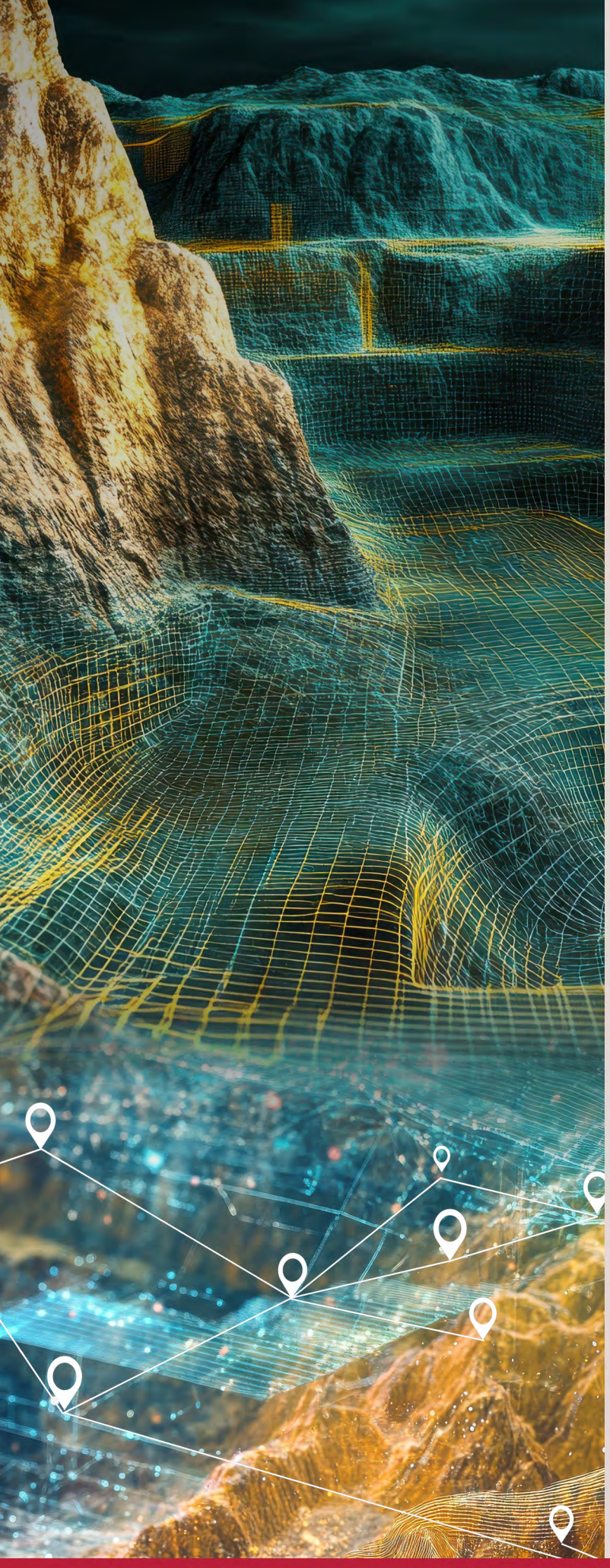

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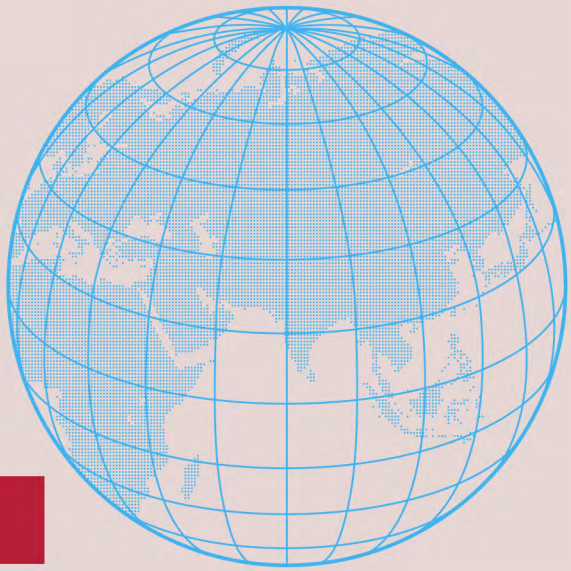
Beyond the Ore

India's Value-driven Critical Minerals Diplomacy in Africa

Veda Vaidyanathan



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Designed by Mukesh Rawat

Beyond the Ore

India's Value-driven Critical Minerals Diplomacy in Africa

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Abbreviations

AI	Artificial Intelligence
CHOGM	Commonwealth Heads of Government Meeting
CII	Confederation of Indian Industry
CMPDI	Central Mine Planning and Design Institute
COMESA	Common Market for Eastern and Southern Africa
DRC	Democratic Republic of the Congo
ESG	Environmental, Social, and Governance
EV	Electric Vehicle
EXIM Bank	Export–Import Bank
G-15	Group of Fifteen
GDP	Gross Domestic Product
GRID-INDIA	Grid Controller of India
GSI	Geological Survey of India
ICCR	Indian Council for Cultural Relations
ICT	Information and Communications Technology
IEA	International Energy Agency
IIDS	Integrated Industrial Development Strategy
IIT	Indian Institute of Technology
ISA	International Solar Alliance
ITEC	Indian Technical and Economic Cooperation
ITHP	Itezhi Tezhi Hydropower Project
KABIL	Khanij Bidesh India Limited
LoC	Line of Credit
MEA	Ministry of External Affairs
MoU	Memorandum of Understanding
NAM	Non-aligned Movement
NCMM	National Critical Minerals Mission
NRI	Non-resident Indian
OECD	Organisation for Economic Co-operation and Development
PIB	Press Information Bureau
PIO	Person of Indian Origin
PSU	Public Sector Undertaking
RE	Renewable Energy
SADC	Southern African Development Community
TMAA	Tanzania Minerals Audit Agency
TPDF	Tanzanian People's Defence Force
TriDEP	Triangular Development Partnership
ZIPAR	Zambia Institute for Policy Analysis and Research

Executive Summary

As global demand for critical, green or transition minerals accelerates, India is working to secure supplies to meet its industrial and energy transition goals. With over 30% of global reserves of these located in Africa, countries on the continent are central to New Delhi's effort.

This paper explores how India can deepen its engagement across Africa's critical minerals ecosystems by moving beyond transactional trade and concessional finance towards embedded partnerships grounded in institutional capacity building, technology transfer and shared value creation. Building on an earlier study, it identifies three practical entry points for India in an increasingly competitive geopolitical landscape. These include critical mineral workforce development, sustainable and responsible mining practices, and knowledge networks for mineral mapping, surveying, and geological collaboration.

However, the move from ambition to implementation is constrained by shared institutional and structural challenges. Massive infrastructure deficits, regulatory and policy uncertainty across various African mining jurisdictions, and intense geopolitical competition complicate long-term planning. Indian institutions and companies face operational and technical hurdles as they expand into new markets and expose mineral supply chains to disruption. To anchor India's mineral diplomacy in stable, long-term, and substantive partnerships, addressing these factors will be key.

Scope of the Study and Focus

This paper focuses on Zambia, Zimbabwe, and Tanzania, chosen for their existing engagement with India, their mineral endowments, and their relevance to global supply chains. While the themes explored have been matched to a particular country, they will also find resonance in other mineral-producing geographies.

The paper shifts the focus from identifying 'where' India should engage to examining 'how' such engagements can be operationalised through targeted policy instruments. The potential of joint geological surveying and knowledge networks in Zambia, the commercial logic for responsible mining practices in Zimbabwe, and opportunities for workforce development in Tanzania are analysed in depth. In doing so, the paper shows how India's ambitions in critical minerals are being translated, or constrained, by operational realities on the ground, with important implications for India's future role in global critical mineral supply chains.

These country-theme case studies not only underscore India's bilateral outreach but also serve as diagnostic tools to assess the strengths and weaknesses of its engagement in practice. With diverse regulatory environments and domestic political economies, along with the rise of resource nationalism across Africa, balancing India's commercial interests with the development priorities of the partner countries will require nimble policymaking, leveraging New Delhi's strengths.

The three case studies explored in the paper are as follows:

Zambia: Where and How Much? Resource Mapping as a Foundation for Copper Cooperation.

Zimbabwe: How to Mine Right and Why it Pays? Sustainability as a Strategy in Lithium Diplomacy.

Tanzania: Can Knowledge Power Value Chains? Capacity as the Cornerstone of Critical Mineral Cooperation.

Policy Pathways

In Zambia, India's focus could be on enhancing technical cooperation in geological mapping and early-stage exploration. Existing agreements, including the India–Zambia Technology Transfer Programme and the Joint Permanent Commission framework, provide a platform for operationalising Memoranda of Understanding (MoUs) and advancing concrete projects.

- To improve transparency, resource quantification, and investment certainty, co-developing digital mineral data repositories and facilitating technical exchanges between Indian and Zambian scientists could be undertaken.
- Cooperation can focus on strengthening Zambia's geoscientific infrastructure. A blueprint for a joint innovation hub for mineral-focused collaborations already exists with the Indo-Zambia bank, which is co-owned by the Zambian government (40%) and Indian state-owned banks (60%).

