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Critical public policy issues

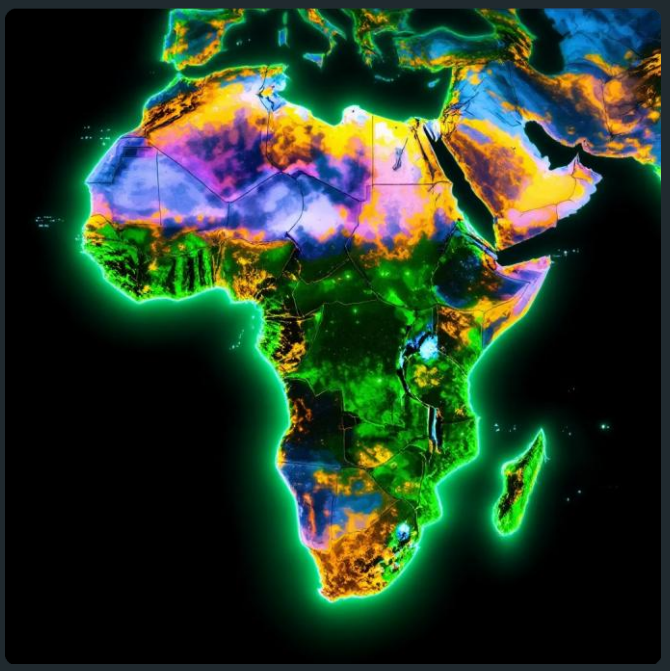
Reimagining mineral wealth in Africa

1. Introduction

Africa holds approximately **30%** of the world's critical mineral reserves. Among them are minerals essential to the global defense sector, aerospace and green energy supply chains, such as titanium, graphite, lithium, beryllium and rare earth elements (REEs). Equally vital are gallium, germanium and silicon, which serve as key inputs for **semiconductor** manufacturing that underpin the Artificial Intelligence (AI) revolution and the rapid growth of global data infrastructure.

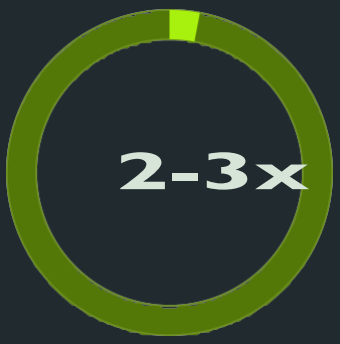
As of mid-2025, Africa's mining sector faces a complex array of challenges that intersect with governance, environmental sustainability, human rights, and geopolitics. The demand and supply of critical minerals, such as nickel, graphite, manganese, cobalt, copper, and lithium, currently occupies a central role in global economic and geopolitical competition. Demand for these minerals is projected to skyrocket over the coming years, driven primarily by increased demand for renewable energy and electric mobility technologies.

Depending on specific modelling assumptions employed, it is estimated that overall mineral demand will increase by a factor of between two and three by 2030 and continue to rise through 2050. Securing supplies will remain key as well. Global powers are racing to secure access to these critical minerals. Geopolitical dynamics, such as the US-China trade war, are reshaping investment flows and strategic priorities. Today, the conversation is not only about possessing critical mineral reserves. Here's an overview of the most pressing issues:



Global Reserves

Africa's holds a 30% share of world's critical mineral reserves such as titanium, graphite, lithium, beryllium, gallium, germanium, silicon and rare earth elements (REEs)



Demand Growth

Projected increase in mineral demand by 2030 is being driven by geopolitical competition for renewable energy, and electric vehicles

1. Governance and Regulatory Instability

Several African nations are revising mining laws to assert greater control over their resources. In Mali, for example, a dispute over a new mining code led to the suspension of Barrick Gold's Loulo-Gounkoto complex and a halt in gold exports. The government has sought to appoint a provisional administrator, while Barrick has initiated international arbitration.

