



खान मंत्रालय
MINISTRY OF
MINES

National Critical Mineral Mission



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ABBREVIATIONS

ANRF-Anusandhan National Research Foundation

C-o-E – Centre of Excellence

CBAM – Carbon Border Adjustment Mechanism

CL – Composite Licence

CSIR – Council of Scientific and Industrial Research

CMLTS – Critical Mineral Labelling and Traceability System

CO₂ – Carbon Dioxide

CSO – Civil Society Organisations

DRC – Democratic Republic of Congo

DST –Department of Science and Technology

E-o-L – End of life

EI – Exploration Incentive

EL – Exploration Licence

EPEAT – Electronic Product Environment Assessment tool

EU – European Union

FTA – Free Trade Agreement

Gol – Government of India

GRI – Global Reporting Initiative

GSI – Geological Survey of India

HML – Harmonised Master List

IIT –Indian Institute of Technology

IPEF – Indo-Pacific Economic Framework

IRA – Inflation Reduction Act

LiFE – Lifestyle for Environment

ML – Mining Lease

MoM – Ministry of Mines

MSDE-Ministry of Skill Development and Entrepreneurship

MSP – Mineral Security Partnership

NCMM – National Critical Minerals Mission

NDC – Nationally Determined Contributions

NIT– National Institute of Technology

PLI – Production-linked Incentive

PSU – Public Sector Undertakings

R&D – Research and Development

S & T – Science and Technology

STEM – Science, Technology, Engineering and Mathematics

U.K. – The United Kingdom

U.S. – The United States of America



1. VISION

Hon'ble Union Finance Minister announced setting up of 'Critical Mineral Mission' in the Union Budget speech 2024-25 on 23.07.2024. The relevant text of the speech is reproduced below-

"We will set up a Critical Mineral Mission for domestic production, recycling of critical minerals, and overseas acquisition of critical mineral assets. Its mandate will include technology development, skilled workforce, extended producer responsibility framework, and a suitable financing mechanism."

Accordingly, the National Critical Mineral Mission (NCMM) will be set up for seven years from 2024-25 to 2030-31 with the following vision-

"As India embarks on the journey of Viksit Bharat 2047, minerals will continue to play an important role for the nation's progress. The National Critical Mineral Mission (NCMM) envisions securing a long-term sustainable supply of critical minerals and strengthen India's critical mineral value chains encompassing all stages from mineral exploration and mining to beneficiation, processing, and recovery from end-of-life products. The NCMM seeks to develop a holistic action plan through strategic interventions in the form of policy reforms, financial support, infrastructure facilities, human resource development, technological advancements and international collaboration. The Government's aim is to build a globally competitive and resilient critical mineral ecosystem for India."



