

Critical Mineral for Security and Prosperity – *The Role of QUAD*

The critical minerals sector has emerged as a focal point due to its economic significance and supply vulnerabilities. Two primary issues plague the sector: supply chain disruptions arising from geographical concentration and geopolitical factors, and suboptimal utilisation of vital minerals, resulting in wastage.

The Briefing Paper discusses the supply-side issues briefly and delves into the potential role of the Quadrilateral Security Dialogue (QUAD) countries in shaping discussions and policies around critical minerals to ensure a sustainable supply chain in the Asia-Pacific region. Through cooperative efforts, QUAD countries are strengthening their position in the Mineral Security Partnership.

Introduction

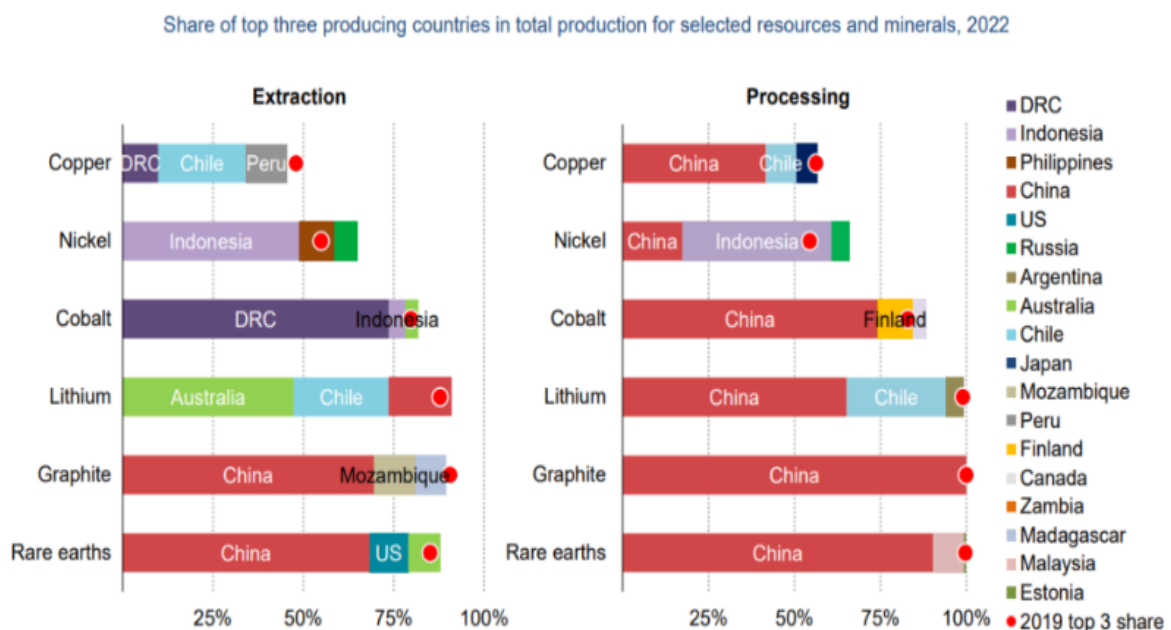
Minerals are identified as 'critical' based on their great economic importance and supply risk. These minerals are essential components in clean energy transition, defence, telecommunication, Information Technology and healthcare. In 2022, the Ministry of Mines in India formed a committee that recognised 30 essential minerals, such as lithium, cobalt, nickel, and germanium, crucial for the country.¹

¹ "Thirty Minerals Listed as Critical Minerals for India", Press Information Bureau, December 11, 2023, [https://pib.gov.in/PressReleaseDetail.aspx?PRID=1984942#:~:text=The%20Ministry%20of%20Mines%20had,Critical%20Minerals%E2%80%9D%20\(CECM\).](https://pib.gov.in/PressReleaseDetail.aspx?PRID=1984942#:~:text=The%20Ministry%20of%20Mines%20had,Critical%20Minerals%E2%80%9D%20(CECM).)

Concurrently, the US Geological Survey, also in 2022, outlined a global list of 50 critical minerals subject to reassessment every three years.² The demand for these minerals is skyrocketing across the globe but the supply falls short. Therefore, strategic partnerships are crucial at the global level for a sustainable critical mineral supply chain.

Issues Around

There are two broad supply-side issues associated with the critical minerals sector. Firstly, critical minerals are subject to supply chain disruptions due to the rarity and geographical concentration of their availability and production coupled with distorted trade policies and political uncertainties. For instance, the Democratic Republic of Congo mines 69 percent of global cobalt, Indonesia 33 percent of nickel, and China dominates Rare Earth Elements.³



Restrictions on the export of gallium and germanium by China and its ban on high-grade graphite in 2023 have threatened the global market.⁴

² "U.S. Geological Survey Releases 2022 List of Critical Minerals", The United States Geological Survey, February 22, 2022, <https://www.usgs.gov/news/national-news-release/us-geological-survey-releases-2022-list-critical-minerals>.