Similarly, military regimes in the Sahel region, including Mali, Niger, and Burkina Faso, are nationalizing mining operations and detaining foreign executives. For example, Burkina Faso is advancing its gold sector by constructing its first gold refinery, aiming to add value domestically and curb illicit exports. Additionally, the government has suspended export permits for small-scale gold production to combat smuggling and enhance regulatory compliance. These actions aim to reclaim sovereignty over critical minerals but have disrupted operations and deterred investment.

Nationalization

Mali, Burkina Faso and Niger are nationalizing operations. The government of Burkina Faso has suspended export permits for small-scale gold production to combat smuggling and enhance regulatory compliance

A notable diplomatic development is that of the DR Congo when it reportedly proposed a **Ukraine-style** deal to the US, offering access to its vast mineral wealth in return for support in resolving the long-standing conflict in eastern Congo. Such minerals-for-security arrangements may appear mutually beneficial, but come with serious governance **risk**. If not accompanied by transparency and accountability, they risk further entrenching corruption and triggering instability in fragile states. Overall, African countries have entered into **approximately 100** bilateral and multilateral agreements between 2019 and 2023, as assessed by the Africa Policy Research Institute. Many of these agreements, however, vary strongly in the criteria they define and lack transparency and public accessibility. This raises serious concerns from the perspectives of governance, benefit-sharing, human rights, and more.

2.Environmental Disasters and Pollution

Unregulated mining tends to drive people away from sustainable livelihoods, for instance, farming to other livelihoods - such as panning - which may result in possible destruction of productive land resources. Such alternative changes lead to further destruction of the environment and expose people's livelihoods to unsustainable risk. Countries like Zambia and South Africa are implementing stricter environmental management plans and adopting innovative technologies to improve productivity and safety, aligning with global sustainability trends However, some negative environmental impacts may persist for hundreds of years.

Livelihood Disruption

Mining may drive people away from sustainable livelihoods like farming, resulting in destruction of productive land resources

Ecosystem Damage

Loss of flora and fauna, destabilizing ecosystems due to contaminated water, soil, and habitat loss

Long-term Impact

Some negative environmental impacts such as deforestation and acid mine drainage may persist for hundreds of years

Zambia Dam Collapse

In February 2025, a tailings dam collapse at a Chinese-owned copper mine in Zambia released approximately 50 million liters of toxic waste into the Kafue River, affecting over 12 million people. The spill caused mass fish mortality and destroyed crops, highlighting concerns over foreign mining practices and environmental negligence.

Ghana's "Galamsey" Crisis

In Ghana, illegal small-scale mining, known as "galamsey," continues to cause deforestation, water pollution, and soil erosion. The unregulated use of hazardous chemicals like mercury and cyanide exacerbates these environmental issues.

Senegal's Mercury Problem

In Senegal's Kedougou region, informal gold mining relies heavily on mercury, posing severe health risks. Despite the country's commitment to eliminating mercury use, progress has been slow due to limited resources and enforcement challenges

3. Human Rights Violations and Child Labor

Mining companies and their stakeholders, including investors, governments and politicians, must confront human rights abuses that are rife in industry. Child labour remains prevalent in Africa's mining sector. In Nigeria, children work in illegal lithium mines under hazardous conditions, earning less than a dollar a day. Despite laws prohibiting child labour, enforcement is challenging due to corruption and the remote location of many mines. This exploitation is driven by the booming demand for lithium, essential for battery production.

DRC Child Labor

In the Democratic Republic of Congo (DRC), over 40,000 children are involved in artisanal mining of cobalt and other minerals used in electronics. These children often work in dangerous conditions, leading to injuries and deaths.

Mozambique Flooding

In Mozambique, Amnesty International exposed how a mining operation, by a Chinese multinational corporation Haiyu, likely contributed significantly to a flash flood in 2015 in the village of Nagonha, which destroyed 48 homes and left 290 people homeless.

1 2 3 4

Marikana Tragedy

In South Africa, **victims of the bloody tragedy at Marikana**, in which 34 protesters were killed and at least 70 injured by members of the South African Police Service (SAPS) during a mining strike in August 2012, are still awaiting justice almost thirteen years on.