In Zimbabwe, Indian actors could accrue credibility by making responsible mining overseas a central tenet of their operations.

- In addition to aligning operations with global environmental, social and governance (ESG) standards, an India–Zimbabwe Sustainability Charter could be developed. This could establish benchmarks for the Indian industry, with incentives for working closely with local civil society organisations.
- Introducing pilot projects in low-emission mining technologies, mine-site rehabilitation, and setting up clean recycling or value-added processing near mining sites, which provides training for local communities, could further enhance the accountability of Indian firms.

Central to Tanzania's Vision 2030 strategy is the goal of boosting productivity and local value addition in the mining sector. Given Dodoma's long-standing educational and technical ties with New Delhi, India could play a substantive role in a core component of this aspiration—workforce development.

- The Indian Institute of Technology (IIT) Madras, which hosts the first overseas campus in Zanzibar, could be positioned as a regional hub for mineral education.
- Partnerships with local technical institutions could incorporate industry-linked internships and exchange programmes with national metallurgical labs in India.

The findings presented in this paper draw on extensive literature reviews, stakeholder consultations, dialogues, and workshops conducted across geographies. The evidence was triangulated to examine how India can enhance its credibility as a responsible actor in Africa's critical mineral supply chains.

In an increasingly complex global architecture, positioning India as a 'viable alternative' would require identifying the unique value proposition it offers to host countries. This paper argues that by leveraging its developmental diplomacy, private sector dynamism, and capacity to craft innovative models of cooperation, New Delhi can disrupt traditional narratives of resource extraction. The objective should be to grow into a competitive, reliable partner that not only secures supply chains but also actively shapes the future of mineral governance and green industrialisation across the region.

1. Introduction

The list of minerals categorised as 'critical', 'transition', 'green' or 'strategic' differs across countries according to a range of parameters, including economic importance and supply chain risk. As Kitaw (2024) notes, "criticality is in the eye of the beholder". Given their importance to renewable energy (RE) technologies, advanced manufacturing, and the defence sector, India will need to integrate industrial and resource security policies with its strategic and climate goals.

Over the past few years, New Delhi's critical minerals ecosystem has been evolving at an unprecedented scale and pace. In addition to identifying the list of minerals it deems critical, efforts have been concentrated on expanding domestic exploration and pursuing overseas acquisitions. Furthermore, legal frameworks have been updated, new inter-ministerial coordination bodies have been established, and a joint venture entity, Khanij Bidesh India Limited (KABIL), was established to pursue international partnerships. More recently, to set and implement policy direction, the National Critical Minerals Mission (NCMM) was launched in 2025 (Ministry of Mines, 2025).

In these collective efforts to ensure a steady feedstock of minerals to power the Indian economy, countries in Africa have become crucial. This, in many ways, is a natural progression of India's existing resource diplomacy in the region. Indian public sector undertakings (PSUs) already hold long-term contracts and equity stakes in oil and gas projects; private sector entities have acquired energy and mining assets, while firms such as Engineers India Limited deliver engineering and project management services across the continent. Central to India's energy security are countries such as Angola, Algeria and Mozambique, with Nigeria alone accounting for USD 10 billion of the country's crude imports (Ministry of External Affairs [MEA], 2025). In the same vein, seven MoUs have been signed between the Indian Ministry of Mines and countries in Africa, including Cote d'Ivoire, Malawi, Mali, Morocco, Mozambique, Zambia and Zimbabwe, covering broad areas of cooperation ranging from geological mapping and capacity building to joint investments.

The author's earlier work, "India, Africa and Critical Minerals: Towards a Green Energy Partnership," outlined nine policy pathways to inform a new era of mineral diplomacy between these regions. Over the medium to long term, the paper proposed focusing on the Southern African Development Community (SADC) region, deploying Indian infrastructure majors and technology start-ups, forging international collaborations, and harmonising commercial and strategic interests. In the short term, developing a white paper for Indian companies entering diverse mining jurisdictions, prioritising workforce development, creating knowledge networks, and incentivising responsible mining practices were emphasised.

Building on this foundation, and introducing layers of granularity, this paper focuses on three SADC countries, Zambia, Zimbabwe and Tanzania, across three interrelated themes: (i) geological mapping, surveying, and collaboration among geologists; (ii) encouraging sustainable mining; and (iii) capacity building.

Recognising that multiple entry points exist, this paper seeks to align each country with the policy pathway most relevant to its domestic context and India's existing engagement. That said, while the insights from this analysis are context-specific, they are likely to find resonance in other mineral-producing geographies.

The central question, therefore, is not merely where India should engage, but how: What capabilities should India deploy in each country and through which instruments?

For example, one of the Geological Survey of India (GSI)'s first overseas mineral exploration initiatives covers approximately 9,000 square kilometres in Zambia and involves joint work by Indian and Zambian geologists. This provides a basis for analysing the role of knowledge networks in the context of Lusaka. In Zimbabwe, where a relatively active civil society ecosystem has been advocating for community-led and responsible mining practices, the theme of sustainable mining governance finds resonance. Similarly, India has a long-standing capacity-building presence in Tanzania, including the establishment of IIT Madras' first overseas campus in Zanzibar (IIT Madras, 2023). Accordingly, the theme of developing a critical minerals workforce is examined in depth in the Tanzanian context, while acknowledging its broader applicability.

Against this backdrop, this paper also asks the following: How can India transform its existing

political and economic relationships with Zambia, Zimbabwe, and Tanzania into durable and mutually beneficial critical mineral partnerships?

The research adopts a thematic and country-level approach to assess how India can align its strategic and commercial interests with partner countries' industrial and development priorities, especially as African governments seek to diversify and deepen their global partnerships.

The findings presented in this paper were gathered through an extensive literature review and stakeholder consultations, including in-depth interviews of officials, industry and civil society representatives. Insights from policy dialogues in Zambia and feedback from online workshops organised with scholars from across geographies informed the case study design. Data collected were triangulated to help assess how India could enhance its credibility as a responsible actor in Africa's critical mineral supply chains.

The paper is structured as follows. It begins by situating India's historical, political, and economic engagement with Zambia, Zimbabwe and Tanzania, and establishes the policy relevance of adopting a thematic approach. This is followed by the case studies, each of which lays out (1) context and importance, (2) key opportunity, and (3) barriers and options to de-risk. It concludes with country-specific policy recommendations and a synthesis of cross-cutting insights.

2. Policy Relevance and Case Study Selection

A continent-wide analysis of African mining risks overlooks the diversity of political and economic realities and the variety of developmental contexts. In an effort to make the scope of examination more granular, this study focuses on Zambia, Zimbabwe, and Tanzania. These countries provide a nuanced lens to explore varied facets of India's engagement.

While the geographic focus allows for the integration of operational realities into the analysis, the thematic lens can be applied to various mineral-rich countries across the continent, as they have been identified as national and continental priorities. This approach will allow India to tailor its diplomatic and commercial strategies. The case studies examined are as follows:

- **Zambia:** advancing geological mapping in the copper-rich country.
- **Zimbabwe:** identifying opportunities that arise from responsible lithium mining.
- **Tanzania:** fostering value addition through technical and educational cooperation in the graphite and nickel sectors.

The selection of these countries is based on a few interrelated criteria. First, the variety they represent in the stages of diplomatic and commercial engagement. Second, the distinct opportunities they present for policy innovation. For instance, collaborations between GSI and its counterparts in Zambia demonstrate both the potential and the risks associated with Indian government institutions going global. Historically, they have focused on domestic mandates but can play an important role in strengthening resource governance and technical collaboration overseas. Similarly, the Zimbabwe case presents insights into the integration of ESG principles into mineral partnerships and explores how norms around responsible mining are actively shaped and negotiated. Likewise, India's long-standing emphasis on building knowledge networks with Tanzania is analysed as a form of value addition, illustrating how targeted skills transfer can support mineral-led industrialisation. The diversity of these cases enables an understanding of how policy innovations can be designed and tailored to local realities, while still being scalable across the region.

A combination of other factors, including feedback from government and industry stakeholders, local scholarly networks, access to primary data, prior fieldwork, and participation in regional conferences, also informed the case study selection. This study is part of a broader research series on India's critical mineral diplomacy across Africa; future papers will expand the analysis to additional countries identified through ongoing consultations and scoping exercises.

3. Foundations for Partnership: Pathways to Adding Value

India's ties with Zambia, Zimbabwe and Tanzania in the modern era were shaped during their liberation struggles and cemented by leaders such as Kenneth Kaunda, Robert Mugabe, and Julius Nyerere. While their visits to India and subsequent high-level bilateral exchanges built the diplomatic foundations,

contemporary relations are increasingly driven by geoeconomic considerations, including resource access and private sector investments. The Appendix lays out the range of India's engagement in these countries, from defence and energy to development. This depth and breadth of relations, therefore, provide meaningful contexts for analysing a new era of critical mineral partnerships.

