing, or other economic sectors – will be critical for resilience (Guj et al., 2025^[8]).

1.4. Strategies from African economies

The minerals sector remains a cornerstone of economic activity in many African countries. Over the past decade, mining has accounted for 8.8% of GDP on average and over half of export revenues in 15 mineral-rich sub-Saharan economies (Guj et al., 2025^[8]). Beyond its fiscal importance, the sector provides millions

of direct and indirect jobs, catalysing local economies through demand for services, logistics, and infrastructure.

As global narratives increasingly frame minerals as critical to the energy transition and national security, African governments are reinterpreting the concept of “criticality” through a developmental lens. For Africa, these minerals are not only strategic for global decarbonisation – they are also potential levers for industrialisation, economic diversification, and geopolitical empowerment, driving a wave of national and continental strategies that seek to link resource endowments to domestic and regional value creation.

1.4.1. Continental and regional frameworks

1. The **Africa Mining Vision (AMV)**, adopted by the African Union in 2009 is the central policy framework guiding the continent’s approach to mineral governance. The AMV’s objective is to move from extractive rent-seeking to a “knowledge-driven African mining sector that catalyses inclusive growth, sustainable development and structural transformation” (African Union, n.d.^[23]). It promotes mineral-based industrialisation, local content policies, and regional linkages rather than isolated national projects. The **African Minerals Development Centre (AMDC)** (African Union, n.d.^[24]) – its implementing arm, established in 2013 – is tasked with coordinating the implementation and domestication of the AMV. However, so far, only four countries, namely Guinea, Mali, Zambia and Nigeria, have ratified the statute. A minimum of 15 ratifications is required to put the statutes in force and fully operationalise the centre. Only a few African countries have been nationally implementing the AMV. While countries such as Ghana, Tanzania, and Zambia have integrated aspects of the AMV into national legislation, others have progressed more slowly, constrained by fiscal and technical capacity, competing donor frameworks, and overlapping regional mandates.
2. **The African Green Minerals Strategy (AGMS)**. In March 2025, the AU adopted the AGMS, its most ambitious attempt to reposition Africa within global clean-energy value chains. Recognising that the continent holds a significant share of the world’s green minerals, the AGMS provides a continental roadmap built on four strategic pillars¹⁰:
 - a. **Advancing mineral development** through improved governance, exploration, and sustainable extraction practices.
 - b. **Investing in human capital and technological capacity** to build expertise in mining, processing, and downstream industries.
 - c. **Developing value chains** that capture more economic benefits domestically, including refining, smelting, and battery production.
 - d. **Promoting resource stewardship**, encompassing environmental protection, transparency, and responsible sourcing (African Union, 2024^[25]).

The AGMS is anchored in Agenda 2063’s vision of “an Africa that harnesses its resources for inclusive growth” (African Union Commission, 2015^[26]), positioning mineral wealth as a lever for economic diversification, climate resilience, and poverty reduction. The strategy identifies several core green minerals critical to the energy transition and industrial development: cobalt, natural graphite, lithium, manganese, phosphorus and vanadium for batteries; aluminium and copper for electrical networks; chromium, nickel and zinc for renewable energy infrastructure; platinum group metals for hydrogen technologies; rare earth elements (REEs) for magnets in electric motors and generators; plus iron, steel and alloys used throughout the economy. The AGMS frames rising global demand as an opportunity to link mineral development with economic diversification and poverty reduction through inclusive growth.

1.4.2. National strategies and policy shifts

On the country level, several mineral-rich countries have identified minerals that are strategic to their economy and global industrial demand. African states are deploying diverse instruments to translate continental frameworks into practice, ranging from fiscal reforms and export bans to local content requirements and public–private partnerships. While outcomes vary, these strategies reveal a growing willingness to experiment with industrial policy in a sector long dominated by foreign actors.

Beyond adopting export restrictions – part of a wider global trend (UNCTAD, 2025^[27]) – several countries are revising fiscal regimes to attempt to capture greater value from extraction. This includes DRC introducing a super-profit tax and Ghana increasing the royalty rate on lithium to 10% (Radley, 2018^[28]) (Gyeyir and Scurfield, 2025^[29]). These efforts have not always been successful, however. For example, Zimbabwe's attempt to double the royalty rate on gold from 5% to 10% was abandoned after pushback from gold miners as it would impair the economic viability of mines (Ghana Chamber of Mines, 2025^[30]).

Yet, comprehensive critical minerals strategies are widely missing across Africa, even for countries with high economic reliance on minerals. Very few countries have policies and regulations related to critical minerals, although there is a growing recognition of the importance of critical minerals on the continent. Those countries that have adopted critical minerals strategies appear to have done so primarily in response to external interest in their resources. For example, Zambia launched its critical minerals strategy in 2024 and South Africa in 2025.

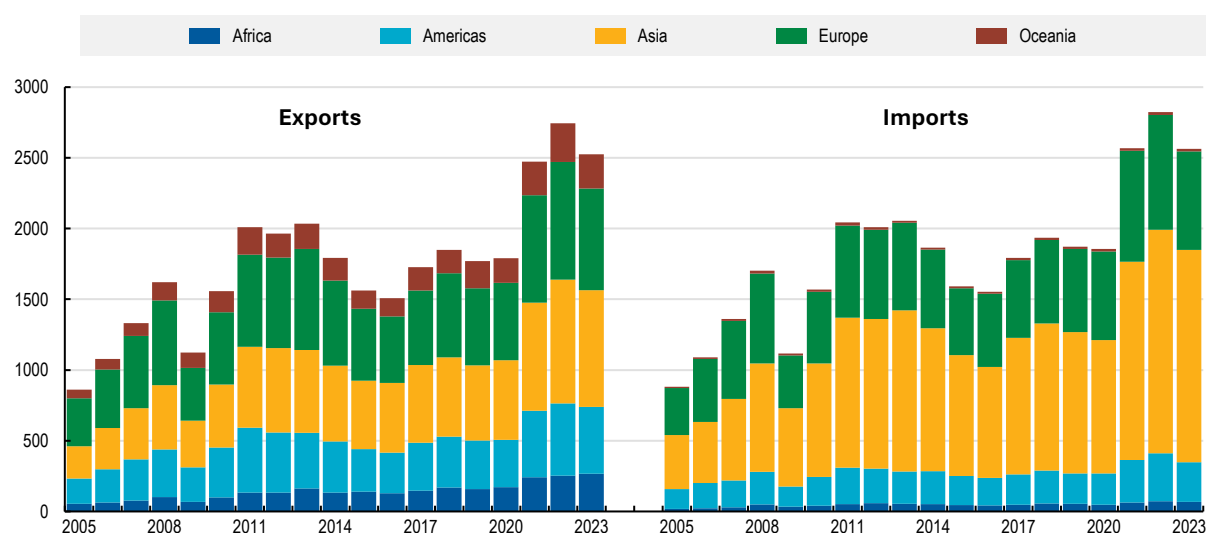
Others have policies and regulations that govern certain minerals. The DRC for instance, following the Mining Code (2018), issued Decree No. 18/042 classifying cobalt, coltan, and germanium as strategic minerals. By processing some of its cobalt locally, DRC nearly tripled its export value, with \$6 billion cobalt exports in 2022, compared to \$167 million from previously unprocessed cobalt (UNCTAD, 2024^[31]).

1.5. External engagement

1.5.1. Trade flow and Africa's role in global supply chains

In 2023, global trade in raw and semi-processed minerals reached approximately \$2.57 trillion in imports and \$2.52 trillion in exports, representing over 10% of total global exports and highlighting the sector's critical role in the international economy (UNCTAD, 2025^[32]). Africa exported nearly \$266 billion, equivalent to 10.6% of world trade in raw and semi-processed minerals, while imports stood at \$68 billion (UNCTAD, 2025^[32]). This shows Africa as a relatively minor supplier of critical minerals overall, as seen in the graph below, although its relevance is expected to grow in coming years. Of all African critical mineral exports, 24% are raw and 72% are semi-processed, predominantly ores and concentrates (ITC, 2023^[33]).

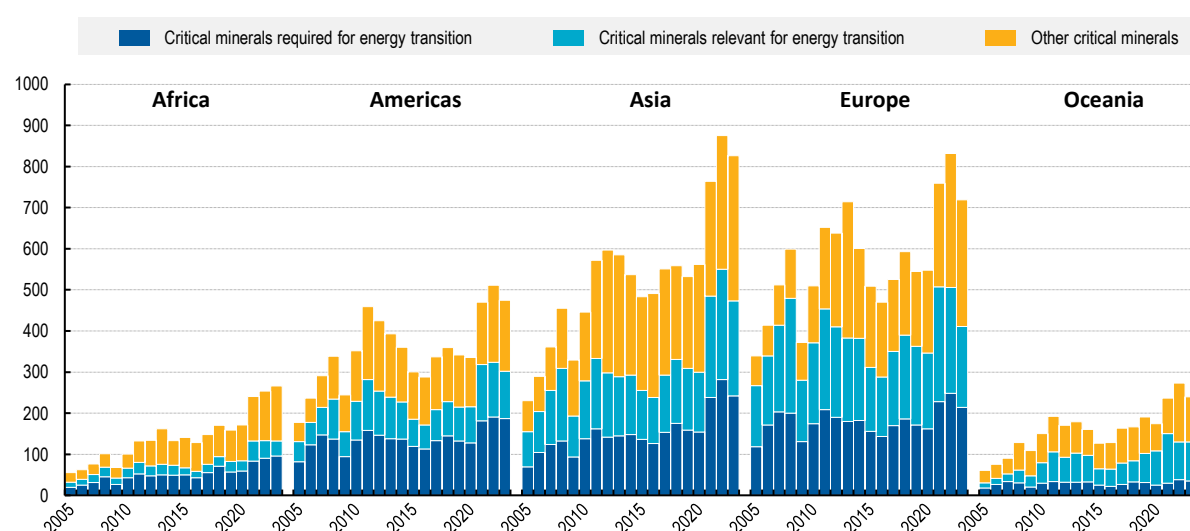
Figure 5. Total value exports and imports of raw and semi-processed critical minerals by region between 2005 and 2023 (in USD billions)



Source: UNCTAD, 2025.