DRC Cobalt Mining

In the Democratic Republic of the Congo, **research** on cobalt mining revealed the human rights risks associated with unregulated or poorly regulated artisanal mining, including dangerous working conditions for miners and child labour.

4.Artisanal and Small- Scale Mining (ASM) Challenges

ASM is a significant source of livelihood for many Africans but is often informal and unregulated. Estimates ranging from 130 to 270 million Africans are in the ASM sector. Across Africa, artisanal miners face unsafe working conditions, including exposure to toxic chemicals, lack of protective equipment, and risk of tunnel collapses.

These miners often lack legal recognition, making them vulnerable to exploitation and accidents. This informality leads to environmental degradation, poor safety standards, and exploitation by armed groups. Efforts to formalize ASM have been hindered by complex licensing processes and lack of support for miners.

Livelihood Source

130-270 million Africans depend on ASM for income including through trade, services and food supply chains. In Sun – Saharan Africa alone, 12.2 million people rely on ASM.

Legal Challenges

Lack of recognition and complex licensing processes

80%

Informality

The percentage of ASM operations remains unregulated. Many ASM activities occur on untitled or disputed land, making licensing and regulation difficult

30%

Women Miners

30% of women are estimated to be in ASM. Women often lack access to credit, mining rights, and equipment, confining them to low-paying, labor-intensive roles

5.Geopolitical and Trade Dynamics

Global Competition

African countries face pressure to align with either the U.S. or the China coalition

Resource Diplomacy

DRC proposed a Ukraine-style deal to the US, offering mineral access for security support

Resource Sovereignty

Countries exercising agency over mineral resources through nationalization and revised mining laws

Conflict Minerals

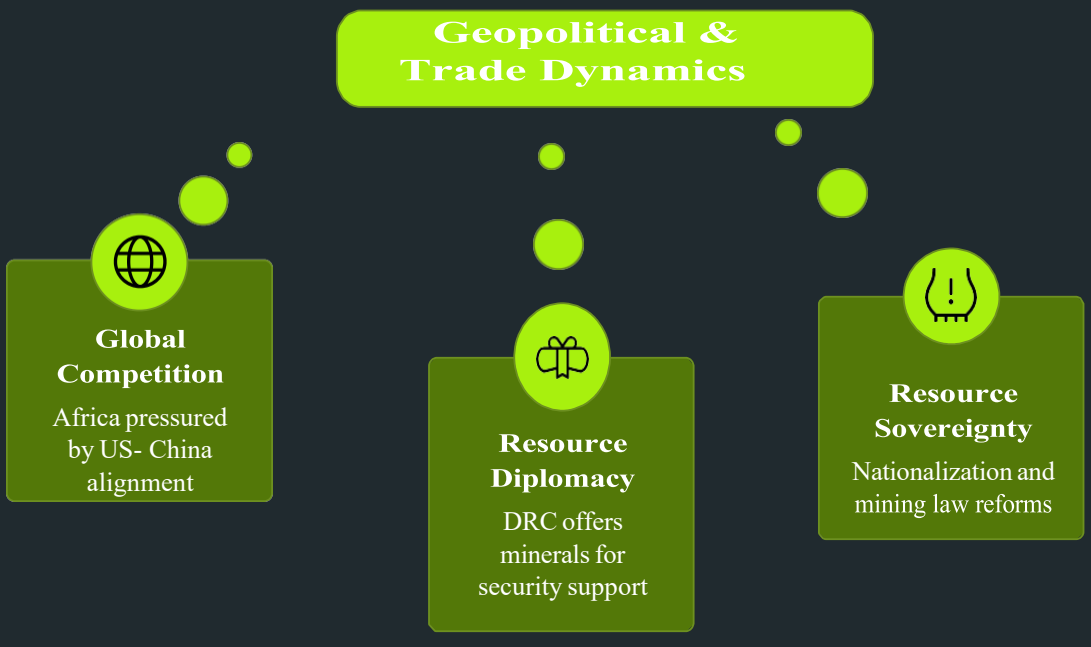
The Democratic Republic of Congo (DRC) continues to experience violent conflicts fuelled by its rich deposits of minerals like coltan and cassiterite. Armed groups and foreign interests vie for control, leading to displacement and human rights abuses.