India–Zambia bilateral trade stood at USD 450 million in 2024, as the two nations marked 60 years of diplomatic relations. Supported by the Export–Import Bank (EXIM Bank), Indian companies, such as Afcons, have been involved in infrastructure projects in the country, including the USD 289 million Lusaka City Road Decongestion Project. The growing economic partnership is supported by a significant diaspora, including 25,000 Persons of Indian Origin (PIO)'s and 5,000 Non-resident Indians (NRIs). Zambia represents a relatively mature mining economy with well-established copper and cobalt reserves, and a regulatory environment that has periodic challenges. To help navigate this, an India–Zambia Joint Working Group established under the framework of an MoU has ongoing discussions on how to expand cooperation in the mining sector (High Commission of India, Lusaka, Zambia, 2025).

In the face of Western sanctions, Zimbabwe, under Mugabe, undertook a "Look East" policy, which prioritised ties with countries including India and China. With 10,000 PIOs and the Indian business community in the country, and growing bilateral trade from USD 169 million in 2023–24 to USD 260 million in 2024–25, Harare is gaining traction among Indian industrial companies looking to set up manufacturing bases with access to Southern African markets (Participants of Confederation of Indian Industry [CII], India Africa Business Conclave, 2025). While it is more politically and economically volatile, Zimbabwe holds some of the world's largest hard rock lithium deposits (Mkodzongi, 2025).

However, recent policy instruments introduced to restrict the export of minerals in their raw form and emphasise local value addition present an important test case for how India might engage with assertive resource governance regimes. Currently, India's investments in Zimbabwe remain limited, with USD 500 million, which includes USD 310 million in Lines of Credit (LoCs) for upgrading energy infrastructure (Embassy of India, Harare, 2025). In a shifting policy landscape, future investments will be contingent on successfully navigating regulatory uncertainty.

Bilateral trade with Tanzania, home to over 40,000 PIOs, stood at USD 8.6 billion in 2024–2025, and investments cumulatively totalled USD 4.08 billion across agriculture, Information and Communications Technology (ICT), and infrastructure (High Commission of India, Dar es Salaam, 2025). India's development partnerships include LoCs exceeding USD 1.1 billion, of which USD 500 million has been invested in water projects across 24 towns, while 630 Indian projects have created 60, 000 new jobs. (Press Information Bureau [PIB], Government of India, 2023). Further, capacity-building initiatives with programmes like ITEC have trained over 5,000 Tanzanians to date (MEA, 2023). As Tanzania emerges as a supplier of minerals essential for battery technologies, with mining policies aimed at local beneficiation, existing developmental partnership frameworks provide opportunities to craft collaborative models of cooperation.

Leveraging India's existing engagement with these countries becomes especially pertinent, given the attention they are receiving from global investors. In Zambia, one of the world's top ten copper producers, for instance, the mining sector is dominated by foreign investors. America's Kobold Metals (Mingomba), Canada's Barrick Gold (Lumwana mine) and First Quantum Minerals (Kansanshi mine), Vedanta's (Konkola Copper Mines), and China Nonferrous Metal Mining Companies (Chambishi) are some key players.

Major foreign-controlled mines in Zimbabwe include Zimplats Holdings, a subsidiary of South Africa's Impala Platinum Holdings Limited, China's Zhejiang Huayou Cobalt and Sinomine Resource Group (Arcadia and Bikita), and UK-listed Caledonia Mining (Blanket and Bilboes mines) (Implats, 2025; Reuters, 2025; Caledonia, 2025). In Tanzania, Australian Walkabout Resources invested USD 20 million in debt financing and long-term offtake contracts in the Lindi Jumbo graphite project (Burke, 2025), and US Lifezone Metals secured USD 60 million financing for the Kabanga Nickel Project, while China's Zhingzhou mining is setting up the country's first nickel and copper refining plant (Ecofin Agency, 2025).

These three countries are a microcosm of the competitive landscape India will need to confront while attempting to balance its strategic interests with the development priorities of the host nations. This is in addition to navigating a variety of regulatory environments, resource endowments, policy uncertainty, and political risk. These case studies, therefore, serve

not only as illustrations of India's bilateral outreach but also as diagnostic tools for assessing the strengths and limitations of its mineral diplomacy in practice. They also help imagine ways in which New Delhi can move beyond transactional engagement, towards more embedded, long-term partnerships.

3.1 Case 1: Where and How Much? Resource Mapping in Zambia

Often quoted as a leading priority for African mineral-producing nations, during interviews and online workshops, is the need to enhance resource mapping and geological surveying. As one respondent pointed out, "before extraction or investments in the downstream sector, we need to answer two basic questions: where are the resources, and in what quantities do they exist?" (Participant at a Regional Policy Dialogue, Lusaka, 2025). Upstream engagement in mapping and exploration offers a low-visibility but strategically significant entry point for India. It not only builds trust and reduces information asymmetries but also aligns with Zambia's emphasis on knowledge transfer.

This section examines the context and importance of India's engagement in Zambia's copper sector, the opportunities in joint mineral mapping and surveying, and the challenges that exist. In light of data sovereignty concerns, GSI's capacity limitations, and the capital and time-consuming nature of mapping, it will outline options to de-risk these engagements.

Context and Importance

Zambia is a historic mining country whose story is deeply intertwined with copper (Mbolela, 2022). The rise and fall of Zambia's economy, its staggering debt burdens, and its complex engagement with international partners have all been shaped by the fortunes of this element. Referred to as "the metal of electrification," its role in the global energy transition remains indispensable (International Energy Forum, 2025). Due to its high electrical conductivity, second only to silver, along with strong corrosion resistance, and high malleability and ductility, copper is extensively used in powering RE systems, electric vehicles (EVs), and modern transmission infrastructure (Copper Development Association, 2019).

However, demand for copper is projected to exceed supply by almost 50 million tonnes by 2035 (S&P Global Commodity Insights, 2022). This 'copper deficit' could disrupt global economic stability and increase geopolitical tensions (Yergin et al., 2022).

India is not insulated from this potential risk. Its growing clean energy infrastructure is expected to increase demand for copper by an estimated 1.7 million tonnes by 2027 (Ministry of Mines, Government of India, n.d.). On a more granular level, Chadha and Pal (2025) project that copper demand in conventional sectors will reach 3.24 million tonnes by 2030, and the energy transition sector will rise to 274, 000 tonnes the same year. They further argue that at current production levels, known copper reserves will last only about 45 years. This underscores an urgent need to develop alternate supply sources, invest in upstream partnerships, and enhance recycling efforts.

This structural vulnerability is further accentuated by the fact that a large share of India's refining capacity relies on imports of concentrates and intermediates (Raizada & Moerenhout, 2024). These are largely from Japan, Tanzania, and Mozambique, while imports from Zambia were valued at USD 225,300 in 2024.

Globally, South American countries, Chile and Peru, account for a combined 38% of global copper reserves (Marican, 2024). The emergence of the Democratic Republic of the Congo (DRC) (6%) and Zambia (4%) into this ecosystem presents these African countries with the opportunity to attract investors to meet their developmental agenda and play a more prominent role in reshaping the minerals landscape (Muma, 2024).

To this end, in 2024, Zambia's Minister of Mines and Mineral Development unveiled an ambitious plan to raise copper production to 3 million tonnes by 2031 (Nsenduluka & Hobi, 2022). Considering that copper constitutes over 70% of Zambia's total exports, its importance to the economy is unmistakable. However, Lusaka's ability to overcome challenges, including persistent energy deficits and tax leakages, will determine success.

Opportunity: Map Resources

A critical challenge that Zambia shares with some other mineral-rich countries in the Global South is the lack of updated geological data (World Bank Group & International Finance Corporation, 2024). Large swathes of mineral data utilised today remain fragmented or outdated. Actors still rely on surveys conducted during the colonial era or later by Western mining firms. For policymakers, this data gap severely undermines their negotiating power and presents uncertainty in decision-making. According to a senior official, "entering negotiations without precise,

reliable geological information, the government risks weakening its bargaining position, reducing investor confidence, and potentially accepting unfavourable terms". (Participant at the High-Level Regional Policy Dialogue on Africa's Green Minerals Value Chain, Lusaka, Zambia, May 27–28, 2025).

Without accurate and comprehensive geological data, the potential for repeating past mistakes, entering negotiations and investment deals with insufficient knowledge of its resource potential and economic leverage is high (World Bank, 2018). This is perhaps why Zambia has begun to allocate significant blocks of its land to specific countries and corporations for exploration and development. Notably, a sizable 9,000 square kilometres of Zambian territory has been granted to India's GSI (Arora, 2025). This reflects both the growing trust in India's technical expertise and a new dimension to existing bilateral ties.

GSI's entry into this landscape could play a transformational role in filling existing data gaps. The current update, according to an official interviewed, is that the allocated land has been divided into six distinct zones, with six dedicated teams of GSI officials working alongside their Zambian counterparts (Senior Official, Government of India, May 2025). This project is still in the nascent stages, as Indian geologists only travelled to Zambia in June 2025, and it is therefore too early to assess outcomes. That said, it will be important for the GSI to release regular updates, as exploration licenses are time-bound, and indicating progress in this partnership will increase investor confidence.

Beyond state entities such as the GSI, emerging technology companies in the mining sector are also crucial. They have showcased their potential to be transformative in addressing such long-standing challenges. In the DRC, for example, the Spanish company Xcalibur, which specialises in airborne geophysical surveying and smart data mapping, has entered into agreements to support geophysical and geological mapping initiatives (Africa Finance Corporation & Xcalibur Multiphysics, 2023).