Minerals essential for the energy transition accounted for over 40% of global critical mineral exports by value, reaching \$773 billion in 2023. Africa records steady growth with a gradual rise in energy transition-related minerals but continues to trail most other regions in mineral exports, as seen below.

Figure 6. Regional exports of raw and semi-processed critical minerals by category of energy-related-transition minerals between 2005 and 2015 (in USD billions)



Source: UNCTAD, 2025a

Africa emerged as the breakout performer in copper, nearly doubling exports from 2019 to 2023 (+98.2% to \$44 billion) to meet surging demand for electrical infrastructure and electric vehicles – though overall production remains behind the Americas, Asia and Europe. The continent also led nickel growth with a remarkable 122.8% surge, although off a very low base (UNCTAD, 2025^[32]).

1.5.2. Investment patterns

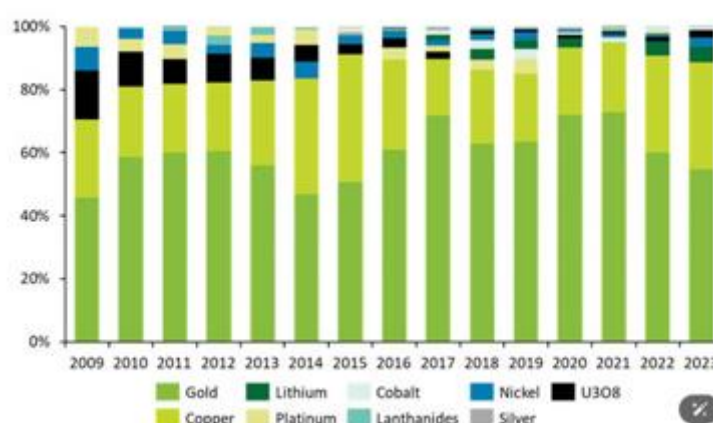
Despite growing demand, developing economies face an estimated \$225 billion investment gap in mining and processing projects, particularly in infrastructure (in particular transport and power) and productive diversification through the development of downstream processing and manufacturing capabilities beyond raw material extraction (UNCTAD, 2024^[34]). Over the last two decades, Africa's mining landscape has been reshaped by a handful of dominant investors and hundreds of smaller exploration firms.

Between 2005-2017, Chinese companies alone invested US\$58 billion in African mining and related infrastructure; cumulative investments now exceed US\$120 billion, with recent peaks in 2019 and 2023 (Mudronova, 2018^[35]) (Guj et al., 2025^[8]). Chinese state-owned and private enterprises have stakes in most large-scale projects in cobalt and lithium (Guj et al., 2025^[8]).

In 2023, junior and intermediate firms listed in Australia and Canada remain the most active in exploration, accounting for over 50% of exploration budgets on the continent, with much of this exploration capital coming from equity raised on foreign stock exchanges, while Chinese companies contributed only around 3% to exploration budgets in Africa – their preferred approach is to instead buy projects from juniors once discoveries have been made (Guj et al., 2025^[8]) (Landry, 2025^[36]).

Traditionally, gold and diamonds absorbed most mining FDI in Africa due to more predictable returns and lower infrastructure costs. Recently though, exploration spending has increasingly diversified toward energy transition minerals – notably copper and lithium (S&P Global, 2024^[37]). Yet, periods of elevated gold prices will continue to redirect exploration capital back toward gold, demand for which is unconnected to industry as its primary use is as a store of wealth. Critical minerals are more subject to the cyclical nature of investment driven by commodity prices.

Figure 7. Relative share of the greenfields exploration budget per commodity over the past 15 years across Africa



Source: USGS 2024 via African Mining, 2024

Foreign investment in Africa's minerals sector remains overwhelmingly **upstream-oriented**, although Chinese firms have an increasing number of smelters and refineries in African countries. While processing

facilities exist across the continent - particularly for traditional commodities like copper and platinum group metals - midstream processing (refining, smelting, cathode production) continues to largely take place abroad, reinforcing Africa's subordinate position in global value chains.

1.5.3. *Competing strategies of key foreign players*

There is no universal definition for the term 'critical minerals'; different countries and institutions define it based on varying criteria, including economic importance, supply chain vulnerability, and substitutability (for example, see US list in Energy Act of 2020, and EU list in Critical Raw Materials Act of 2023).

Developed countries focus more on supply risks and developing countries more on the role of minerals in generating government revenue and foreign exchange (UNCTAD, 2025^[32]). In addition, the assessment of criticality changes over time as technologies, supply chain dynamics, and strategic focus evolve. Therefore, the list of critical minerals is never fixed for any country or region but requires regular update.

Diverging definitions and taxonomies of "critical" minerals among major economies reflect different industrial priorities, and force African states to navigate a fragmented landscape of standards, financing models, and political conditionalities. This fragmentation, however, also offers leverage: African producers can strategically align with multiple partners seeking access to the same materials.

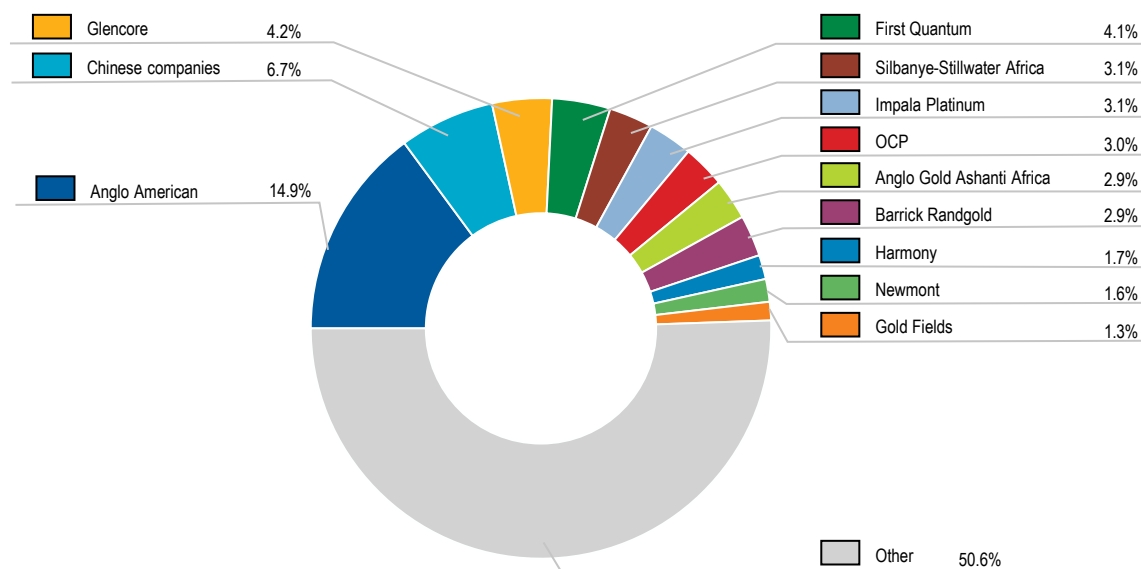
China does not publish a "critical minerals list" in the same way some other jurisdictions do, but it has strategic mineral/metal lists, export control lists, and official planning documents that cover "strategic/critical" minerals. For example, China's National Mineral Resources Plan (2016-2020) identified 24 minerals considered strategic (International Energy Agency, 2025^[38]). China has also expanded export controls on REEs and other minerals (tungsten, tellurium, bismuth, indium, molybdenum) for which it now requires export licences, reflecting that these are deemed "critical" for national security, local industry, or supply-chain leverage (Exiger, 2025^[39]).

China's dominance in the mineral value chain is structural and comprehensive. Though there is relatively less visibility on China's global mining investments, upstream extraction is prioritised (Escobar et al., 2025^[40]), and tends to be closely integrated with midstream processing and downstream demand: Chinese-built refineries and hydrometallurgical plants in Africa (e.g., the Bikita lithium sulphate plant in Zimbabwe) feed directly into China's domestic battery and EV industries. Beijing provides concessional finance (Escobar et al., 2025^[40]), infrastructure, and technology, often bundled in state-backed agreements that lock in long-term offtake contracts. However, this model faces growing scrutiny in Africa. Governments increasingly demand transparency, local content, and environmental standards, while Chinese firms face growing external scrutiny linked to ESG performance, particularly where projects rely on international finance or seek integration into European supply chains.