2. BACKGROUND

2.1 Overview of Critical Minerals

- 2.1.1** Mineral resources have been fundamental to the development of human civilisation. For centuries, minerals have been used for diverse set of applications in the sectors such as trade, tools, infrastructure, agriculture, technology, energy and defence. Such varied use of minerals has led to economic growth, technological progress, and societal development throughout the history of mankind.
- 2.1.2** Critical minerals are the foundation of contemporary industrial economies, enabling technological advancements and boosting economies. They are defined as a set of naturally occurring elements and compounds that have diverse irreplaceable industrial applications but confront supply-related vulnerabilities either in the form of their limited geographic occurrences or sourcing challenges.
- 2.1.3** India's commitment to achieve net-zero emissions by 2070 includes ambitious targets outlined in its Nationally Determined Contributions (NDCs). By 2030, India aims to have at least 50% of its cumulative installed power capacity sourced from non-fossil fuels, while simultaneously reducing CO₂ emissions by 1 billion tonnes and lowering carbon intensity to below 45%. The transition towards decarbonisation, particularly in the energy sector, is expected to drive significant demand for critical minerals. As the energy transition progresses, there will be increased demand for critical minerals to support the manufacturing of electric vehicles, wind and solar energy projects, and battery storage systems.
- 2.1.4** There is a need to recognise the importance of certain critical minerals, such as Potash, which play an important role in food production and processing value chains in India. Food security is paramount to the welfare agenda of the state and as such securing the supply of minerals needed for food production is important. Moreover, there is a reliance on the import of select minerals embedded in the food production industry and therefore the central Government shall focus on domestic production and securing the supply of such minerals.
- 2.1.5** India's strategic and defence sector also needs critical minerals for the manufacturing of defence equipment. Domestic production and sourcing of these minerals for nuclear and defence applications is also paramount. The applicability of critical minerals across energy, food, telecommunication, electronics, defence amongst other sectors makes the development of domestic industry and resilience of global supply chains an urgent policy necessity.
- 2.1.6** Critical mineral resources across the world are geographically concentrated with at least 55% of each of the identified critical minerals found in only 15 countries, as of date. A significant amount of lithium reserves is found in Latin American countries. The Democratic Republic of Congo (DRC) has almost 50% of the world's cobalt reserves. Indonesia and the Philippines have abundant nickel and cobalt reserves, with Indonesia standing out as a global leader in nickel reserves. Moreover, China produces about 60% of rare earth elements (REE) and molybdenum, while covering for almost 85% processing of much of the overall global rare earth supply. According to IEA, although mining operations for critical minerals have become more geographically diverse, little has changed for refining facilities. China controls 50% of planned lithium chemical plants, while Indonesia dominates with 90% of planned nickel refining facilities. India is a major producer of minerals like graphite and silicon, with reserves of select critical minerals with potential for further development. Therefore, India needs to develop an Indigenous critical minerals value chain along with addressing sourcing

¹Identified minerals include Cobalt, Copper, Graphite, Lithium, Manganese, Nickel and Rare Earth Elements

challenges due to current global natural resource endowments, incumbent global mining and processing industrial base, regulatory barriers, and protectionism.

2.2 Reforms on Critical Minerals

2.2.1 Based on the inter-ministerial consultations and well-crafted methodology capturing the Economic Importance and Supply Risk, the Ministry of Mines released a list of 30 critical minerals in June, 2023. Their applications and uses span across various industries right from manufacturing of clean energy components to electronics, telecommunication, aerospace, defence, chemicals, fertilizers, etc. Out of these thirty elements, fourteen have been highlighted for having both high economic importance as well as high supply risks. Seven have been categorised as elements of high supply risks and nine as elements with high economic importance.

2.2.2 As per the provisions of the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act), mineral concessions are auctioned by the State Governments. Some of the minerals identified as critical minerals were in the list of atomic minerals under the MMDR Act and hence their exploration and mining was reserved only for Government companies. In order to prioritise their exploration and mining, the MMDR Act was amended in August 2023. Through the amendment, 6 minerals, viz., lithium, beryllium, titanium, niobium, tantalum and zirconium, were removed from the list of atomic minerals thereby enabling the participation of private entities in exploration and mining of these critical minerals. A new list of 24 critical and strategic minerals (Appendix) was added in the MMDR Act which also includes the 6 minerals removed from the list of atomic minerals. The Central Government has been empowered to auction the blocks for these critical and strategic minerals. The amendment in the Act also introduced provisions for grant of a new mineral concession, namely, Exploration Licence (EL). Exploration Licence granted through auction shall permit the licence holder to undertake reconnaissance and prospecting operations for 29 critical and deep-seated minerals specified in the newly added Schedule to the Act. Out of these, 29 minerals, 23 are critical minerals. This amendment is expected to provide conducive legal environment for attracting foreign direct investment (FDI) and junior mining companies in the country. The government has also instituted a mechanism to share the project costs associated with critical minerals projects undertaken by Exploration Agencies under the Exploration Licence (EL) regime. This provision will encourage the industry to participate in the exploration of critical minerals and help increase the domestic production base of the country.