Similarly, KoBold Metals, a mining company backed by high-profile investors such as Bill Gates and Jeff Bezos, has partnered with Canadian firm Midnight Sun Mining to conduct exploration activities in both Zambia and the DRC. KoBold's USD 2 billion Mingomba project is projected to yield at least 300,000 tonnes of copper annually by 2030, signalling a significant shift towards data-driven, high-efficiency mining operations in the region (Steinberg & Patterson, 2024).

Indian private tech companies are also active in geological mapping and resource assessment. These firms are supporting mineral prospecting, utilising tools such as remote sensing, geospatial analytics, and artificial intelligence (AI)-driven exploration platforms. But India's presence in Zambia's critical minerals sector is primarily underscored by Vedanta's majority ownership of Konkola Copper Mines, one of the country's largest copper producers (Zambia Consolidated Copper Mines Investments Holdings Plc, n.d.).

There also appears to be strong alignment of policy priorities. Zambia's National Critical Minerals Strategy and India both emphasise the importance of geological mapping, upstream cooperation, and technological collaboration (Ministry of Mines and Mineral Development, 2024; High Commission of India, Lusaka, 2025). The employment of similar language in policy documents creates an avenue for deepening bilateral cooperation.

Barriers Encountered and Options to De-Risk

A historic institution, established in 1851, the GSI operates through a central headquarters with six regional offices and several state-level units across the country. Under the NCMM, launched in early 2025, the GSI has been tasked to conduct 1,200 critical mineral exploration projects between 2024–2025 and 2030-2031 (Ministry of Mines, Government of India, n.d.). It has undertaken 368 exploration projects over the past three years, with 195 in progress during 2024–2025 (PIB, Government of India, 2025).

While GSI's foray into Zambia signals its growing institutional capacity, as an organisation historically focused on the Indian subcontinent, its international exposure remains limited. This project in Zambia marks its second on the African continent. GSI's unfamiliarity with new geological, regulatory, and institutional contexts could potentially constrain project execution. Other challenges could include variations in data standards and logistical conditions that may increase operational risks (Ministry of Mines & PIB, 2025). To de-risk, India could build structured partnerships with host-country geological surveys, partner with private sector firms, and build capacity to strengthen GSI's operational capabilities internationally.

Further, the sector's long gestation periods and delayed returns should also temper expectations. Data from S&P Global underline how new mines brought into operation over the past three years have taken an average of 23 years from discovery to production (Li, 2023). This means that the success of India–Zambia geological surveys will also require sustained political will, institutional continuity, and long-term policy coherence on both sides (Le Dain, 2024).

Given these uncertainties, a more immediate and scalable complement to the acquisition of mines would be copper recycling. Copper's ability to be 100% recycled without any degradation of its inherent properties makes secondary production an increasingly attractive option. Currently, recycled copper accounts for nearly one-third of global supply (Chen & Wang, 2025). This is why major economies such as the US, the EU, and China are investing in systems to recover metals from end-of-life products.

India, too, is taking steps to strengthen its domestic recycling ecosystem. The government's removal of customs duty on copper scrap in the 2025–2026 Union Budget is seen as a move to bolster domestic recyclers and enhance the competitiveness of the country's copper industry (Chadha & Pal, 2025). However, for recycling to meet the anticipated surge in demand, global recycling rates would need to rise from 32% to at least 66%. This shift will require coordinated policy interventions, improved collection and processing infrastructure, and cross-border technological collaboration (Chen & Wang, 2025).

At the same time, Zambia's aim to enhance domestic processing requires foreign investors to contribute to training and capacity building. This aligns well with India's existing engagement with the country in workforce development and institutional training. Building on this, creating a dedicated innovation fund to advance mining technology and foster collaborative research and development hubs could also be considered (Vaidyanathan & Vijapur, 2025). This evolving convergence between Indian and Zambian priorities reflects a growing opportunity for India to shape its mineral diplomacy in the country.

3.2 Case 2: How to Mine Right and Why it Pays? Sustainability as Strategy in India's Lithium Diplomacy with Zimbabwe

One of the remarkable shifts in the mineral governance landscape is that producer countries are asserting their agency to negotiate fairer terms, prioritizing local value addition, and holding foreign investors accountable. Responsible mining practices will therefore no longer be peripheral concerns, but instruments that could potentially shape market access, as well as long-term project viability. As Indian firms begin to enter Zimbabwe, embedding ESG principles into their operations offers a pathway to mitigate reputational risk and align commercial objectives with host-country development priorities. This is to say that in resource-rich but politically sensitive ecosystems, sustainability can function not only as compliance but also as strategy.

This section examines Zimbabwe as a case study of how sustainable mining practices can support India's lithium diplomacy. It analyses the context and importance of India's engagement in Zimbabwe's lithium sector, the opportunity for responsible and community-oriented mining to translate into preferred access and local legitimacy, and the barriers Indian firms encounter in operationalising ESG commitments. It also outlines pathways to reduce risk, including engagement with civil society, community benefit-sharing mechanisms, and adaptive approaches to navigating regulatory uncertainty and resource nationalism.

Context and Importance

Lithium, the "white gold" of the energy transition, occurs in various natural sources, including igneous, volcanic, and sedimentary rocks, brines, salt marshes, and geothermal brines, and is one of the main ingredients in battery storage technology (Chandrasekharam et al., 2024). Given its wide-ranging use in storing wind and solar energy, the global demand is projected to increase exponentially from 500,000 tonnes in 2021 to 3–4 million tonnes by 2030 (World Economic Forum, n.d.) and is expected to grow tenfold by 2050 according to the International Energy Agency (IEA) Net Zero Emissions by 2050 scenario (IEA, 2021).

With demand expected to outstrip supply, experts estimate a lithium supply deficit by 2030 (Brunelli et al., 2024). This takes on a security dimension when considering that the top three lithium-producing countries control over 90% of the world's output; five lithium-supplying companies account for over half of its production; and 60% of the processing occurs in China (IEA, 2021). These supply concerns have prompted countries to take steps to ease some of the supply pressures on lithium. These include substituting with sodium-ion batteries, stepping up recycling of lithium-ion batteries, and increasing investments across the value chain.

Zimbabwe currently accounts for only about 1% of global lithium demand but has the potential to supply up to 20% (Reuters, 2018). The country has seven major lithium mines, and reserves are concentrated in regions such as Insiza, Mutoko, Buhera, Bikita, Arcurus, and Gwanda. Among these, Bikita is Africa's largest lithium mine. With an estimated 11 million metric tonnes, it positions Zimbabwe as one of the world's top sources of lithium (Masilela, 2023).

To capitalise on this potential and become a key player in the global lithium value chain, Harare has introduced a range of policy instruments demanding value addition. Statutory instruments 213 of 2022 and SI5 of 2023 are the most important. These ban the export of unprocessed lithium and base minerals to encourage local beneficiation and industrial development (Government of Zimbabwe, 2023). While some interpret this as a signal of growing resource nationalism, others see it as a deliberate attempt to build domestic capabilities and capture greater value from minerals.

India is 100% import-dependent on lithium. The primary import partners for lithium hydroxide are Russia (44%), Belgium (19%), China (12%), Latvia (10%), and the UAE (8%). For lithium carbonate, the import partners are the US (31%), Belgium (28%), Austria (7%) and Singapore (7%) (Chadha et al., 2025). It is estimated that India's demand for lithium-ion batteries is likely to increase by 115 GWh between 2022 and 2030 (ENS Economic Bureau, 2025). This urgently calls for policymakers to secure equity investments and offtake agreements in international mines, and eventually joint exploration and recycling. India's growing demand and Zimbabwe's potential role as a key supplier of lithium are complicated by China's dominance over the country's mining sector. Beijing controls most of the mining operations in Zimbabwe (Zimbabwe Environmental Law Association, 2025).

Further, discussions with environmental groups in Zimbabwe highlighted the severe environmental and social impacts of mining in the country. The central challenge appears to be "the tension between supply chain security and supply chain justice" (Wolters & Brusselaers, 2024).

While Indian companies are exploring opportunities in Zimbabwe's mining ecosystem, this case study examines the possibilities and constraints of a sustainability-oriented engagement model. It examines how India could align its interests with local priorities and international expectations in a sector that remains politically, economically and environmentally sensitive.

Opportunity: Sustainable Mining Practices Could Lead to Preferred Access

Zimbabwe aspires to capitalise on its lithium reserves with a strong sustainability agenda (Shaba, 2025). As Indian firms begin to explore opportunities in this southern African country, emphasising ethical partnerships will set it apart from other global actors (Zimbabwe Environmental Law Association, 2023).

This includes adherence to international best practices in environmental and social governance. Adoption of global standards, such as the International Council on Mining and Metals Principles or the Organisation for Economic Co-operation and Development's (OECD) Due Diligence Guidance for Responsible Mineral Supply Chains.