In 2024, Chinese FDI stock in African mining projects (including oil and gas) stood at \$10 billion, accounting for 23% of total Chinese FDI on the continent, second only to construction (China Africa Research Initiative, 2025^[41]). In 2018 Chinese companies collectively accounted for around 7% of Africa's mine production while the mining giant Anglo-American PLC alone represented more than double that share (Ericsson, Löf and Löf, 2020^[42]) (Herzer Risi and Doyle, 2023^[43]). More recent collated data is not readily available, though Chinese acquisitions since 2018 — particularly in cobalt, copper, and lithium — suggest the share has grown at the aggregate level while becoming significantly more concentrated in strategically critical commodities. In terms of mine ownership, China ranks fifth in African mine ownership, behind the US, Australia, Canada, and the UK, with ownership increasing 20% since 2019 (Barich, 2024^[44]). However, the distinction between Chinese and non-Chinese ownership is increasingly complex, as many global mining firms now feature significant Chinese equity stakes (Landry, 2025^[36]). Beyond FDI, Chinese policy banks and state-owned enterprises (SOEs) have also extended substantial loans to mineral-rich African governments, often structured as resource-backed arrangements in which infrastructure finance is

collateralized by future commodity export revenues — supporting the acquisition, development, or expansion of mines and related infrastructure (Landry, 2025^[36]) (Escobar et al., 2025^[40]).

Figure 8. Companies present in African mining



Note: Due to rounding, the total adds up to slightly over 100%.

Source: Ericsson, Löf and Löf, 2020 via Soulé, 2024.

Chinese firms, the majority of which are SOEs (Landry, 2025^[36]) have more foreign investments on the African continent than any other continent, estimated at 79 out of 184 identified active operational mines outside of China with at least 10% Chinese ownership in 2022 (Landry, 2025^[36]). But the concentration of Chinese investment is highly geographically focused and strategic. Out of the 79 Chinese-owned mines in Africa, 30 were in the DRC, 10 in South Africa, and 8 in Zambia, with 35 out of the 38 mines in the DRC and Zambia producing copper and/or cobalt (Landry, 2025^[36]). For perspective, Chinese entities own or have stakes in 29 of the approximately 40 active cobalt and copper properties in DRC (Landry, 2025^[36]). Chinese miners have invested \$4.5 billion between 2022 and 2023 to secure significant holdings in most African lithium mines in countries such as Namibia, Zimbabwe, and Mali (Guj et al., 2025^[8]). They also operate large-scale copper concessions in Zambia.

Trade patterns show a shift in African exports to China from fuel mineral (primarily coal) to non-fuel minerals and metals: the share of non-fuel minerals and metals rose from 20% in 2002 to 45% in 2023 (Development Reimagined, 2024^[45]). Most exports remain unrefined, consistent with the wider trend of African exports to China being raw materials (Development Reimagined, 2024^[45]). China is not unique in this regard, however, as other miners also predominantly export minerals from Africa in raw or semi-processed form.

The **European Union** issued its latest CRMs list in 2023 via the Critical Raw Materials Act (CRMA), identifying 34 critical minerals – up from 20 in 2020 (European Commission, n.d.^[46]). The EU revises its list every three years, with the next revision due in 2026. The Act introduced binding 2030 benchmarks — 10% domestic extraction, 40% processing, 15% recycling, and a 65% cap on dependency on any single third country — signalling a shift from strategy to regulatory ambition. However, in February 2026, the European Court of Auditors published a report concluding that the EU is not on course to fulfil its CRMA stated objectives.

Lacking a significant foothold in the critical minerals value chain globally, Europe's strategy with Africa centres on diversification, sustainability, and partnership rather than ownership. The CRMA and Global Gateway initiative articulate a dual objective: to secure supply while supporting African industrialisation and responsible sourcing.

The EU has signed strategic partnerships on critical minerals with Namibia (2022), the DRC and Zambia (2023), Rwanda (2024), and more recently the Clean Trade and Investment Partnership with South Africa (2025). These agreements aim to integrate African producers into European value chains through co-investment in refining, certification, and skills development. However, actual investment volumes remain limited; only four projects in Africa were granted 'strategic project' status under CRMA (out of a total of 60 strategic projects globally), with these projects still being in feasibility or financing stages.

Although the RESourceEU Action Plan adopted by the European Commission in December 2025 aims to address known shortcomings, including financing gaps, accelerating permitting, and reducing China dependency, and the European Investment Bank has recently signalled its willingness to fund mining and mineral processing projects, challenges remain. Development finance institutions of EU member states largely do not invest in mining and mining and mineral processing are also not included in the EU Sustainable Finance Taxonomy, barring use of sustainable finance for these sectors. Though revisions have been proposed (Platform on Sustainable Finance, 2025^[47]), the failure to align these broader EU approaches with EU objectives to scale up participation in mining and mineral processing has undoubtedly contributed to little progress on the EU side.

The **United States** issues its critical minerals list via the United States Geological Survey (USGS), with the most recent version released in 2025 (updated every three years). It identified 60 mineral commodities as critical (Mineral Resources Program, 2025^[48]), up from 50 in 2022 (U.S. Geological Survey, 2022^[2]).

Under the Inflation Reduction Act (IRA) and the Mineral Security Partnership (MSP), a coalition of 14 countries, the US sought to reduce dependency on China by financing "trusted" supply chains. The 2026 Critical Minerals Ministerial held in Washington marked a more overtly strategic posture. New initiatives such as Project Vault—designed to coordinate strategic stockpiling and secure long-term offtake among like-minded partners—and Project Forge, aimed at accelerating midstream processing and refining capacity outside China, signal a move beyond project-by-project finance toward systemic supply chain restructuring.

At the same time, the US Development Finance Corporation (DFC) continues to align its investment portfolio with national objectives. In late 2025, DFC partnered with US investment firm Orion and Abu Dhabi-based ADQ to launch the Orion Critical Mineral Consortium (Orion CMC), a \$1.8 billion financing vehicle targeting production in emerging markets. DFC pledged support for projects in Angola (REEs), Gabon (potash), Malawi (REEs), Mozambique (graphite), South Africa (REEs), Tanzania (nickel), Uganda (graphite) and Zambia (copper), alongside its commitment to the Lobito Corridor. Washington has also engaged bilaterally with Namibia, Tanzania, and the DRC to explore co-investment in refining and battery assembly. However, compared to China, the US footprint remains focused on selective, high-profile projects rather than systemic investment in African industrial ecosystems.

For **Gulf states**, metals, precious stones and minerals are the main export product from Africa. The UAE and Saudi Arabia are emerging as influential players in African mining. While gold takes the lion's share especially for the UAE, other minerals are the second most exported product (Procopio and Čok, 2024^[49]). This expansion is not merely commercial. It reflects a deliberate strategy embedded in Gulf economic diversification agendas (e.g. Saudi Vision 2030) including positioning around new energies and artificial intelligence economies, which rely on control over minerals. Gulf sovereign wealth funds are acquiring strategic stakes in several key minerals in Africa and beyond, often coupled with logistics and energy infrastructure.

Saudi Arabia's Ma'aden and its Public Investment Fund backing, has announced partnerships in REEs and phosphate projects across East and Southern Africa. Saudi Arabia's parallel push to position itself as a regional minerals processing and trading hub—reinforced through high-profile convenings such as the Future Minerals Forum—suggests intentions to export minerals from African countries in raw or semi-processed forms, reserving processing opportunities for Saudi industry.

The **UAE**, through entities such as ADQ, Mubadala, and International Resources Holding (IRH) has taken controlling stakes in key assets such as Zambia's Mopani Copper Mines (Procopio and Čok, 2024^[49]), and recently expanded its footprint through further copper, lithium, tin, iron ore and graphite investments, underscoring a long-term asset accumulation strategy rather than short-term portfolio investing. and a deliberate pivot toward securing a diversified critical minerals portfolio across Central, East, and Southern Africa. The investments also reflect an interest in securing dual-use minerals critical for both clean energy technologies and defence supply chains (Ardemagni, 2024^[50]).

More broadly, across the Gulf, critical mineral engagement is part of a broader geopolitical pivot into Africa, leveraging strengths in commodity trading, port infrastructure, and financial intermediation to position themselves as pivotal intermediaries between African producers and Asian and Western markets (Aboudouh, 2026^[51]). This model does not necessarily prioritise local industrialisation in Africa but can contribute to it.

Other actors are increasingly entering Africa's minerals sector, driven by the imperative of supply security. **Japan** and **South Korea**, highly dependent on imports, are pursuing strategic partnerships with African states, driven by tech and automotive industries. Under the umbrella of the Mineral Security Partnership, they often combine technology transfer and offtake guarantees. **India** has also entered the competition, investing in copper, lithium and phosphate projects, motivated by domestic EV and fertilizer industries.

2 Making the most of critical mineral resources

2.1. Geological and mineral information systems (GIMS)

Understanding the continent's mineral endowments is key to informing policy and strategy. This need is recognised under AMV Cluster 2, AMGF Pillar 2 and AGMS Pillar 1. The value of such geoscientific data and information is beneficial not only for the mineral sector but also for other sectors, such as planning for logistics and infrastructure such as railway routes (African Union, 2017^[52]) (African Minerals Development Centre, 2017^[53]).

Nevertheless, many national authorities (geological surveys agencies or departments) do not have adequate resources to produce, manage and disseminate data and information proficiently. This is often compounded by the lack of a proper local and transborder data policy on data standardisation and harmonisation of nomenclature, as well as resource classifications and reporting systems. There is deep and pervasive information asymmetry: private mining companies invest heavily in their own exploration data. They approach governments with sophisticated 3D seismic models, geochemical analyses, and resource estimates that are far superior to the information that the state has access to. Many African states, often unable to independently verify a concession's true worth, are forced into a reactive, unbalanced negotiating position. When the true nature of deposits becomes more apparent later, government efforts to renegotiate terms often results in lengthy, drawn-out arbitration proceedings in various national and international fora.