2.2.3 In addition to the reforms brought in the MMDR Act, which applies to the minerals found in the land, the statute for development and regulation of minerals in the offshore areas of the country, viz., the Offshore Areas Mineral (Development and Regulation) Act, 2002 (OAMDR Act), was also amended in August 2023. The offshore areas of country, which includes the territorial waters, continental shelf, exclusive economic zone and other maritime zones of India, contains promising resources of critical minerals such as heavy placer minerals (containing REE and titanium), phosphorite and polymetallic nodules and crusts (containing cobalt, nickel, etc.). The amendment in the OAMDR Act introduced auction as methodology of allocation of offshore mineral blocks. The Central Government is geared up to initiate auction of offshore mineral blocks in 2024 itself by enabling exploration and mining of offshore minerals for the first time in the country. The amendment in the Act also provided for establishment of the Offshore Areas Mineral Trust for funding for exploration, subsea survey, research, organizing capacity building programmes to raise technical capability of personnel, encouraging and assisting international co-operation in knowledge and technology exchange programmes, etc.

2.3 International Policy Outlook on Critical Minerals

2.3.1 The policies of major economies are focused on building sovereign capabilities in critical minerals' value chains, while creating jobs and economic opportunities. They emphasise leveraging private capital and innovation to diversify and expand clean energy supply chains. The United States' Inflation Reduction Act (IRA), the European Union's Critical Raw Materials

Act and Japan's Economic Security Act are some examples. These policies seek to incentivise local or regional supply chains through tax credits, Government investments, tariffs, and non-tariff regulations. Matured markets are utilising their competitive advantage in terms of technology readiness, human resources, international influence, and partnerships, to achieve emission reduction and energy security.

- 2.3.2** The approach of major producers of critical minerals such as the African Union is to move from raw material production to focus on value addition, and increased participation in the global value chains. In Latin America, Chile has developed a National Lithium Strategy, focusing on attracting investments and developing of lithium value chain. Argentina intends to promote value addition in both upstream and downstream segments concerning Lithium. In Brazil, the policy supports projects to produce identified "strategic minerals", while in Peru, there is a focus on the country's significant reserves of copper. Overall, the producer countries want to enhance value creation and integrate into global supply chains, thereby diversifying beyond raw material extraction.
- 2.3.3** The national strategies of major markets for critical minerals aim to create a robust and secure critical minerals value chain. The U.S. wants to secure access to critical minerals through trade and investment and fostering international partnerships. Australia wants to become a globally significant producer of raw and processed critical minerals by 2030. The U.K. focuses on diversifying supply across the world, mitigating risks and improving the resilience of critical mineral supply chains. The European Union envisions local production as key for its energy and mobility systems overhaul and the creation of the Critical Raw Materials Club to strengthen global supply chains.
- 2.3.4** The need for "reliable, responsible and sustainable supply chains of critical minerals" has been reiterated across multilateral forums across the world. Similarly, regional groups such as the Mineral Security Partnership (MSP), and the Indo-Pacific Economic Framework for Prosperity (IPEF) have developed frameworks to collaborate on critical minerals. India has also developed bilateral engagement with countries such as Australia, Argentina, and Chile for critical minerals.
- 2.3.5** Under the UN Secretary-General's Panel on Critical Energy Transition Minerals, four workstreams have been decided, namely, (i) benefit-sharing, local value addition and economic diversification (ii) transparent, fair trade and investments (iii) sustainable, responsible, and just value chain and (iv) mineral supply stability. International governments, non-government organisations and other relevant stakeholders are trying to reach a consensus and develop a global governance ecosystem on issues related to critical minerals value chains.