Even in the absence of strong enforcement mechanisms locally, emphasising ethical sourcing and sustainable operations would help Indian firms build credibility locally. Further, the success of Zimbabwean civil society organisations in improving governance in the diamond sector provides insights into how Indian actors could work alongside them to promote accountability (Mupfumi, 2017).

Social and environmental guardrails must therefore be central to Indian investments. Responsible practices, which were highlighted during interviews, including efficient water usage, waste management, and land rehabilitation, should be made non-negotiable elements of project design and execution.

Zimbabwe has undertaken several legal and institutional reforms to improve the investment

climate, particularly in the mining and development sectors. A key measure is the Zimbabwe Investment and Development Agency Act 2019/2024, which consolidates multiple investment-related processes under a single administrative authority. By streamlining the procedures for establishing foreign-owned companies and reducing bureaucratic red tape, the Act is aimed at creating an investor-friendly regulatory environment. This is especially significant in the mining sector, which has historically been viewed as high-risk. For Indian firms, many of which have limited operational exposure in African markets, such reforms represent a shift towards greater institutional transparency.

However, instead of applying international standards, Indian actors could seek to collaborate with Zimbabwean knowledge partners to make them relevant to the local context. An essential step to building durable, long-term partnerships.

Barriers for Indian Firms and Pathways to Reduce Risk

Zimbabwe possesses substantial reserves of lithium, but for India, there are barriers to converting these into viable opportunities. A key challenge remains the limited availability of accurate geological data. Indian companies need verified, high-resolution geological surveys to assess mineral quality and reserves. Firstly, the NCMM, through the GSI, can provide such data using modern survey technologies, funded jointly by government allocations and mining companies. This approach, as discussed in Case 1, reduces investor uncertainty in high-risk sectors like lithium extraction while maintaining transparency.

Secondly, Zimbabwe currently lacks domestic processing capacity, forcing it to export raw lithium concentrates such as spodumene and petalite (Muronzi, 2025). This misalignment with Indian industrial needs, especially in battery manufacturing, which depends on processed lithium compounds, has slowed direct industry uptake. This, however, could also be an opportunity for public–private partnerships to develop processing infrastructure, focused on adding value at source.

A notable example of this emerging India–Zimbabwe synergy is the partnership with a Mumbai-based company, which is leveraging proprietary technologies for lithium exploration and mining in Zimbabwe (Nyarota, 2025). It aims to eventually establish a battery-grade lithium processing facility. This marks a potential turning point in India's on-ground industrial presence in the region.

Thirdly, social and environmental challenges can lead to supply chain vulnerabilities, impeding financial stability. Lithium extraction in Zimbabwe has been linked to community displacement and ecological degradation, often impacting historically marginalised groups (Nyarota, 2025). Indian firms must embed robust social impact assessments into project planning, undertake inclusive consultations with local communities, and ensure fair compensation and resettlement where required. In the Zimbabwean context, these practices should be understood not as normative idealism or standards uniquely imposed abroad, but as an instrument to achieve commercial and geopolitical objectives.

Zimbabwe's mining sector is governed by a mix of progressive national laws and policies aimed at promoting responsible mining and ESG standards. However, significant gaps still persist in enforcement and practical application. While frameworks such as the National Environmental Policy and Strategies exist, their implementation is inconsistent, and regulatory oversight is often weak. The absence of Zimbabwe's participation in global transparency initiatives like the Extractive Industries Transparency Initiative and the limited success of the Zimbabwe Minerals Revenue Transparency Initiative further undermine supply chain transparency. The emerging vulnerabilities make it difficult for foreign investors, including Indian companies, to verify the social and environmental credentials of their lithium sources (NewsHawks, 2024; Transparency International Zimbabwe, 2020). Furthermore, not adopting due diligence can further reduce reliability and trust for firms, making ESG standards critical for securing supply chains.

While the potential of Zimbabwe's lithium does provide India with an opportunity to diversify its supply sources, its firms face a complex mix of challenges. These include but are not limited to infrastructure deficits, geopolitical competition, and regulatory unfamiliarity. Added to this, the long investment horizons, capital intensity and technical complexity associated with the sector, amplify concerns.

Offsetting these challenges requires a carefully calibrated approach. A key pillar of this strategy

should be financial and operational de-risking, including mechanisms to manage policy uncertainty and political volatility. Establishing such safeguards would not only protect Indian investments but also make projects more bankable and attractive to broader public–private collaboration.

India's EXIM bank could possibly play a role in shifting some of this risk by providing some financial buffers. Through instruments such as project-based financing, credit guarantees, and concessional lending, it can empower Indian firms to move beyond exploration and commit to downstream activities like processing and value addition (EXIM Bank, n.d.).

Simultaneously, India can enhance its credibility by promoting value addition within Zimbabwe, such as through local processing of minerals needed for India's energy transition technologies. This approach supports India's green industrial goals while aligning with Zimbabwe's aspirations for economic diversification and job creation. Given India's own limitations on processing technology, the feasibility of trilateral cooperation with advanced economies could also be explored.

3.3 Case 3: Can Knowledge Power Value Chains? Capacity as the Cornerstone of India–Tanzania Critical Mineral Cooperation

Discussions around value creation in mineral supply chains rarely focus on the role of human and institutional capacity. That said, in several interviews, the importance of skilling a mineral workforce in order to move into processing, refining and downstream manufacturing was highlighted.

This section examines Tanzania as a case study of how knowledge and capacity building can anchor India–Africa critical mineral partnerships. It analyses the context and importance of India's engagement in Tanzania, the opportunities to leverage India's strengths in education, training, and technology to support value addition within the mineral sector, and the barriers that constrain implementation. It also identifies pathways to de-risk such cooperation, including institutional partnerships, skills-focused investments, and alignment with Tanzania's industrialisation and localisation objectives.

Context and Importance

Nickel plays a pivotal role in the clean energy transition, particularly as a key component in the cathodes of lithium-ion batteries that power EVs (Kotal et al., 2022). It is also essential for a wide range of low-carbon technologies, given its high thermal stability and strong resistance to corrosion. As the market for these expands globally, so does the demand for battery-grade nickel, especially Class I nickel with high purity, with current projections predicting an increase of 65% by the end of the decade (IEA, 2021). However, experts caution that existing reserves may be insufficient to meet future demand. This raises concerns about long-term supply security as well as cost volatility. Nickel is mined in over 25 countries (Lombard Odier, 2024), and Indonesia currently dominates global nickel exports (40-50%). Other suppliers include Australia (21.3%), Brazil (17%), Russia (7.3%), Cuba (5.9%) and the Philippines (5.1%) (Dilshara et al., 2023).

Graphite, often referred to as "the silent partner in the energy transition" (S&P Global Commodity Insights, 2024), is a critical component in battery anodes and essential to the EV story. It is sourced in two primary forms: natural graphite and synthetic, and the latter is derived from petroleum or coal tar coke. Graphite's recyclability offers strong long-term potential for sustainable battery supply chains (Energy Transitions Commission, 2023). The global production of natural graphite is currently dominated by China. But new projects are emerging in East Africa, particularly in Madagascar, Mozambique, and Tanzania, indicating a gradual diversification of sources (Willige, 2025).

Tanzania holds significant potential in both nickel and graphite, and is an emerging player in the critical minerals sector. Nickel has been identified in the Karagwe-Ankolean and Bukoban rock systems, particularly at Kabanga in the Kagera region, which is ready for mine development.[1] Graphite is present within the Usagaran metamorphic rock formations across Morogoro, Lindi, Tanga, and Arusha. This reinforces Tanzania's role in supplying battery-grade materials (Olan'g, Kafumu, & Silas, 2024). The country is transitioning from raw mineral exports towards value addition by implementing legal reforms, advancing geological mapping, expanding infrastructure, strengthening capacity, and introducing targeted investment incentives (Kulaba, 2022).

[1] Additional deposits are found in mafic rocks at Nditi in the Lindi region, as well as at Zanzui and Dutwa in the Simiyu region, with further untapped potential in the country's Northwestern and Southern regions.

India possesses an estimated 211 million tonnes of graphite reserves across Chhattisgarh, Jharkhand, Odisha, and Tamil Nadu. However, to meet domestic demand, it remains import-dependent. The primary sources are China (54%), Madagascar (23%), and Mozambique (10%) (Indian Bureau of Mines, 2022). In contrast, India's nickel reserves are limited, and there are currently no active mining leases for the mineral. As a result, the country imported nickel worth approximately USD 1.26 billion in 2024 (Ministry of Mines & PIB, 2024). This highlights a critical vulnerability in its battery materials supply chain.

Tanzania's significant reserves of graphite and nickel align well with India's rising demand for battery-grade minerals. As India looks to secure critical inputs for its clean energy and industrial transition, Tanzania offers both resource potential and a policy environment increasingly geared towards value addition and local development.

For instance, Tanzania has undertaken several legal reforms[2] to enhance its domestic mining while building an attractive investment climate to advance the sector (Mangasini et al., 2025). Tanzania aims to integrate mining in its development agenda through positive policies such as the Integrated Industrial Development Strategy (IIDS), which promotes linkages between mining and manufacturing operations. Furthermore, by assigning the development of strategic minerals to the National Development Corporation, Tanzania is strengthening its institutional capacity to enhance its mining ecosystem. Tanzania is also set to conduct a geological survey to map minerals across 50% of the country (African Mining Market, 2025).