In Mali, Barrick Gold suspended operations at its Loulo-Gounkoto complex following disputes over new mining codes that increase taxes and state ownership. The government seized gold stock and blocked exports, leading to a standoff and international arbitration.

Strategic Infrastructure

It is believed that Africa Finance Corporation (AFC) US$320 million deal with Italy to bolster the Lobito Corridor, enhancing infrastructure for transporting minerals like copper and cobalt from Zambia and the DRC to Angola's port, is aiming to reduce Chinese dominance in the regional supply chain.

In the Sahel region, countries like Mali, Niger, and Burkina Faso have seen governments nationalize mining assets, detain foreign executives, and revise mining laws to assert greater control over resources. These actions have disrupted operations and deterred investment.



6.Infrastructureand Investment Challenges

Despite Africa's vast mineral wealth, investors remain cautious due to perceived high-risk premiums associated with geopolitical instability, infrastructure bottlenecks and regulatory uncertainties. Only a small fraction of global mining capital is directed towards African projects, highlighting the need for improved investment climates and risk mitigation strategies.

5%

Global Investment

Fraction of global mining capital directed to African projects

40%

Cost Increase

Higher operational costs due to infrastructure challenges

1

Ghana's Logistical Challenges

Mining companies face significant logistical challenges due to inadequate transportation infrastructure. Delays in truck availability and high transportation costs hinder productivity and increase operational costs.

2

South Africa's Investment Decline

South Africa's mining sector has seen a decline in exploration investment, partly due to a cumbersome regulatory environment and infrastructure bottlenecks.

3

Zambia & Angola's Success

Countries like Zambia and Angola have attracted significant mining investments by streamlining processes and offering more favourable conditions

7.Value-addition and beneficiation

African countries are seeking to support their industrialization by producing midstream products. The approach to value addition must progress in phases, beginning with segments of the value chain that are commercially and industrially viable, rather than leaping directly into advanced manufacturing. Cultivating this ecosystem will require a deft touch. Standard tax breaks to encourage investment may be useful, but they will not be a panacea. Ensuring downstream offtake arrangements can help reduce risk, but securing sufficient upstream feedstock is equally important. While certain targeted trade restrictions may help galvanize development, blanket export bans alone risk cutting against the interests of mineral rich African countries by encouraging investors to seek other jurisdictions and incentivizing the development of substitutes.

Although there is scope for regional engagement with many African countries, there should also be flexibility in taking a bilateral approach in selective cases. For example, U.S. engagements with African countries should connect to existing national strategies and frameworks and not devolve into a one-size-fits all approach. Many African countries share similar goals with respect to developing their mineral value chains. However, the levels of industrialization, energy access, and transportation infrastructure vary widely across countries, and these variations must be considered when tailoring international collaborations. Moreover, what constitutes a "critical" mineral differs across countries and use cases for minerals change as technologies advance. Flexibility will be an important component of successful engagement, both across countries and over time.

8.Illegal Mining and Organized Crime

The growing demand for minerals is amplifying the risks of crime, corruption and instability in the mineral supply chain. In **Minerals Crime: Illegal Gold Mining**, part two of the **Global Analysis on Crimes that Affect the Environment**, the UN Office on Drugs and Crime (UNODC) examines the motivations driving diverse actors to engage in minerals crime, as well as the destinations of the unprocessed metals and minerals and the proceeds from their trade.