2.4 India's Comparative Advantage

- 2.4.1** India has considerable reserves of select critical minerals and further exploration of critical minerals has been proactively undertaken by the Government. India has an ever-increasing domestic demand for low-carbon technologies, indicating the potential for a large critical minerals market. The prospects of upcoming supply along with a significant domestic demand base may lead to increased participation in global value chains. Additionally, India has a strong base of mining and manufacturing industries, catering to sectors such as steel, cement, aluminium, etc.
- 2.4.2** India has a strong network of Government and private research labs. The nation is also building a strong skill base in geological sciences, mineral exploration, mining, and processing by increasing seats in premier national institutes such as IITs, NITs, Central, State and private Universities. India also has one of the highest numbers of STEM graduates in the world. Furthermore, Skill India Mission is implementing the craftsmen training scheme in Industrial Training Institutes (ITI) in trades, including mining and mineral processing which will increase the availability of workforce in the sector. Similarly, several polytechnic institutes in India is one of the resource for providing technical & skilled human resource. India's easy availability of skilled labour can also help maintain a competitive cost of the critical mineral value chain globally.

3. Mission Objectives

The Mission envisions the establishment of a comprehensive framework to develop a robust critical mineral supply chain to support the nation's goals of boosting economic activities, combating climate change, guaranteeing food security and ensuring sustainable development for all. The Mission will be applicable to 24 critical minerals identified by the Government of India in June 2023 (Annexure I) and will include any minerals that are subsequently added or changed from the list over time.

The National Critical Mineral Mission aims to achieve the following **two objectives-**

- i) **To secure India's critical mineral supply chain** by ensuring mineral availability from domestic and foreign sources.
- ii) **Strengthening the value chains** by enhancing technological, regulatory, and financial ecosystems to foster innovation, skill development, and global competitiveness in mineral exploration, mining, beneficiation, processing, and recycling.

In pursuit of the Mission objectives, the Government will strategically implement seven pivotal measures alongside some concurrent initiatives each serving as a cornerstone for elucidating action points that constitute the Mission's essential components, namely

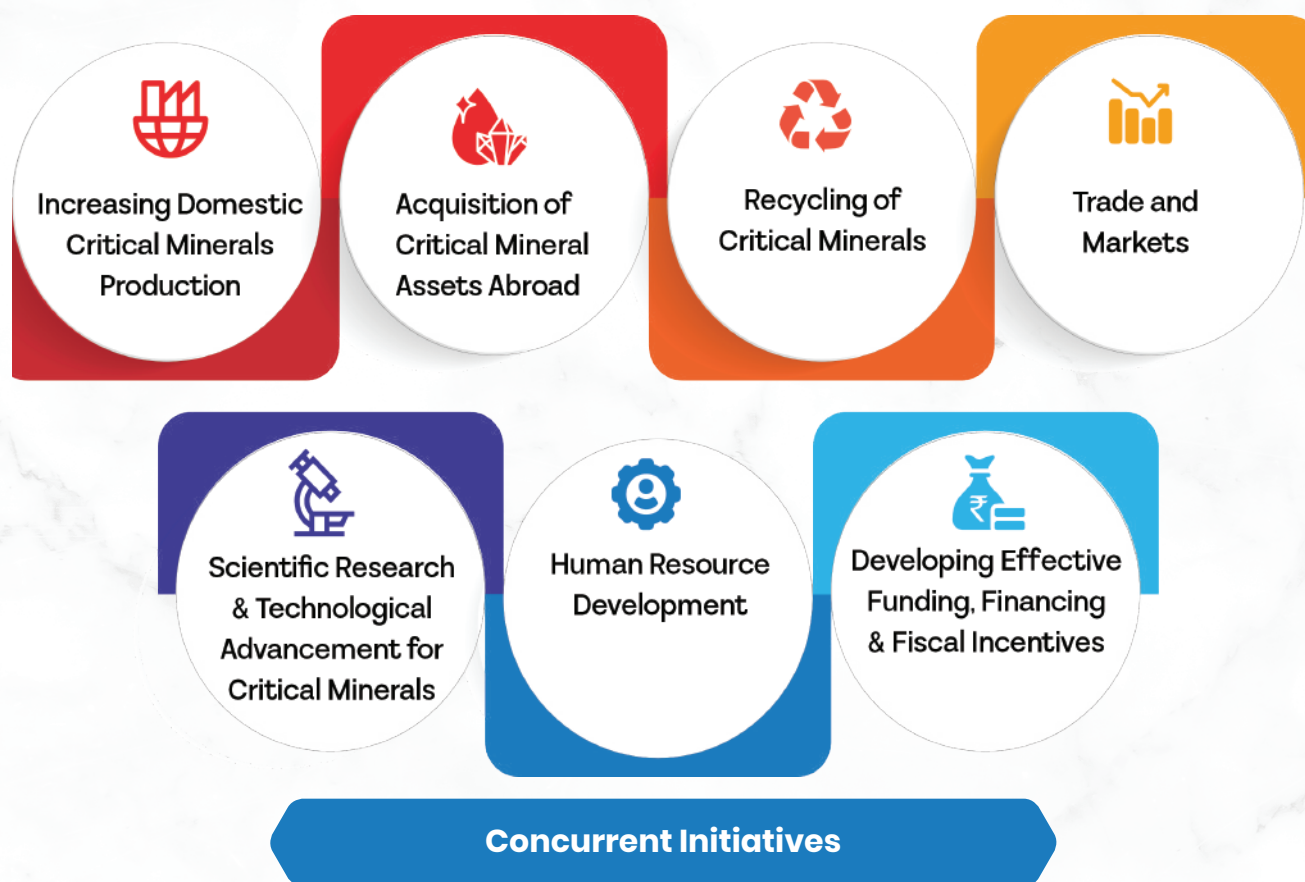
- i) Increasing Domestic Critical Minerals Production
- ii) Acquisition of Critical Mineral Assets Abroad
- iii) Recycling of Critical Minerals
- iv) Trade and Markets
- v) Scientific Research & Technological Advancement for Critical Minerals
- vi) Human Resource Development
- vii) Developing Effective Funding, Financing and Fiscal Incentives