³ Chadha, R. Sivamani, G. and Bansal, K. (2023). Assessing the Criticality of Minerals for India: 2023 (CSEP Working Paper 49). New Delhi: Centre for Social and Economic Progress.

⁴ "China, world's top graphite producer, tightens exports of key battery material", Reuters, October 21, 2023, <https://www.reuters.com/world/china/china-require-export-permits-some-graphite-products-dec-1-2023-10-20/>.

Secondly, critical minerals are not being optimally utilised. Many of the vital minerals end up on the pile of discarded tailings. For instance, Australia has the world’s largest supply of four critical minerals namely nickel, rutile, tantalum and zircon. It is also in the top five for cobalt, lithium, copper, antimony, niobium and vanadium. Even many of these minerals can be produced as a side benefit of mining copper, aluminium-containing bauxite, zinc and iron ores. But to date, Australia is not making the most of this opportunity.⁵

QUAD’s Role

QUAD countries, namely India, USA, Japan and Australia, are important global players in terms of growth, market, technology, resources and diplomacy. They have the potential to shape the discussions around trade and investment, policy coordination and setting global strategies for the critical mineral chains at Minerals Security Partnership (MSP). In May 2023, QUAD leaders together called for "diversifying clean energy supply chains in the Indo-Pacific."



Creating an Open Market

India's efforts in creating an open market in the critical mineral sector are explicitly visible. In 2023, the country opened up its mines to private players through the amendment of its mining laws (The Mines and Minerals Development and Regulation Amendment Bill) to explore and mine potential untapped resources.⁶

⁵ Yellishetty Mohan, "Australia has rich deposits of critical minerals for green technology. But we are not making the most of them yet" The Conversation (UK), May 11, 2022, <https://theconversation.com/australia-has-rich-deposits-of-critical-minerals-for-green-technology-but-we-are-not-making-the-most-of-them-yet-182331>.

⁶ "Parliament Passes Mines and Minerals (Development & Regulation) Amendment Bill, 2023", Press Information Bureau, August 02, 2023, <https://pib.gov.in/PressReleasePage.aspx?PRID=1945102>.

Private companies have been granted permission to mine six additional minerals that were previously reserved for the state agencies. The minerals include lithium, beryllium, niobium, titanium, tantalum and zirconium, all of which are identified as critical minerals.

The e-auction of 20 mineral blocks in November 2023, and the recent announcement for the auction of 100 onshore critical mineral blocks in February 2024 along with 15 offshore blocks in March 2024⁷ are important steps forward in building a resilient critical mineral supply chain in the Asia-Pacific region. Additionally, the Union Mines Ministry has drafted new mining rules which aim to check monopoly over critical mineral bids. One applicant can submit only a single bid in an auction of a mineral block and none of its affiliates will be allowed to enter the same auction.⁸

Government Support and Incentives

Attracting big private players is difficult in the critical mineral domain due to the small market size compared to coal, iron, and copper. To overcome this obstacle, QUAD countries have offered incentives to private players. In 2023, to enhance the exploration of critical minerals, the Government of India announced a 25 percent incentive on the approved project cost for exploration agencies.⁹

The Government of Australia committed in the same year to double the critical mineral funding, making it US\$1.26bn (AUD\$2bn)¹⁰ and Japan proposed to bear 50 percent of the cost of the projects to secure Lithium supply.¹¹

⁷ Anand Sourav, "India gears up for major mineral auction", ET Energy World (New Delhi), December 20, 2023, <https://energy.economictimes.indiatimes.com/news/coal/india-gears-up-for-major-mineral-auction-100-blocks-by-february-2024-15-offshore-by-march/106138582>.

⁸ Mishra Twesh, "Centre notified mineral auction rules to cap upfront payments", The Economic Times (New Delhi), January 22, 2024, https://economictimes.indiatimes.com/industry/indl-goods/svs/metals_mining/centre-notified-mineral-auction-rules-to-cap-upfront-payments/articleshow/107057544.cms?from=mdr.

⁹ "Ministry of Mines Year End Review 2023", Press Information Bureau, December 29, 2023, [https://pib.gov.in/PressReleaseframePage.aspx?PRID=1991445#:~:text=\(vi\)%20NMET%20has%20announced%20an,critical%20minerals%20and%20fertilizer%20minerals](https://pib.gov.in/PressReleaseframePage.aspx?PRID=1991445#:~:text=(vi)%20NMET%20has%20announced%20an,critical%20minerals%20and%20fertilizer%20minerals).

¹⁰ "\$2 billion critical minerals boost crucial to energy transition", Australian Ministry of Resources, October 24, 2023, <https://www.pm.gov.au/media/2-billion-critical-minerals-boost-crucial-energy-transition>.