The lack of good GMIS also means having to resort to “first-come, first-served” or “open-door” concession systems, which typically tends to favour speculative junior miners who acquire large tracts of land for minimal cost, undertake limited exploration, and subsequently sell the licenses to larger mining corporations for significant profits (International Monetary Fund, 2019^[54]). If governments had access to more comprehensive data, competitive tender processes could be used instead to award mining licenses, which could yield better deals for African governments. When negotiating contracts, it is crucial for states to accurately estimate their resources and use these estimates as inputs into various financial models. In the absence of getting the financials right, countries often allow overly favourable fiscal and non-fiscal terms for the company, including low royalty rates and minimal signature bonuses. Strengthening the state's capacity to assess data independently can improve bargaining outcomes and ensure more equitable resource management (Otto et al., 2006^[55]).

2.2. Investing in the National Geological Survey (NGS)

The first action that needs to be taken to strengthen GMIS revolves around the policy, legal and institutional framework for geoscientific data acquisition and processing. African governments could spearhead state-led investment to transform their National Geological Surveys (NGSs) from passive archives into active, digital, and commercial-facing institutions. For this to work, there is a need to (1) modernise tools for

producing, managing and disseminating geoscientific data; and (2) undertake capacity building for personnel to interpret and manage the data.

In recent times, several countries have undertaken reforms in GMIS, including the digitalisation of existing records (moving from fragmented and often paper-based archives to integrated digital platforms). Such platforms are now the anchor for the award of mineral rights to undertake exploration, mine development and long-term planning.

National, regional, and continental-level governments could prioritise providing more funding to undertake comprehensive geological mapping, and geophysical and geochemical surveys using advanced technologies, such as airborne surveys (magnetic, radiometric), remote sensing, and AI-powered analysis to interpret large datasets. However, surveys are expensive, and many African countries lack the financial resources to fund these independently. To illustrate this, South Sudan's total landmass of 644,329 km² translates to approximately \$19 million at \$30 per square kilometre for high-resolution satellite imagery.

Improving quality and availability of geoscientific data enhances transparency and attracts foreign direct investment by lowering exploration risk. For example, Namibia's geological survey has used geological information systems (GIS) to improve lithium exploration (Schreiber and Nguno, 2008^[56]) (Ambata, 2025^[57]). The African Union's GMIS is also an example of an attempt to create a continental database for minerals such as cobalt in the DRC and graphite in Tanzania (Geological Survey of Tanzania, n.d.^[58]). These have lowered entry barriers and improved economies of scale. Such national and regional GIS can digitally map resources by integrating satellite imagery, AI-driven analysis, and ground surveys.

Sustained investment in funding training for human capital is crucial. This should go beyond just geologists and geochemists to data scientists, resource modellers, and GIS specialists. Furthermore, collaborations with universities, research institutes and regional organisations like the African Minerals and Geosciences Centre (AMGC), PanAfGeo and AfricaMaVal are vital to ensuring ongoing capacity development.

Other policy recommendations include prioritising and addressing data security issues. Lastly, standardisation and harmonisation of resource classification and reporting systems are also critical. In this regard, regional bodies such as the African Union's African Minerals Development Centre are championing the African Mineral and Resource Classification and Pan-African Reporting Code (AMREC–PARC), which aligns with the Africa Mining Vision.

2.3. Legal and institutional framework for contracts and licensing

Many African mining codes are crafted primarily to attract foreign direct investment. This approach has often resulted in a "race to the bottom", characterised by generous tax holidays, lax environmental standards, and limited community rights (Dube, Matsika and Chiwunze, 2016^[59]). While the policy and legal frameworks for awarding mineral rights have improved, several countries still have opaque, individually negotiated contracts which override national legislation and lack public transparency. Such agreements constitute a significant governance challenge, creating opportunities for corruption and undermining accountability. There are documented cases of these contracts favouring political elites at the expense of the greater populace (Fitzgerald et al., 2025^[60]) (Bourgouin, 2011^[61]) (ICMM and EITI, 2023^[62]). Furthermore, critical contractual terms, such as restrictive stabilisation clauses and low royalty rates, are often not publicly disclosed, making it difficult to independently assess the overall fiscal take. This opacity undermines public trust and reinforces perceptions of illegal resource extraction and misappropriation, fuelling illicit financial flows in the resources sector.

To improve sector governance, African countries could (1) strengthen institutional frameworks and (2) invest in sector administration capacity building. To strengthen institutional frameworks, countries must first update their mining policies and mineral development plans, including those for critical minerals. A few countries, including Zambia and South Africa have published critical minerals strategies in recent years.

However, it needs to go beyond these into having provisions to promote equitable access to licences and contracts. Other necessary actions include the need for stricter due diligence on investors by government agencies before granting mineral rights to reduce corruption risks and ensure that only financially and technically qualified companies with demonstrated ability to adhere to environmental and other legal obligations are awarded mining rights. Reviewing various mining acts to introduce competitive bidding for the more clearly delineated mineral resources can improve and ensure objectivity, compliance and transparency.

Likewise, membership in the Extractive Sector Transparency Initiative (EITI) and other global transparency initiatives can enhance standardisation, knowledge sharing, and transparency, as demonstrated in various studies (Kinda, 2025^[63]) (Dosmaganbetov and Nanovsky, 2025^[64]) (Moses, Houqe and van Zijl, 2021^[65]). Similarly, beneficial ownership disclosure helps reduce corruption risks. Lastly, there is a need to review and update Alternative Dispute Resolution (ADR) legislation to promote the timely and practical application of ADR in resolving land and mining-related disputes. This can save considerable time and costs and is of particular relevance as a proliferation of mining activities triggers more land rights disputes.

Regarding sector administration capacity building (institutional strengthening), governments and donor partners could fund staff (in mining ministries, associated agencies, and other relevant ministries) to build the required technical skills and managerial capabilities. This can include short-term training both within and outside the country, as well as support for master's and PhD programmes. Such technical assistance training is already being provided through the African Legal Support Facility (ALSF) and the African Development Bank (AfDB) to various countries (African Development Bank Group, 2023^[66]).

2.4. Fiscal revenue collection and management

Effective fiscal policies are essential for capturing the full value of mineral resources. Many African countries recover only about 40% of their potential revenues, primarily due to tax avoidance and weak enforcement mechanisms (Akiwumi, 2024^[67]) (Albertin et al., 2021^[68]). An optimal fiscal regime for mining must accomplish three goals: firstly, ensure a fair share of the resource rents goes to the state; secondly, offer predictable revenue flows without discouraging investment (stability); and lastly, be resilient against price swings and corporate tax avoidance (Natural Resource Governance Institute, 2015^[69]) (Land, 2015^[70]). This is particularly important given the key challenges of the minerals sector, such as inherent uncertainty about the resource base (in terms of quantity, quality, and depletion paths), significant rent potential, market and technology-induced volatility which affects production and costs, and the long mine lead times and heavy upfront costs (Natural Resource Governance Institute, 2015^[69]) (Land, 2015^[70]).

Many African mining fiscal regimes fall short on these three goals (Oshionebo, 2020^[71]). The royalty base is often low and offers generous tax holidays to attract investment, but it is also highly vulnerable to price crashes and aggressive tax planning by multinational corporations. Governments in the past have also sought to constantly change the fiscal regime, creating further uncertainty and distorting.

These pressures are evident in Africa's critical minerals sector. Falling lithium prices – down 80% from November 2022 peaks – have led mining companies to request fiscal concessions to maintain project viability. For instance, one major lithium project in Ghana saw its internal rate of return drop from 105% to 13.6%, prompting demands for reduced royalty rates, lower corporate taxes, and import duty exemptions (Reuters, 2025^[72]) (Jamasmie, 2025^[73]). However, civil society groups warn that granting permanent concessions during temporary price downturns could undermine long-term national interests if prices recover, recommending that governments independently verify company projections before revising fiscal terms (Gyeyir and Scurfield, 2025^[29]).

While no single tax instrument is flawless, an effective modern fiscal regime for critical minerals should comprise a balanced combination of instruments that address the state's requirements while maintaining investor confidence. Such an integrated approach for many traditional concession contracts could include:

1. **Royalties (on revenue/production):** a tax on the value of the minerals extracted. Its great advantage is that it is simple to calculate and must be paid regardless of the project's profitability. This provides a stable, minimum revenue floor for the state from day one. Royalties could be on a sliding scale tied to mineral prices or a fixed lower tier to improve profitability, given they tend to be regressive instruments.
2. **Corporate Income Tax (CIT) (on profits):** the standard tax on a company's profits. It allows the state to share in the project's success. However, effective mechanisms are necessary to audit costs and prevent base erosion and profit shifting (BEPS). CIT rates generally tend to be higher for mining than for general industry. Given that most critical minerals are bulk in form, an argument could be made for taxing them at the normal corporate tax rate rather than at higher specialised ones.
3. **Resource Rent Tax (on windfall profits):** the windfall tax kicks in only in periods of exceptionally high prices, such as seen with lithium and cobalt in 2021-2022. This would allow the state to capture a much larger share of the "windfall" profits during booms without deterring the initial investment.
4. **Reduced tax rates and incentives:** these could be extended to companies that set up processing and other downstream activities.