By aligning with Tanzania's policy reforms and industrial goals, Indian partnerships can play a vital role in enhancing in-country processing, infrastructure development, and promoting skills transfer.

Opportunities: Leverage Strengths to Assist in Value Addition

To build resilient and responsible supply chains in Tanzania's critical mineral ecosystem, India must pursue an approach that combines workforce development and targeted RE infrastructure investments (Vaidyanathan, 2025).

Despite vast reserves, Dodoma has yet to harness its minerals for development goals, as its ability to move up the value chain is constrained by gaps in industrial capacity, workforce skills, and supporting infrastructure. Nickel mining is at a nascent stage of the value chain, with one substantial project to produce battery-grade materials domestically (Olan'g et al., 2024). Comparatively, graphite mining in Tanzania is at an enhanced state, but has not reached its potential in the international markets. Two Indian companies (MEA, 2023) have already secured licences for graphite extraction, indicating early-stage industry engagement and regulatory access.

Tanzania aims to deploy a twin approach of building production linkages and consumption linkages to enhance its mining ecosystem (Olan'g et al., 2024). The first includes developing upstream production, processing, refining, and transforming mineral outputs into manufacturing inputs, while the latter includes building supply channels of other minerals or products that are required for manufacturing battery-grade products.

To achieve this agenda, Tanzania is poised to address its limited capacity in processing minerals by (i) improving technical skills and local capacity, (ii) mechanising financing structures to strengthen economies of scale for value addition, and (iii) building supporting industry infrastructure, primarily electrification. These priorities present as opportunities for India to deepen its critical minerals interests through partnerships with Tanzania.

Indian infrastructure companies are already active in Tanzania. From utilising the LoC of USD 500 million for water infrastructure projects (MEA, Government of India, 2023), to indicating interest in developing court buildings (African Intelligence, 2024), as well as Tanzania's Standard Gauge Railway project intended to link the port of Dar es Salaam with Rwanda, Burundi, the DRC, and Zambia (Mbago, 2025).

In addition to this, India can also play a meaningful role in helping Tanzania build a critical minerals workforce. Currently, India offers 1,000 ITEC and 85 ICCR scholarships to Tanzanian citizens. This is part of a long-standing education partnership between the countries that began as early as 1972, which has benefited over 8, 855 Tanzanians over the years

[2] This is reflected primarily through the 2009, and then 2010, Mining Policy that stipulates advancement of Tanzania's socio-economic development through mining activities. Alongside the 2017 Natural Wealth and Resources Act, the revised Mining Act of 2019 defined critical minerals, mandating domestic processing before exports. Accordingly, the recently deployed Tanzania Investment Centre is poised to simplify administrative procedures for mining companies.

(High Commission of India, Dar es Salaam, n.d.). These scholarships support training across technical, managerial, and policy-related disciplines relevant to Tanzania's development priorities. India's expertise in graphite mining and beneficiation (Indian Bureau of Mines, 2022) can also be leveraged to support workforce development in Tanzania. India could offer technical training programmes specifically designed for graphite processing, addressing the skill bottlenecks in Tanzania's labour market. These could build on existing ITEC platforms and be tailored to the needs of critical mineral industries.

Further, the IIT Madras campus in Zanzibar has the potential to serve as a vital hub for technical capacity building. Its existing partnerships with the Grid Controller of India (GRID-INDIA), to strengthen Tanzania's energy infrastructure, could be modelled in other domains (IIT Madras, 2025).

Training and capacity building on mineral exploration and mining project development offered by the Central Mine Planning and Design Institute (CMPDI), a subsidiary of Coal India Limited, to Tanzania's National Development Corporation is also noteworthy (Central Mine Planning and Design Institute Ltd., n.d.). CMPDI's expertise in infrastructure engineering and environmental management could complement Tanzania's efforts to promote sustainable mining practices.

Collectively, these initiatives illustrate the numerous ways through which Indian technical and educational institutions can support Tanzania's aspiration to build a skilled workforce.

Barriers and Pathways to De-Risk

Tanzania at present has no operating, smelting, or refining capacity for nickel (Olan'g et al., 2024). Measures to address this are underway. The Tembo Nickel Corporation, a joint venture partially owned by the Government of Tanzania, is planning a multi-metal smelting facility at the Kabanga Nickel Project (Shanghai Metals market, 2025). That said, Tanzania's existing power and transport infrastructure may be unable to support these operations at scale, given how energy-intensive they are. The absence of stable utilities has been one of the chief factors that have hindered value addition efforts in the country, according to the Tanzania Minerals Audit Agency (TMAA).

In this context, India could position itself as a partner, providing complementary services, such as workforce training, but also deploy its private sector to invest in solar or hybrid mini grids near mining towns. However, as India's domestic industry significantly lacks expertise in nickel refining, its companies could explore joint ventures with local or third-country partners who possess technical capabilities in nickel smelting and metallurgy. These collaborations will embed Indian actors in longer-term project cycles, reducing exit risks and improving reputational outcomes.

Further, adopting a transnational cluster-based model, working with Tanzania and its neighbouring countries, such as Mozambique or Madagascar, to develop a shared graphite beneficiation and processing ecosystem could also help shift risk. In addition to improving regional competitiveness, it would also enable cost-sharing and increase supply chain resilience by diversifying processing hubs.

Finally, India should build on past multilateral initiatives to scale its presence. The trilateral RE partnership between the US, India, and Tanzania, launched to support clean energy deployment, offers a potential model for joint efforts in the critical mineral space (US Embassy, Tanzania, 2024). By extending this framework to include critical mineral-linked industrial infrastructure, India can align its economic diplomacy with shared energy transition goals and gain a foothold in key supply chains. In sum, technical partnerships that integrate skills development, RE-linked infrastructure, and industrial collaboration are vital to de-risking Indian investments in Tanzania. A phased and regionally coordinated plan will enable India to transition from a buyer to a co-developer in Africa's critical mineral future.

4. Policy Options: Towards Sustainable, Competitive Indian Investment

It is in the midst of heightened geopolitical tensions, a fragmenting economic order, and increasing securitisation of supply chains that this paper is drawing up policy options to inform India's critical minerals diplomacy. These exigencies have already led to new forms of interest-based coalitions in global mineral governance. This includes the emergence of multilateral frameworks (e.g. Minerals Security Partnership), minilateral initiatives (e.g. QUAD Critical Minerals), and bilateral agreements (e.g. US-DRC Strategic Partnership) (Sinh and Xavier, 2025; US Department of State, n.d.).

In this context, India must, on the one hand, forge partnerships with like-minded partners such as Japan, the EU and Australia, and on the other hand, employ its comparative advantages to find meaningful and ethical ways to access resources from mineral-producing partners in Africa.

This paper argues that there are significant opportunities for the Indian government and industry across the critical minerals ecosystem in various African mining jurisdictions. For exploration firms, countries in Africa offer vast, underexplored geological potential with increasingly standardised regulatory regimes under the Regional Economic Community frameworks. Meanwhile, Indian mineral processors and recyclers stand to benefit from partnerships that support local beneficiation and circular economy initiatives, enabling early access to raw and semi-processed materials while contributing to regional industrialisation goals.

A major bottleneck for a mineral-led green industrialisation for several African economies remains financing. India can enhance its competitiveness by establishing a sovereign-backed Critical Minerals Development Fund to de-risk private sector participation. For Indian firms navigating complex and foreign ecosystems, such a fund could act as an instrument of guarantee and technical assistance.

The following section offers country- and theme-specific policy options designed to operationalise India's strategic engagement in the critical minerals sector across Zambia, Tanzania, and Zimbabwe. These recommendations are tailored to the distinct political economies, resource endowments, and development priorities of these countries.

4.1 Zambia: Advancing Technical Cooperation in Geological Mapping

India's strengths in geosciences and existing institutional capacities present an opportunity to collaborate with Zambia in geological mapping. The India–Zambia Technology Transfer Programme was one of the many initiatives highlighted in the 6th session of the Zambia–India Joint Permanent Commission.

- **Operationalise existing MoUs:**
  - Track progress with regular follow-up meetings of the Joint Working Groups.
  - Identify at least three priority projects for implementation in the next year.
- **Co-develop mineral data repositories:**
  - Establish a team of Indian and Zambian geologists to create open-source, accessible mineral repositories, with regular training on resource mapping.
  - Conduct annual exchange programmes to share best practices and field visits.
- **Collaborate on early-stage exploration:**
  - Jointly conduct feasibility studies, including environmental assessments and field surveys.
  - Facilitate public–private partnerships where Zambian agencies assist in navigating regulatory environments, while Indian firms provide technical expertise.
- **Pilot an Indo-Zambian Mineral Innovation Hub:**
  - Follow the model of the Indo-Zambian Bank, co-owned by Indian state-owned banks (60%) and the Zambian government (40%), to design a mineral innovation hub.
  - Launch programmes such as Small and Medium Enterprise incubation in mining services, to support local-value add initiatives.
- **Build India–Zambia university and vocational training partnerships:**
  - Develop technical courses in geospatial analysis, remote sensing and digitisation of mineral data.
  - Connect Indian technology start-ups in the mining sector to offer workshops to facilitate skills transfer to Zambian students and professionals.