A similar stance was taken by the US in 2022 where the government announced US\$675mn under the Bipartisan Infrastructure Law Programme for the expansion of the domestic critical mineral supply chain. In the same year, the government announced an additional funding of US\$156mn to develop a critical minerals refinery.¹²

International Negotiations

India is strategically negotiating with international governments to secure the supply of critical minerals through its significant offshore reforms. India signed long-term security over critical minerals through the Australia-India Economic Cooperation Trade Agreement in 2022 and also became a member of the US-led MSP in June 2023.



¹¹ "Japan to subsidize half of the costs for lithium and key mineral projects", Nikkei Asia, April 23, 2023, <https://asia.nikkei.com/Economy/Japan-to-subsidize-half-of-costs-for-lithium-and-key-mineral-projects>.

¹² Clean Energy Infrastructure, *Infrastructure News*, 2022, <https://www.energy.gov/infrastructure/listings/infrastructure-news?page=1>.

The Government of India has established a joint venture between three public companies: National Aluminium Company (NALCO), Hindustan Copper Ltd. (HCL) and Mineral Exploration and Consultancy Ltd. (MELC), under the name of Khanji Bidesh India Ltd. (KABIL) to engage with several state-owned organisations in the countries like Argentina and Australia through the Ministry of External Affairs and the Indian Embassies to acquire critical minerals overseas.¹³

The mining-friendly environment of Australia offers enormous scope for critical mineral extraction and collaboration with Indian miners. Rawmin Pvt. Ltd., an India-based family enterprise operating in Australia in a Bauxite joint venture sets an example for other companies, especially small and medium ones to enter the critical mineral market.

Australia is expanding its reach to African countries to access critical mineral reserves, as evident in a recent lithium deal with Ghana by Australian firm Atlantic Lithium.¹⁴ Reflecting QUAD's interest in unlocking global reserves, careful examination of historical exploitation loopholes is crucial in the African context to ensure the owner country gets a fair deal.

Technology and Knowledge Sharing

The refining industry of critical minerals is highly concentrated. For example, China controls 65 percent of cobalt refining, nearly 60 percent of lithium refining, and as much as 95 percent of manganese refining. QUAD can offer a platform for technology sharing to develop refining processes in the Asia-Pacific region, making the market more competitive. The recent India-US collaboration to jointly develop technologies to process critical minerals is in line with it.¹⁵

¹³ "KABIL to ensure consistent supply of critical, strategic minerals to domestic market", ET Government, December 12, 2023, <https://government.economictimes.indiatimes.com/news/economy/kabil-to-ensure-consistent-supply-of-critical-strategic-minerals-to-domestic-market-minister/105917066>.

¹⁴ "Ghana greenlights first lithium mine with an eye on electric vehicle boom", Reuters, October 19, 2023, <https://www.reuters.com/world/africa/ghana-greenlights-first-lithium-mine-with-eye-electric-vehicle-boom-2023-10-19/>.

¹⁵ Vishnoi Anubhuti, "India, US working on tech to process critical minerals", The Economic Times (New Delhi), January 13, 2024, <https://economictimes.indiatimes.com/news/economy/foreign-trade/india-us-working-on-tech-to-process-critical-minerals/articleshow/106783734.cms?from=mdr>.

Creating a vast global knowledge network is also essential through the collaboration and cooperation of various relevant ministries and academia across the countries. The individual Memorandum of Understandings signed by the Monash University (Australia) with the Indian Institute of Technology Hyderabad (IITH) and with the International Centre for Excellence in Mining Safety and Automation (iCEM) in Gujarat, India, are noteworthy progress in this direction.¹⁶

Optimal Utilisation of Resources

Australia is well equipped with environmental standards in mining and technological advancement. Therefore, Australia must take insights from countries like Sweden and South Africa to utilise mine waste and byproducts from discards to extract critical minerals. Around five million tonnes of copper can be found in tailings waste in Australia that the country can tap¹⁷ and set a model for the other QUAD countries. However, the cost angle has not been explored much and requires substantial attention to understand the feasibility of such processes.

Conclusion

The above discussion tells us that the critical mineral supply chain in Asia-Pacific is evolving through new deals, reforms, and negotiations, using the strategic partnership of QUAD. The future critical mineral landscape in this region looks promising as evident from the efforts made by individual nations. QUAD countries are pushing for global discussions around favourable trade, investment, and policy coordination, demonstrating steps towards a resilient supply chain and strengthening the position of the Asia-Pacific region in MSP.

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February 2024

¹⁶ "Australia-India Critical Minerals Research Hub established furthering sustainable mining practice", Monash University, November 08, 2023, <https://www.monash.edu/news/articles/australia-india-critical-minerals-research-hub-established-furthering-sustainable-mining-practice>.

¹⁷ Burton Melanie, "Miners tap waste for critical minerals", Reuters (Brisbane), June 28, 2023, <https://www.reuters.com/sustainability/miners-tap-waste-critical-minerals-2023-06-28/>.