Other new contractual forms being considered by governments include mining production sharing agreements (PSAs), a contract between a government and a mining company where the company assumes the financial risk of exploring and extracting mineral resources, while the government retains ownership of the resources. The company is entitled to a share of the production after it recoups its exploration and development costs. PSAs are widely used in the petroleum industry (Pereira et al., 2023^[74]). Mining PSAs, although limited in their use with non-fuel minerals compared to traditional concessions, are gaining traction in the industry, with civic groups advocating for their adoption (Readhead et al., 2023^[75]) (IGF and ATAF, 2022^[76]) (Omonbude and Mataba, 2024^[77]). To the best of our knowledge, no African country is currently using mining PSAs for allocating critical mineral rights.

2.5. Linkages, investment and diversification

The evidence consistently shows that many years of mining on the continent has failed to transform the fortunes of the continent's economies significantly. Several commodity-producing and exporting countries have become caught in the so-called resource curse, also known as the "paradox of plenty" syndrome. More strategic use of critical mineral revenues will not only help African countries achieve their climate goals but will also contribute to the development of a more resilient and diversified economy.¹¹

The current minerals boom offers a window of opportunity to break this cycle. However, success relies on a clear national, regional, and continental industrial strategy that develops industrial linkages, strengthens technical skills, and invests in critical infrastructure to enable establishment of industry that is necessary for going beyond just extracting and exporting raw materials.

Most of the value within the critical mineral and energy supply chain lies in the complex midstream (processing, refining) and downstream (manufacturing of precursors, cathodes, and batteries) stages. Currently, these are primarily concentrated in Asia, particularly in China. To capture more of this value, African producers need to put in place the elements for value addition (beneficiation). These include adequate infrastructure, affordable finance, reliable and competitively priced utilities (especially electricity), a skilled workforce, a stable regulatory environment and economies of scale (Logan and Acheampong,

2025^[78]). If any of these enabling factors are missing, production costs for local manufacturers rise, making their products more expensive and less competitive.

Some existing and emerging producers have significant infrastructure for refining and smelting traditional commodities such as copper, ferromanganese, platinum group metals, and aluminium. There are facilities across Zambia, Morocco, DRC, South Africa, Ghana, Guinea, Mozambique, Cameroon, and Egypt. These mineral processing and metallurgical production plants provide a firm foundation upon for further industrialisation.

Also, for many nations, a regional approach is more viable than pursuing a standalone strategy. The African Continental Free Trade Area (AfCFTA) provides the essential framework for collaboration, creating a larger, more attractive single market. Ongoing initiatives include the Walvis Bay Corridor and the potential extension of the Lobito Corridor railway into Zambia, which is being led by the African Finance Corporation with support from the US, the EU, AfDB and others. The Lobito corridor would also anchor US DFC's recent pledge to deepen partnerships with the DRC and Rwanda (U.S. International Development Finance Corporation, 2025^[79]). The rehabilitation of the TAZARA railway, which offers an eastward route for mineral resources from Zambia's Copperbelt to Dar es Salaam in Tanzania, is instead supported by China.

Efforts to expand into midstream and downstream processing are often accompanied by robust local content policies aimed at fostering horizontal linkages across the economy. These policies should be pragmatic and extend beyond simple employment quotas, requiring mines to procure a wider range of complex services – such as engineering, financial management, logistics, and light manufacturing – from qualified local firms, often in partnership with foreign companies. Such measures are essential for building a sustainable and skilled industrial base that can outlast the lifespan of individual mining projects.

Financing the necessary infrastructure will require a blended approach. Development assistance from partners such as the World Bank's Multilateral Investment Guarantee Agency (MIGA), the EU Global Gateway, and others plays a crucial role in de-risking large-scale projects by providing political risk insurance, which can, in turn, attract additional private capital.

2.6. Maximising the contribution of artisanal and small-scale mining (ASM)

If ASM is a feature across all geographical regions, it is particularly prevalent and concentrated in African countries. ASM is characterised as labour-intensive mineral extraction, usually using low-tech equipment and processes (Karaki, 2018^[80]). It is generally informal and is pursued as a path out of poverty or to supplement insufficient income, especially in rural areas where alternative employment options are extremely limited (IGF, 2017^[81]). ASM activities are often located in close proximity to large-scale mining operations and may exploit abandoned mines where these are accessible.

ASM contributes a significant share of mining employment across much of Africa – at least 10 million miners are involved in ASM in sub-Saharan Africa, with another 60 million who are supported by or have livelihoods in associated industries (World Bank, 2019^[82]). Production volume from ASM sources vary depending on the mineral and the countries, spanning, beyond precious metals and precious gemstones, base metals (like copper) and critical minerals (tungsten, tantalum, lithium, cobalt, etc.).

The announcement in November 2025 that, through its Entreprise Générale du Cobalt, the DRC produced its first 1000 tons of traceable artisanal cobalt is a key step in formalising the sector in the country. Context-sensitive approaches that balance accountability with inclusivity are essential.

However, the nature of ASM presents a particular set of environmental and safety risks. In the absence of proper safety equipment or separation equipment, toxic chemicals used to separate minerals poisons both ASM workers and the air, water, and soil around ASM operations. Small-scale miners often leave their open pits unrehabilitated and deforestation is increasingly associated with an expansion in ASM activities.

As demand for critical minerals grows, ASM has further proliferated, with a commensurate increase in mine accidents and fatalities.

In order to unlock the full potential of ASM exploitation on the continent and limit the external negativities associated to this sub-sector, a protracted, coherent combination of policy measures and market interventions to support the formalisation and legalisation of ASM activities need to be deployed. African governments as well as international partners have long identified this strategic imperative. However, due to its considerable set of challenges, ASM formalisation remains limited in Africa.

3 Responsible business conduct to support strategic investment

3.1. Persisting challenges are increasingly met with regional responses

The relationship between RBC and conflict prevention has become a defining feature of mineral governance since the early 2000s, with a strong connection to mining governance on the African continent. The Kimberley Process Certification Scheme (2003) was a landmark in preventing the financing of armed groups through trade of conflict diamonds. Its success inspired similar models in other minerals. The International Conference on the Great Lakes Region (ICGLR) regional protocol against the illegal exploitation of natural resources is another testimony to the continent's acknowledgment of the need to address the persistent connection between mineral production and trade and risks of conflict financing, serious abuses of human rights and serious economic crimes.

In consuming markets, the United States' Dodd-Frank Act (Section 1502, 2010) and the European Union's Conflict Minerals Regulation (2017) expanded the regulatory landscape by introducing mandatory due diligence and traceability obligations across mineral supply chains, particularly for tin, tungsten, tantalum, and gold. More recent legislation – the European Union's Corporate Sustainability Reporting Directive (CSRD, 2024) and the Corporate Sustainability Due Diligence Directive (CSDDD, 2024) – reflects a new era of convergence between sustainability and human rights law. Together, these measures compel companies to identify, prevent, and mitigate adverse human rights and environmental impacts throughout their operations and value chains.

However, applying such frameworks in fragile African contexts remains extremely challenging. ASM is a vital source of livelihood for millions but is often informal, underregulated, and vulnerable to exploitation by armed actors. When implemented through overly strict compliance approaches, due diligence and traceability requirements can inadvertently exclude artisanal producers, depriving communities of income and pushing trade underground.

3.2. Labour and human rights

Labour and human rights challenges such as child labour, unsafe conditions, and gender discrimination continue to undermine responsible mining in Africa, particularly in ASM communities. In response, a range of international, national, and community-based initiatives have emerged, including International Labour Organisation (ILO) programmes to eliminate child labour, UNICEF- and industry-backed funds in the DRC to support education and alternative livelihoods, and advocacy efforts to strengthen women's participation and protection. Similar interventions across countries such as Ghana, Tanzania, and Côte d'Ivoire combine formalisation, labour inspections, education support, and local monitoring, reinforced by regional and multi-stakeholder responsible sourcing initiatives. While these efforts signal growing commitment, their impact is constrained by weak enforcement, inconsistent funding, and persistent poverty, highlighting the need for long-term structural reforms focused on education, livelihoods, and stronger local governance.

3.3. Environmental challenges

While most environmental issues linked to mining are common across all mining jurisdictions, there are several issues that are particularly acute or distinctive in the African context. These aspects include in particular mining in protected areas or biodiversity hotspots, water scarcity aggravated by mining's high demand for water, and a history of poor mine closure and rehabilitation.

Mining in protected areas. Mine development is increasingly taking place within protected areas in Africa, due to undeveloped legal frameworks, insufficient government enforcement capacity, and corruption in issuing mining permits (Beevers, 2015^[83]). Removing restrictions on protected land through downgrading, downsizing, and degazetting protected areas are keyways in which this is done. For example, the boundaries of the Selous (now Nyerere) Game Reserve in Tanzania, a UNESCO World Heritage site, were amended in 2012 to allow uranium mining in a wildlife corridor between Tanzania and Mozambique (McKee, 2012^[84]). Similarly, a number of Namibia's most notable uranium mines are located either within or close to the Namib-Naukluft National Park (El Obeid, 2021^[85]). While the challenge of extractive projects within natural World Heritage sites is a global issue, Africa has a greater occurrence of this than any other region, with some 45% of African sites exposed to extractive projects (UNESCO; Church of England Pensions Board; Greenbank; International Union for Conservation of Nature; World Wide Fund for Nature, 2025^[86]). Evidence suggests that mining areas in sub-Saharan African countries have 47.5% higher rates of deforestation than non-mining areas (Ahmed et al., 2025^[87]). The indirect deforestation to make way for mining communities to live is 28 times larger than the area cleared directly for mining (Ladewig et al., 2024^[88]). Illegal land grabs also become a prevalent issue in the wake of mineral deposits being identified. Among African countries, Ghana has the highest rate of mining-related deforestation on the continent (Stanimirova et al., 2024^[89]).