4.2 Zimbabwe: Promoting Responsible and ESG-compliant Mining Practices

By prioritising sustainability and responsible mining in Zimbabwe, the Indian industry can enhance the credibility of its operations.

- **ESG-driven mine-site rehabilitation:**
  - Link measurable ESG performance, such as mine-site rehabilitation, to preferential access to mining licenses.
  - Regularly trace and report ESG indicators such as pollution reduction, local employment generation, and community infrastructure improvements.

- **Community mining stewardship councils:**
  - Identify community leaders, establish councils in mining regions, and provide training in safety standards and traceability systems.
  - Conduct regular training workshops and capacity-building programmes to strengthen council operations and ensure sustainable local governance.
- **Low-emission mining and sustainable processing:**
  - Introduce pilot projects or public–private platforms to test low-emission mining technologies and sustainable processing techniques.
  - Facilitate transfer of Indian clean mining technologies, with measurable outcomes in resource optimisation and energy efficiency.
- **Zimbabwe–India responsible mining monitoring:**
  - Constitute a working group with civil society, industry, and government to monitor environmental impact, labour standards, and measure local development outcomes.
  - Produce reports that are publicly available to improve transparency and incentivise responsible practices.
- **Integrated industrial models for the lithium value chain:**
  - Encourage Indian companies to adopt integrated industrial approaches, linking mining with local recycling and downstream manufacturing.
  - Guide other Indian investors to set up recycling and manufacturing plants, promoting local value addition and strengthening the lithium sector ecosystem.

4.3 Tanzania: Strengthening Skills and Workforce Development

Central to Tanzania's Vision 2030 strategy is to boost productivity and local value addition in mining. Given Dodoma's long-standing educational and technical ties with New Delhi, workforce development can be a core component of cooperation.

- **Regional mining training hub:**
  - Position IIT Madras, Zanzibar as a regional centre for training mining professionals and offering industry-linked undergraduate and postgraduate programmes in mining engineering.
  - Integrate workforce training with real-world mining challenges, ensuring graduates are well equipped to work in the Tanzanian extractives sector.
- **Technical institute partnerships:**
  - Partnering with existing centres, such as the Vitongoji Vocational Training on Pemba Island, to set up lab facilities, and co-design training programmes in mineral processing.
  - Link Indian and Tanzanian faculty to jointly develop a curriculum that aligns with local industry needs and emerging green mineral technologies.
- **Skills transfer and exchange programmes:**
  - Facilitate internships and technical exchanges with the mining research and development ecosystem in India.
  - Create knowledge-sharing platforms and mentorship programmes linking Indian experts with local trainees.
- **Expanded extractives education via ITEC/ICCR:**
  - Expand existing ITEC and ICCR courses with modules that focus on metallurgy, digital mining tools and sustainability.
  - Enhance local workforce competencies with professional certification programmes.
- **Trilateral and international cooperation:**
  - Explore trilateral partnerships with international organisations to establish India-supported centres of excellence for mining education, regulation, and innovation.
  - Position these centres as regional hubs for policy, research, and workforce development, supporting Tanzania's extractive sector and broader Indian engagement in Africa.

5. Conclusion

The essence of this paper is this: For India to emerge as a credible partner in Africa's mineral sector, its engagement must be context-sensitive, balancing its commercial interests with the development agendas of host countries. This approach will help craft a practical roadmap to operationalise its mineral diplomacy.

To do this, specific policy instruments and manoeuvres need to be identified that build on India's existing engagement but also leverage its comparative strengths. Bridging this with the agendas outlined by partner countries will help ensure that cooperation in critical minerals extends beyond narrow transactional interests.

The paper also argues that embedding technical, social, and institutional cooperation into India's mineral partnerships across Africa will help position it as a meaningful actor in an increasingly competitive landscape.

Moving 'beyond the ore', as the title of this paper suggests, requires New Delhi to translate its development diplomacy, private sector dynamism, and capacity for innovation into viable frameworks of cooperation.

Finally, as African mineral-producing governments increasingly assert their agency in shaping the terms of their resource governance, India's responsiveness to these priorities will be central to building resilient, inclusive, and consequential partnerships.

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Appendix

Overview of India's Bilateral Relations with Tanzania, Zimbabwe, and Zambia.

	Zambia	Zimbabwe	Tanzania
Diplomatic History	India and Zambia established diplomatic relations in the immediate aftermath of Zambia's independence from British colonial rule in 1964.	India and Zimbabwe are historical trading partners and have maintained a cordial relationship. India was also an active supporter of Zimbabwe's independence in 1980. Since then, both countries have aligned their attendance at Summits such as the Non-Aligned Movement (NAM), Commonwealth Heads of Government Meeting (CHOGM), and Group of Fifteen (G-15).	India has a traditionally close and cooperative relationship with Tanzania, which spans back to its independence in 1963. Since then, the two have aligned on several developmental issues and policies across international frameworks, including anti-colonialism, non-alignment, and South–South Cooperation.
Strategic Focus and Approach	India engages with Zambia on various developmental as well as security issues: energy, critical minerals, infrastructure, judicial processes, health, defence, mining, and education.	India and Zimbabwe have strengthened mutual economic benefits and trade in various sectors, including energy and minerals. Alongside these bilateral partnerships, India supports Zimbabwe's developmental agenda, including education and economic revival.	India and Tanzania are robust and mutually dependent trade partners. India and Tanzania partner on issues related to development and defence, mainly enhancing access to energy and water, while supporting capacity building and education.

	Zambia	Zimbabwe	Tanzania
Diplomatic Engagement	High-level diplomatic meetings and agreements between India and Zambia have been enhanced recently in targeted developmental areas. In 2018, India and Zambia signed four agreements on the avoidance of double taxation, the establishment of the Entrepreneurship Development Cooperation Centre, the exemption of visas for diplomatic passport holders, and judicial cooperation. During the 2019 visit of Zambia's President to India, the two states signed seven MoUs on (i) defence, (ii) geological mapping and minerals, (iii) health, (iv) culture and arts, (v) electoral processes enhancement, (vi) tele-education, and (vii) diplomatic training. India and Zambia also signed an MoU in 2025 on the Promotion of Cooperatives to facilitate trade alliances. In November 2024, the 6th session of the Joint Permanent Commission at the ministerial level took place after a gap of 19 years. Held in Zambia, the session saw both countries review bilateral relations in various areas of cooperation like agriculture, education, energy, housing development, and finance, to name a few.	Diplomatic exchanges and bilateral trade agreements between Zimbabwe and India have recently multiplied, fostering cross-country businesses, trade, and sustainable growth. In 2018, a total of four MoUs were formalised on (i) arts, culture, and heritage, (ii) geology, mining, and mineral resources, (iii) traditional medicines and homoeopathy, and (iv) broadcasting collaboration. Additionally, an action plan on ICT and an agreement on visa exemption for diplomatic passport holders were also signed. Subsequently, in 2021, 19 more MoUs were finalised between business delegations during the Zimbabwe–India Business Forum in key sectors, where India encouraged firms to form partnerships in Zimbabwe, both for the domestic economy and for the wider SADC and Common Market for Eastern and Southern Africa (COMESA). Three Foreign Office consultations have been held so far between the two countries: in 2017, 2022 and 2024. The meeting allowed a chance for both sides to review the gamut of bilateral partnerships and agreements, as well as explore opportunities for further collaboration.	High-level visits between Tanzania and India have been periodic and have seen growth in the post-pandemic period. In 2023, Tanzania's Presidential visit to India addressed a vast array of aligned interests. This included maritime technology and cooperation, defence, anti-terrorism and security, education, capacity building, digitalisation, sports, port infrastructure and development, health, power and water, traditional medicine, and homoeopathy. The visit resulted in the signing of four MoUs and two agreements. There has been growing momentum towards India–Tanzania partnerships and cooperation in recent years. India–Tanzania Joint Working Group on Counter Terrorism met in 2025 in Dar es Salaam to discuss emerging threats such as state-sponsored and cross-border terrorism. The fourth edition of the Joint Defence Cooperation Committee between the two countries was held in February 2026, where both sides reviewed areas of collaboration like military training and maritime security.