Organized crime groups and corporations as well as individual actors are involved in illegal gold mining and trafficking, the study finds. Organized crime groups have increasingly embedded themselves in gold supply chains, attracted by the sector's high profitability and the rising value of gold. Drug trafficking organizations in Latin America have expanded into illegal gold mining, taking advantage of established drug smuggling routes and infrastructure. Revenues from gold are then reinvested into other criminal operations. In Africa, however, some organized crime groups operate exclusively in gold, while others use gold profits to fund armed activity, challenge state authority or fuel conflict.

Actors involved in illegal mining and trafficking use fraud, corruption and money laundering to enable their crimes and bring illegally sourced metals and minerals into licit global markets. Organized crime groups, corporations, and traders like to exploit legal loopholes and weak regulatory oversight to conceal the origin of minerals and metals. They may bribe officials to obtain mining concessions or avoid legal consequences for violations, or forge permits and other documentation.

Environmental Impact

Use of banned chemicals, deforestation, and illegal waste dumping

Criminal Methods

Fraud, corruption, money laundering, and document forgery

South Africa Crisis

Stilfontein siege led to 78 deaths of illegal miners

Illegal mining is intensifying environmental damage, the study emphasizes, including via the use of banned or hazardous chemicals like mercury, deforestation to enable access to mineral deposits, and illegal dumping of solid waste. These practices, which bypass environmental regulations, not only degrade ecosystems and accelerate biodiversity loss but also pose serious threats to public health.

Even historically mining economies like South Africa suffer from illegal mining crisis instead of having strong institutions to combat criminality. In Stilfontein, South Africa, a siege of an abandoned gold mine led to the deaths of at least 78 illegal miners. The site, controlled by underground gangs, has become a hotspot for illicit mining activities, highlighting the

8.Technological Advancements and Digital Transformation

It is estimated that 40% of mining equipment on the continent will be self-driving by 2040 and many operations will be close to being fully automated. Countries are taking initiatives to use advances in technology and AI to enhance mining productivity. For examples, South Africa is integrating artificial intelligence (AI) and digital technologies into its mining operations. Companies like Anglo American and Gold Fields are leveraging AI and data analytics to enhance operational efficiency, with projections indicating a potential R213 billion (US $14.5 billion) value addition by 2026 Zimbabwe's Caledonia Mining is investing $1.1 million in IT infrastructure upgrades, including new software solutions for mine planning and labour efficiency, aligning with global trends in mining digitalization.

African Mining Vision

Established in 2009 as a continental blueprint for sustainable development

African Green Minerals Strategy

Recently approved by AU to promote beneficiation and responsible mining

40%

Self-driving Equipment

Projected percentage of autonomous mining equipment by 2040

$14.5B

Value Addition

Potential value from AI and digital technologies in South Africa by 2026

$1.1M

IT Investment

Zimbabwe's Caledonia Mining investment in IT infrastructure upgrades

9.Conclusion

The issues discussed above underscore the need for comprehensive reforms in governance, environmental management, labour rights, and infrastructure development to ensure that Africa's mining sector contributes to sustainable and equitable economic growth. The sectoral significance must be approached through collective African engagement to enhance bargaining leverage and project a unified continental position. As a result, there is an urgent imperative for the African Union (AU) to formulate a coordinated framework for negotiating and governing investments in critical minerals. At the heart of such a strategy must be value addition, transparent governance, and robust public-private partnerships (PPPs) that secure sustainable benefits for the continent.

The recently approved **African Green Minerals Strategy** (AGMS) by the AU seeks to advance this agenda. It establishes a continent-wide framework to promote mineral beneficiation, enforce responsible mining practices, and align Africa's vast mineral wealth with its broader ambitions for green industrialisation and sustainable economic transformation. The **African Mining Vision** (AMV), established in 2009, set out a continental blueprint to ensure mineral wealth contributes to broad-based sustainable development. Yet, the implementation of these frameworks and strategies has been very fragmented among African countries. These interconnected issues underscore the need for comprehensive reforms in Africa's mining sector, emphasizing environmental sustainability, human rights, transparent governance, and strategic international partnerships.