Water scarcity. Mining operations have high water consumption requirements, with water generally being sourced from local water bodies, reducing its availability for local community needs, such as irrigation of agricultural crops. This is a particular problem for mining in Africa, as the continent is one of the driest in the world, with around 45% of its landmass being classified as dry lands (and around 40% of these dry lands constituting hyper arid or desert land) (Kigomo, 2003^[90]). As a result, many of Africa's mineral-rich countries in the Sahel, Horn of Africa, and Southern Africa are very susceptible to rainfall variability, drought, and groundwater depletion – a situation further aggravated by Africa's notable vulnerability to climate change. Ascertaining whether sufficient water resources exist for a proposed mining project now precedes pre-feasibility studies in many African contexts, reflecting the reality that the water required for mine development is often simply not available (African Mining Market, 2024^[91]). In some instances, such as Namibia, mining projects are mandated to use only desalinated sea water and also provide potable water for local communities.).

Poor mine closure and rehabilitation practices. Mine closure and rehabilitation are particular issues in many African countries, caused by mining companies not always being required or failing to set aside upfront funds for rehabilitation and governments failing to enforce legal obligations, including due to corruption (Dambe, 2020^[92]). In South Africa alone, there is an estimated 6000 abandoned coal mines in need of rehabilitation, many of which pose environmental and physical hazards for local communities (African Business, 2022^[93]). Increased attention is being paid globally to proper mine site restoration, evidenced by the December 2022 launch of the first global standards for mine site restoration, the International Principles and Standards for the Ecological Restoration and Recovery of Mine Sites (Mine Site Restoration Standards, MSRS), aimed at driving more holistic ecological recovery at mining sites (Society for Ecological Restoration, 2022^[94]).

3.4. Continental and regional frameworks

As outlined above, the African Mining Vision embodies the continent's aspiration to transform its resource wealth into broad-based, equitable, and sustainable development, calling for transparent and equitable benefit-sharing, diversification of economies beyond raw extraction, and the integration of mining into national industrialisation strategies. However, despite rhetorical commitment, implementation has often been inconsistent.

Regional mechanisms have also advanced African leadership in responsible sourcing. The ICGLR's Regional Initiative against the Illegal Exploitation of Natural Resources (RINR) and the Lusaka Declaration (2010) institutionalised due diligence approaches and certification schemes for conflict-affected minerals. These frameworks, developed in collaboration with the OECD and multiple African governments, demonstrate how regional cooperation can anchor responsible supply chains. In parallel, the Extractive Industries Transparency Initiative (EITI) and the Voluntary Principles on Security and Human Rights have expanded across the continent, with 23 African countries now implementing EITI standards. The Voluntary Principles are a multi-stakeholder initiative guiding extractive industries to align security practices with human rights.¹² Several African countries are advancing in-country implementation such as the DRC and Mozambique which are 'engaged members,' while Ghana is a government member. These initiatives promote greater disclosure of payments, contracts, and security practices, helping to build public trust and reduce opportunities for corruption.

Yet, despite these achievements, implementation challenges persist. Many African institutions lack the technical and financial capacity to enforce due diligence obligations or to monitor cross-border mineral trade effectively. In some countries, overlapping responsibilities between ministries or weak decentralisation structures lead to gaps in oversight. The effectiveness of RBC frameworks therefore depends not only on normative alignment but also on sustained investment in governance capacity and institutional coordination.

The increasing deployment of technological tools to support due diligence and traceability is an encouraging development. In specific contexts, blockchain, digital ledgers, and artificial intelligence can enable near real-time tracking of minerals from extraction to export, reducing opportunities for fraud and illicit trade. However, these new tools also raise new challenges. Digital traceability requires significant infrastructure investment, technical expertise, and reliable data systems – capacities often limited in fragile settings. For ASM, which often operates outside formal systems, the digital transition can deepen exclusion. Without targeted support, the shift to high-tech traceability may privilege multinational companies while marginalising the very communities most in need of inclusion.

Tech-driven traceability must therefore complement inclusive governance. Effective implementation depends on strengthening customs capacity, expanding access to finance for ASM operators, and fostering formalisation pathways that make digital systems beneficial rather than punitive.

3.5. Implementation and verification challenges

As mentioned above, RBC recommendations and standards are well acknowledged across the continent, in particular in countries in the Great Lakes Region. To enable the implementation of international and regional expectations on due diligence, transparency and accountability, global private sector led initiatives have been deployed in several African producing countries. However, verification remains uneven across the continent and major gaps persist in ensuring that production and trade of mineral resources meet responsible sourcing expectations. Multi-tiered supply chains involving informal intermediaries complicate due diligence implementation, which can become overly costly and technically demanding.

Durable progress requires an integrated approach combining legal enforcement, community development, and responsible market incentives. Capacity building for African customs and mining agencies, harmonisation of regional certification schemes, and sustained donor engagement are critical. Local communities should be seen not merely as beneficiaries but as co-regulators – actors with the knowledge and agency to ensure that RBC translates into tangible improvements in livelihoods and governance.

The evolution of RBC in African contexts demonstrates that responsible sourcing is both a developmental and a governance challenge. It demands an approach that balances ambitious expectations with practicality, enforces human rights without undermining livelihoods, and strengthens African agency within global governance systems. The success of RBC depends not only on compliance but also on building trust between companies, communities, and governments.

Inclusive, multi-stakeholder approaches that align global norms with local realities are essential. This requires investment in domestic regulatory capacity, partnerships for transparency, and traceability systems designed to empower rather than exclude. Emerging technologies offer powerful tools for transparency, but they must be deployed ethically, inclusively, and with safeguards against data misuse and inequality.

Continued collaboration between the European Union, OECD, African Union, and African regional organisations will be crucial to developing context-appropriate models that integrate responsible sourcing with industrialisation and value addition. Ultimately, implementation of RBC in Africa must move beyond compliance to embrace meaningful due diligence, with a view to supporting economic resilience, and peacebuilding. If effectively implemented, RBC can transform Africa's mineral wealth from a source of fragility into a foundation for quality investments and long-term economic growth.

4 Trade policy, global markets and value chain integration

4.1. Agreements governing trade of African minerals

Several trade agreements shape global trade of critical minerals in different ways, including key World Trade Organisation agreements: the General Agreement on Tariffs and Trade (GATT), the Agreement on Trade-Related Investment Measures (TRIMS), and the Agreement on Subsidies and Countervailing Measures (SCM). The operation of Bilateral Investment Treaties (BITs) is also notable, although African countries do not appear to have more BITs in force than other countries. Trade arrangements that have unique impacts on African countries include the Africa Continental Free Trade Agreement (AfCFTA) (as well as the trade arrangements of various regional economic communities within the continent, such as the Southern African Development Community (SADC) Trade Agreement and the Customs Union Protocol and Common Market Protocol of the East African Community (EAC), the US' African Growth and Opportunity Act (AGOA), and China's recent duty-free arrangement with African countries.

4.1.1. African Continental Free Trade Agreement (AfCFTA)

The AfCFTA and other African initiatives aim to enhance intra-African trade, support value addition, and strengthen regional value chains on the African continent. Although AfCFTA is a trade agreement, it offers a route toward greater regional integration through improved trade facilitation, potentially encouraging intra-African trade of mineral resources and development of regional mineral value chains by, for example, removing tariffs on cross-border sales of mineral products. Theoretically, this could make it comparatively cheaper to sell mineral products to processing facilities in African countries than to buyers overseas. However, achieving this will require significant investment in cross-border trade infrastructure as well as regional cooperation on mineral processing and value addition. Ambitions are high but implementation has lagged and progress on increasing African value addition has been hampered by unfavourable global market conditions and difficulties competing against established processors, especially in China, who benefit from cheaper finance and subsidised electricity.

4.1.2. African Growth and Opportunity Act (AGOA)

AGOA is a trade preference programme under which the US has extended duty free, quota free access to the US market for selected products from eligible African countries since 2000, including mineral products. The AGOA Extension Act was passed by the House of Representatives in January 2026 (Ford, 2026^[95]) providing a temporary extension to 31 December 2026. As before, eligibility of African countries remains conditional, with the US able to suspend African countries from the programme in response to instances of political instability and human rights violations, an aspect that introduces uncertainty and unpredictability for African beneficiaries.

4.1.3. China's tariff free access initiative

In 2025, China announced that it would eliminate tariffs on all imports from African countries (excluding Eswatini due to its diplomatic recognition of Taiwan). This represents an extension of China's previous tariff free programme, which had applied only to African LDCs, making a more comprehensive – and less conditional – trade offer to African countries than extended by either the US or EU.

4.2. Trade restrictions on critical mineral exports imposed by African countries

African countries have imposed several different restrictions (notably, export bans, quotas, and levies) on the export of unprocessed mineral ores in recent years.