	Zambia	Zimbabwe	Tanzania
Development Cooperation	Development cooperation and assistance are at the crux of India's diplomatic relations with Zambia. **Energy:** Sharing India's development with Zambia is beneficial to both nations. India committed over 100 solar-powered irrigation pumps to Zambia in 2022. **Education and Technology:** India recently implemented the Pan-Africa E-network Project to strengthen technology and education access in three sites across Zambia. **Infrastructure:** EXIM Bank of India and the Government of Zambia financed an Indian group to implement the Lusaka City Road Decongestion Project worth USD 289 million. **Health:** India has extended LoCs worth USD 50 million and an additional USD 18 million since 2011, for the construction of 650 rural prefabricated health posts. During the COVID-19 pandemic, India donated 6,000 kilograms worth of medicines as humanitarian aid. India also gave USD 1 million worth of medical equipment in 2025, across all 10 provinces of Zambia. India and Zambia also held their first Joint Working Group on Health in July 2025, in a hybrid mode. **Notable Assistance:** Since the 1970s, India has provided credits and infrastructure support to enhance Zambia's development agenda. Recently, in 2024, India provided medicines to help Zambia address public health issues, particularly cholera.	Development cooperation is progressing in tandem with now-accelerating business and trade relations between India and Zimbabwe. **Energy:** In June 2021, Zimbabwe ratified the Amended Framework of the International Solar Alliance (ISA). **Education and Technology:** The ITEC scholarship programme, established in the 1980s, has successfully grown to support 1,400 Zimbabweans in providing short-term education and capacity building. **Notable Assistance:** Most recently, India extended a grant of USD 1 million to Zimbabwe in response to the 2016–2017 flood disaster in Zimbabwe (MEA, 2016).	India's development cooperation with its close trade partner, Tanzania, reflects goodwill and a long-standing partnership. **Energy:** India is collaborating with the US and Tanzania on a "Triangular Development Partnership" (TriDEP) to accelerate RE deployment in Tanzania. India and Tanzania also signed an MoU in 2025 for bilateral cooperation on the peaceful use of nuclear energy. **Education and Technology:** Tanzania is a major beneficiary of training courses allocated under India's ITEC and ICCR scholarships in the 1970s. Since then, 8,855 Tanzanians have benefited from the programme. In 2023, India established its first IIT Madras offshore campus in Zanzibar, Tanzania. **Notable Assistance:** India's aid to Tanzania focuses on three areas: (i) public health, (ii) infrastructure, and (iii) education. For example, India provided medicines and vaccines worth USD 1 million in 2019, and then continued providing essential medicines, of relatively similar amounts, in 2020 and 2022.

	Zambia	Zimbabwe	Tanzania
Bilateral Trade	Bilateral trade between India and Zambia was approximately USD 450 million in FY 2023–2024. However, in 2024–25, total trade dipped to USD 380 million. Both countries boast a mutually dependent trade relationship. There is more potential for growth in mining, agriculture, pharmaceuticals, and petroleum products. The third session of the India–Zambia Joint Trade Committee was held virtually in June 2025.	Bilateral trade between India and Zimbabwe showed a positive economic partnership of USD 260 million in 2024–25, growing from USD 169 million in 2023-24. Indian investments in Zimbabwe are estimated to be USD 500–600 million in various industries, including beverages, pharmaceuticals, and agro processing.	India is the third-largest trading partner of Tanzania, with bilateral trade of USD 6.4 billion in 2022–2023, which jumped to USD 8.6 billion in 2024–25. Further, Indian investments in Tanzania amounted to USD 4.08 billion in 2025. India's primary exports to Tanzania include petroleum products, pharmaceuticals, vehicles, electrical goods, iron and steel, and so on. Tanzania's major exports to India include gold, cashew nuts, pulses, timber, spices, ores, metal scrap, and gemstones.
LoCs	In 1984, the Indo–Zambia Bank was established as a joint venture between the Government of Zambia (40% equity) and three Indian public sector banks (60% equity): the Bank of India, the Bank of Baroda, and the Central Bank of India, reflecting strengthened institutional capacity in bilateral financing mechanisms. India's LoCs to Zambia have increased steadily, accounting for approximately USD 128 million across infrastructure and health projects. A notable example is the 120 MW Itezhi Tezhi Hydropower Project (ITHP), a joint venture project between a Zambian power company and an Indian supplier, where India extended a loan of USD 50 million in 2016.	India's LoCs to Zimbabwe have increased dramatically, reaching USD 468 million in infrastructure and energy projects. Bilateral partnerships between India and Zimbabwe reflect the much-needed state-led financing channels required to enhance regional and international trade. For example, in 2015, using the Indian EXIM Bank's Buyers Credit Agreement facility worth USD 50 million, essential vehicles and spare parts were sourced from Indian companies to supply to Zimbabwe. Further, USD 13 million worth of mining equipment, blast hole drill, and spare parts from Indian companies were supplied to local companies.	India's LoCs to Tanzania show a reliable partnership, accounting for USD 1.1 billion in infrastructure, water and automobile procurement projects. Notable developmental partnerships indicate India's role in enhancing Tanzania's water infrastructure and other such developmental projects. In 2018, India formalised a LoC agreement worth USD 500 million with Tanzania. It also granted the extension of the water pipeline from Lake Victoria to smaller towns. India further advanced defence cooperation with Tanzania by establishing a LoC of approximately USD 36 million for the supply of vehicles to the Tanzanian People's Defence Force (TPDF) in 2013–2014.

About the author

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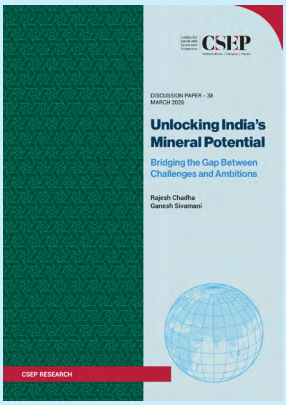
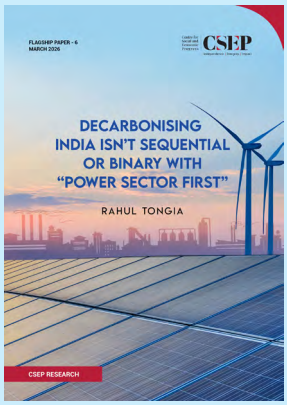
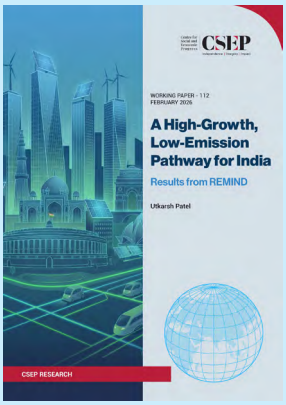
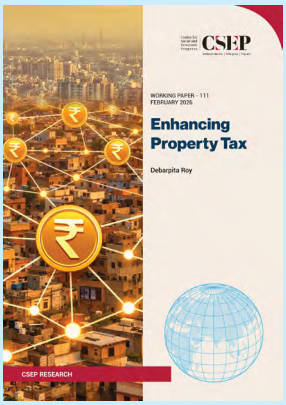
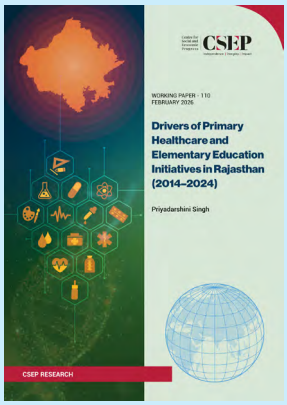
Other publications

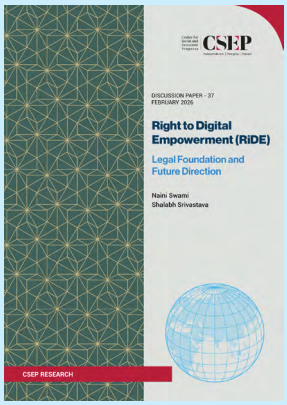


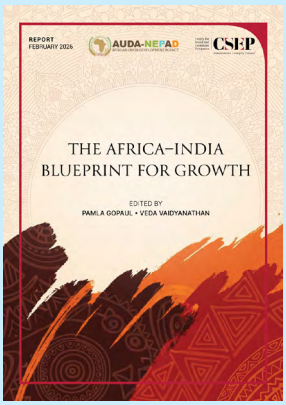


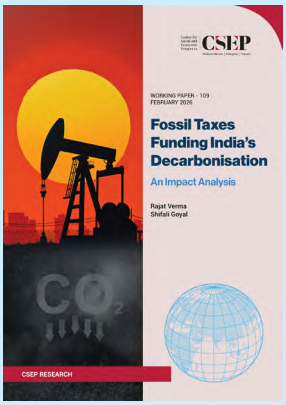


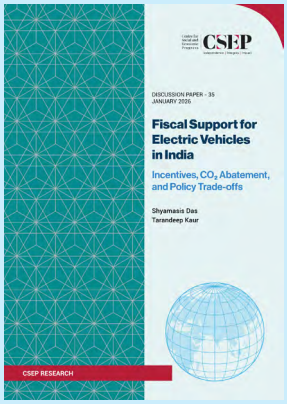


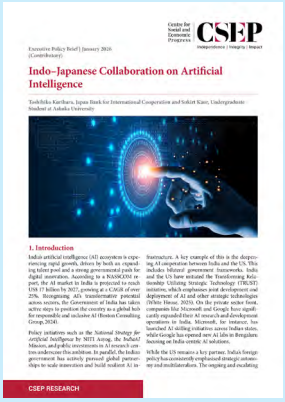


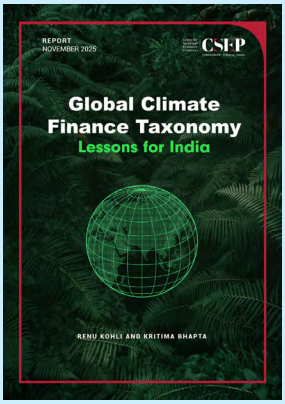












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