4.2.1. Export bans

In relation to the minerals included in this study, the following bans on the export of unprocessed minerals have been implemented:

- Tanzania – copper and nickel (March 2017) (Koigi, 2017^[96]).
- Zimbabwe – raw lithium (December 2022), with planned ban on lithium concentrates to start in 2027 (Banya, 2022^[97]).
- Namibia – critical minerals (not including uranium) (June 2023) (Nyaungwa, 2023^[98]).
- Ghana – raw lithium (June 2023) (Atta, 2023^[99]).
- DRC – cobalt (February 2025) (Mining Technology, 2025^[100]).
- Malawi – all raw materials, including graphite (October 2025) (Adeyemi, 2025^[101]).
- Gabon – manganese (planned to start 2029) (Africanews and Associated Press, 2025^[102]).

Apart from DRC's cobalt ban, these export bans align with the most common motivation behind export bans: to enforce more local mineral processing. These bans form part of African countries' efforts to retain a greater share of the value of their mineral wealth. The adoption of export bans has often come after years of wrangling between host governments and mining companies over local processing, with mining companies having resisted voluntarily efforts due to, for example, higher costs of local processing compared to established larger-scale facilities elsewhere (e.g., due to higher electricity or transport costs) and mineral processing being beyond the core competency of most mining companies.

DRC's cobalt ban is unique in that it was not implemented primarily to enforce local processing (although it is hoped that it will contribute to this), but rather as a temporary measure to restrict global supply to shore up cobalt prices, which had slumped to historically low levels due to supply exceeding demand. By October 2025, cobalt prices had more than doubled since the embargo started in February 2025 (Houenou, 2025^[103]). DRC's notable market share of cobalt production – at around 76 percent of global supply – enables it to attempt to influence global prices in this way (Mineral Resources Program, 2025^[48]). This is an option not available to the vast majority of producing countries, who tend to be more minor global suppliers.

4.2.2. Export quotas

Export quotas for unprocessed minerals have been used less frequently than export bans, although they are used in other extractive sectors, including timber in countries such as Gabon. They can serve different purposes to export bans, comprising a more sustainable mechanism to control supply (and therefore prices) for countries with the global market share that empowers them to do this, and they can be used to enforce more moderate extraction rates as part of environmental conservation or responsible resource

management strategies. They are also seen to encourage local value addition as constraints only apply to exports, not to local industry.

DRC converted its temporary cobalt export ban to a quota regime in October 2025, capping annual exports at 96,000 tonnes for 2026 and 2027 (Africanews and Reuters, 2025^[104]). This is intended primarily to constrain global supply over a longer term to keep cobalt prices higher than they would be without such constraints. Such a regime is complex to implement and there are concerns that it will create significant opportunities for rent-seeking and corruption through discretionary application and give rise to prolific smuggling to circumvent restrictions (Kedem, 2025^[105]).

4.2.3. Export levies

Rather than restricting exports, some countries impose export levies on exports of unprocessed minerals to encourage (rather than mandate) local processing. Examples of African countries that have adopted export levy regimes include:

- Zambia – a 15% export levy is imposed on the export of unprocessed minerals (Kambole and Kambani, 2019^[106]).
- South Africa – adoption of a 25% export tax for raw chrome is under consideration (Hidayat, 2025^[107]).

Whether export levy regimes are impactful depends on how rigidly they are enforced – where mining companies can easily secure waivers, it creates scope for discretionary application and corruption. In Zambia, mining companies frequently apply to the Ministry of Finance for export levy waivers, claiming that there is insufficient domestic processing capacity or inadequate and costly electricity, claims are difficult for the government to verify at any point in time (Zambia Revenue Authority, 2024^[108]). Waivers are often granted, undermining efforts to enforce more local processing.

As quantitative restrictions, export bans and quotas are technically not permitted under WTO rules unless an exemption is met. Export restrictions impact the domestic mining sector of producing countries in several ways. First, they lower export volumes, which impacts export earnings and government revenues from the sector. Second, they can push down domestic mineral prices to below international prices (due to lower demand domestically), which benefits local processors who can buy mineral inputs more cheaply, but harms mining companies. This can cause mining companies to disinvest from a country's mining sector over time, particularly if local market conditions are not conducive to undertake local mineral processing or value addition. Third, such restrictions can also prompt technological innovations away from minerals subject to export restrictions or other supply chain risk – this is currently being seen in battery developments away from cobalt.

4.3. Limitations to African participation in global mineral value chains

Trade restrictions – both those imposed by African producers and those applied against them – significantly affect their ability to participate fully in global value chains. When African countries impose export restrictions, they often undermine the development of regional value chains for mineral processing and value addition. If each producer attempts to establish its own processing capacity, the result is fragmented value chains, excess capacity, and facilities that struggle to achieve the economies of scale needed to compete with established processors. Such uncompetitive facilities are unlikely to attract investment or deliver the developmental benefits governments seek. By contrast, regional processing hubs that source ore from multiple countries can operate at greater scale and are more likely to be cost-competitive – but export restrictions and protectionist policies hinder the regional cooperation required for successful mineral processing in Africa.

Importing countries also apply trade restrictions on minerals and mineral-based products from African producers, further limiting their ability to integrate into global value chains. These restrictions can take several forms, including those outlined below.

4.3.1. Import tariffs

Import tariffs make it more costly for African producers to sell their products in certain markets, thereby raising barriers to trade. Consuming countries often apply import tariffs to protect their own domestic industry from foreign competitors. For example, the EU imposes 25% tariffs on steel imports (with plans to raise this to 50%) as a measure to protect Europe's steel industry from foreign competitors, locking out African steel producing countries, such as South Africa and Egypt (Payne, 2025^[109]).

Exporters from developing countries tend to face higher tariffs on intermediate or final products than on raw materials, which are often exempted from tariffs as they are needed by industry in consuming countries. This practice is known as 'tariff escalation' and it disproportionately affects exports from developing economies, making their products less competitive in global markets, thereby discouraging investment in value addition in developing countries (UNCTAD, 2025^[27]). Tariff escalation operates as a structural barrier to industrialisation and development in least developed countries, hindering investment in manufacturing and locking African countries out of more advanced stages of global value chains (UNCTAD, 2025^[27]).

4.3.2. Other unilateral tariff measures

Other unilateral tariff measures, such as the EU's Carbon Border Adjustment Mechanism (CBAM) also impact African producers. CBAM will require European importers to pay for the carbon emissions generated in the production of imported products, applying similar carbon pricing mechanisms to imports as to products manufactured within the EU. By levying tariffs on imported products produced using fossil fuel-fired electricity, CBAM raises the barrier of entry to the EU market for some African producers. This will have a significant impact on countries like South Africa, which relies on coal to generate around 82% of its electricity and whose iron and steel industries will face higher tariffs under CBAM (IEA, n.d.^[110]).

4.4. Global trade policies: disadvantages to African producers, benefits to global markets

Beyond tariff regimes that protect industry in developed countries and operate to make exports from Africa and other developing regions uncompetitive (especially final consumer products) several trade policies also serve to disadvantage African producers while benefiting international corporations and consumer markets. BITs and WTO rules are two prime examples.

4.4.1. BITs

BITs essentially operate to prevent host governments from making any changes to regulatory or fiscal frameworks that do not favour investors, thereby hindering host governments' policy space and their ability to safeguard national interests. Older BITs signed in the 1980s and 1990s often favoured investors' rights over issues such as sustainability, local value addition, and social rights (Tossou, 2025^[111]). Mining companies have won significant compensation settlements against African countries when host governments have tried to revise their mining laws. An example is the International Centre for Settlement of Investment Disputes (ICSID) 2023 ruling in favour of a British nickel miner against the Tanzanian government, based on a 1994 UK-Tanzania BIT, which case was initiated after the Tanzanian government revised its mining code (Nachingwea and others v. Tanzania).

Host governments face much resistance when trying to revise terms of BITs – as a result, producing countries are increasingly resorting to cancelling BITs to give themselves more policy space to pursue national priorities. For example, Indonesia cancelled its BITs so that it could enforce its nickel ore export ban, and South Africa has replaced outdated treaties with national laws of general applicability (Tossou, 2025^[111]).

4.4.2. WTO rules

GATT, TRIMS and SCM raise myriad obstacles to producing (developing) countries attempting to, for example, establish domestic mineral-based industries, to require mining companies to procure a share of their goods and services locally, or to control the rate of extraction or export of their minerals. While WTO rules supposedly advance ‘free trade’, their construction and implementation tend to favour consuming (advanced) countries and international corporations over producing countries attempting to develop local industry or better control extraction rates of their mineral wealth. For example, export restrictions almost always fall foul of WTO rules and producing countries have rarely satisfied the criteria needed for an exception to apply (as such criteria thresholds are notably high). A case in point was seen with Indonesia’s attempt to use an export ban on unprocessed nickel to enforce more sustainable extraction rates and establish a local stainless-steel industry – Indonesia’s interests were overruled in favour of EU claims that the European stainless steel industry would be adversely affected. International trade rules operate against African industrial ambitions and coming years may see African countries’ export restrictions challenged at the WTO, with outcomes unlikely to be in favour of African interests.

5 Conclusions and recommendations

Africa holds significant critical mineral resources, many of which remain unmapped or underexplored. Demand for cobalt, copper, graphite, lithium, manganese and nickel is expected to rise with the digital and green transitions, defence needs and advanced manufacturing. Yet Africa accounts for only around a tenth of global critical mineral exports, most of which leave the continent raw or semi-processed.

This gap between resource endowment and economic benefit reflects constraints in exploration, governance, infrastructure, finance, skills and market access, compounded by international trade and investment rules. The challenge is not simply to extract more minerals, but to capture a greater share of the value they generate. The current mineral boom offers an opportunity to address these constraints, but doing so requires coordinated action by African governments, regional institutions, international partners and supply chain actors.

5.1. Main conclusions

Gaps in knowledge and governance weaken countries' bargaining position. Africa receives a small and declining share of global exploration spending, much of it concentrated in gold. Under-resourced geological surveys and gaps in reliable data can weaken governments' negotiating positions. Opaque contracts, limited competition in licensing and weak tax enforcement further constrain public revenues, with many mineral-rich countries reportedly collecting only around 40% of their potential revenues.

Value addition is held back by missing foundations rather than lack of ambition. Processing and manufacturing remain concentrated outside Africa, reflecting constraints in electricity, transport, finance, skills and economies of scale. Export bans, quotas and levies may support domestic processing objectives, but their effects depend on local conditions and implementation. Where competitive alternatives are lacking, such measures can reduce export earnings, deter investment and encourage informal trade. Regional approaches offer opportunities to pool resources, expand markets and develop processing capacity at a viable scale.

Responsible business conduct is a precondition for quality investment. Environmental damage, labour and human rights abuses, and links between mineral trade and conflict remain significant concerns, particularly in fragile contexts. African countries have developed important frameworks to address these risks, including through the ICGLR, although implementation and verification remain uneven. Due diligence and traceability requirements also need to account for local production structures: approaches that exclude artisanal producers can undermine livelihoods and shift trade into less transparent channels.

The international environment both constrains African producers and gives them leverage. Tariff escalation, carbon border measures, older bilateral investment treaties and WTO rules on export restrictions can affect African countries' efforts to develop processing and manufacturing. At the same time, competition among China, the European Union, the United States, Gulf states and other partners creates opportunities for African governments to negotiate arrangements that reflect their development priorities. To date, however, international engagement has focused largely on securing mineral supplies, with less investment in processing, infrastructure and industrial capabilities within Africa.

5.2. Recommendations

5.2.1. For African governments

- **Strengthen geological knowledge and data systems.** Modernise national geological surveys, digitise existing records, develop technical expertise and adopt harmonised classification and reporting standards such as AMREC–PARC. Use improved data to inform licensing, investment decisions and national development strategies.
- **Enhance transparency and accountability in licensing and contracts.** Expand competitive bidding where appropriate, strengthen due diligence on applicants, publish contracts and beneficial ownership information, and deepen implementation of the EITI. Improve alternative dispute resolution mechanisms to address land and mining conflicts more efficiently.
- **Design fiscal regimes that balance public revenues and investment.** Combine royalties, corporate income tax supported by effective audit capacity, and resource rent taxes to capture windfall profits. Align incentives with national development priorities, including processing and downstream activities, and provide predictable rules supported by transparent assessments of costs and benefits.
- **Align industrial policy with national priorities and market conditions.** Integrate critical minerals strategies into national development plans. Before introducing export restrictions or other measures to encourage domestic value addition, assess whether processing capacity, energy, infrastructure, finance and market demand are sufficient to support them. Where such measures are adopted, apply them transparently and predictably. Develop local supplier capabilities in engineering, logistics and services alongside employment opportunities.
- **Support the formalisation of artisanal and small-scale mining.** Develop context-specific approaches that expand legal recognition, access to finance, occupational safety, environmental support and participation in formal supply chains.
- **Strengthen environmental protection and community participation.** Ensure that mine closure and rehabilitation are adequately funded and enforced, protect sensitive areas, assess water availability and involve affected communities in decisions throughout the mining cycle.

5.2.2. For regional and continental institutions

- **Expand regional value chains through the AfCFTA.** Improve trade facilitation, address tariff and non-tariff barriers in line with AfCFTA commitments, and invest in cross-border infrastructure that supports intra-African trade in mineral products.
- **Coordinate regional industrial development.** Explore opportunities for processing hubs that serve multiple countries and connect mineral-producing areas to corridors such as Lobito, TAZARA and Walvis Bay. Improve coordination on investment incentives to limit costly competition and support viable regional markets.
- **Promote regulatory cooperation and compatible standards.** Build on the Africa Mining Vision, the African Green Minerals Strategy and the ICGLR Regional Initiative against the Illegal Exploitation of Natural Resources to improve consistency across regulatory, fiscal and certification frameworks while accounting for national circumstances.

5.2.3. For international partners and consuming economies

- **Match supply partnerships with investment in value creation.** Complement offtake agreements with investment in processing, infrastructure, energy and skills. Use blended finance

and risk guarantees to support commercially viable projects and strengthen productive capacity in mineral-producing countries.

- **Ensure international frameworks support development objectives.** Assess the implications of trade measures, investment agreements and sustainable finance frameworks for value addition in Africa. Engage producing countries in addressing policy tensions between supply security, market access and industrial development.
- **Support institutional capacity in response to national priorities.** Provide sustained financing and technical cooperation for geological surveys, mining authorities and customs administrations, including in data management, contract negotiation, revenue collection, due diligence and traceability.

5.2.4. For companies and other supply chain actors

- **Apply due diligence in ways that support responsible engagement.** Design proportionate risk-based traceability systems that enable artisanal producers to participate in formal markets. Engage local communities and producer organisations in monitoring, accountability and the resolution of concerns.
- **Strengthen local economic linkages.** Expand local procurement where commercially feasible, invest in skills and supplier development, disclose payments to governments and provide for mine rehabilitation throughout the project cycle.

Africa's critical minerals offer an opportunity to strengthen productive capacity, expand regional trade and increase the economic value generated from the continent's resources. The extent to which this opportunity translates into lasting benefits will depend on how African countries define and pursue their development priorities, the effectiveness of regional cooperation, and the terms on which international partnerships are established.

Progress does not depend on a single policy instrument. It requires approaches that reflect different national circumstances while addressing shared constraints in infrastructure, finance, market access and industrial capacity. Regional cooperation can help achieve economies of scale, while international partners and companies have a role in aligning investment, trade and sourcing practices with value creation in producing countries.

Dialogue between mineral-producing and mineral-consuming economies, including through the OECD Critical Minerals Initiative, can help identify areas of mutual interest and address differences in policy priorities. The objective is not only to build resilient and responsible supply chains, but also to ensure that the countries supplying critical minerals can pursue their own development objectives and capture a greater share of the value generated by global demand.

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Notes

¹ See Figure 10 in UNCTAD, “Critical minerals_ Trade in critical minerals shapes energy transition, digital transformation and industrial development worldwide,” 26 June 2025, https://sdgpulse.unctad.org/critical-minerals/#Ref_5PK8SI37.

² 2021 is the last year for which production figures are available for all countries, not just the leading global producers covered in USGS’s annual Mineral Commodity Summaries.

³ Including suspended production following seismic activity and flooding at the Kakula mine in the DRC, a fatal collapse at the El Teniente mine in Chile, and a mudflow at the Grasberg mine in Indonesia. Andy Home, “Copper Study Group highlights impact of supply hits,” Reuters, 27 October 2025, <https://www.reuters.com/markets/commodities/copper-study-group-highlights-impact-mine-supply-hits-2025-10-24/>.

⁴ Authors’ calculations based on International Energy Agency, 2025, <https://www.iea.org/data-and-statistics/data-tools/critical-minerals-data-explorer>.

⁵ Authors’ calculations based on International Energy Agency, 2025, Announced pledges scenario <https://www.iea.org/data-and-statistics/data-tools/critical-minerals-data-explorer>.

⁶ US Department of the Interior/USGS Geological Survey, “Mineral Commodity Summaries 2025,” Version 1.2, March 2025, p. 111, <https://pubs.usgs.gov/periodicals/mcs2025/mcs2025.pdf>. Note that there is a significant discrepancy with the World Bank report, where Africa is reported to represent 15.9 % of total world reserves. The reason for the discrepancy might be that the USGS report does not account for the announced resources/reserves in DRC, expected to be very large. See World Bank, “Mineral Resources of Africa,” 15 October 2025, pp. 104-105.

⁷ Authors’ calculations based on International Energy Agency 2025, announced pledges scenario <https://www.iea.org/data-and-statistics/data-tools/critical-minerals-data-explorer>.

⁸ The USGS database largely used for data in this report did not provide any data on Africa’s nickel production. USGS Mineral Commodity Summaries only include data for the top 10 to 15 global producers of each mineral, and no African country makes it to the top. We used instead the British Geological Survey (N.E. Idoine, et al., 2025) for production data and the World Bank and Nickel Institute for reserves and resources.

⁹ Authors’ calculations based on International Energy Agency, 2025, Announced pledges scenario <https://www.iea.org/data-and-statistics/data-tools/critical-minerals-data-explorer>.

¹⁰ For more analysis, see Africa Policy Research Institute (2026), A guide to the African Green Minerals Strategy (AGMS), <https://afripoli.org/projects/factsheet/au-crm/>.

¹¹ For detailed analysis, see Farooki, M. (2025).

¹² See Voluntary Principles on Security and Human Rights, <https://www.voluntaryprinciples.org/>.

Critical minerals in Africa

A regional overview

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This policy paper examines Africa's current and potential role in critical mineral supply chains and identifies policy recommendations for African countries to leverage their minerals endowments for their development objectives. It focuses on six minerals: cobalt, copper, graphite, lithium, manganese and nickel. The report provides an assessment of the opportunities and policy challenges associated with Africa's growing role in global critical mineral supply chains. It aims to support African governments, development partners, investors and other supply-chain actors in identifying policy approaches that can strengthen resilience, promote responsible investment and increase the domestic value generated from Africa's mineral resources.