Each one of these measures will encompass a range of specific interventions tailored to its respective needs. These interventions can be broadly categorized into seven broad heads;

- i) **Whole-of-Government approach:** The government will adopt a whole-of-government approach, to promote collaboration, integration and efficient programme management for the Critical Minerals Mission.
- ii) **Policy change:** The government shall undertake policy change to further exploration, extraction, beneficiation, processing, and recycling of critical minerals.
- iii) **Financing:** The government will enable financial incentives to support the development of critical minerals in India and acquire assets from international sources to satisfy market and strategic demand.
- iv) **Infrastructure Development:** The government will assist in the creation/procurement of equipments/pilot plant setup and supporting research, civil and logistics infrastructure for critical minerals.
- v) **Human Resource Development:** The government shall undertake capacity building across the critical minerals value chain, to develop human resources to service the sectoral requirements.
- vi) **Technology:** The government will create an enabling ecosystem for research and development (R&D) in the country, focusing on technology creation, collaboration and transfer across the value chain.
- vii) **International Collaboration:** The government shall leverage coordination and collaboration with international partners to secure and strengthen India's critical minerals supply chains.

4. Mission Components

The National Critical Mineral Mission comprises several key components designed to ensure a **sustainable, resilient, and self-reliant critical minerals** value chain in India. These components are structured to address short, medium and long-term goals, aligning with the broader vision of **Atmanirbhar Bharat and Viksit Bharat**. The Mission components will be implemented in a manner that addresses immediate needs, while laying the groundwork for long-term sustainability.



4.1 Increasing Domestic Critical Minerals Production

- 4.1.1 Expanding Exploration and Mining activities:** The Government agencies shall undertake 1200 exploration projects between FY 2024-2025 to FY 2030-2031. Moreover, to scale up mining activities, more than 100 blocks of critical minerals resources will be auctioned by FY 2030-2031. The government will also enhance the expenditure from the National Mineral Exploration Trust (NMET) through public sector and notified private exploration agencies in the exploration of critical minerals blocks. To this extent, **INR 3,000 Crores (until FY 2030-2031)** will be allocated for critical minerals exploration under NMET by enhancing the existing budget. Additionally, the Geological Survey of India will aim to spend **INR 4,000 Crores (until FY 2030-2031)** for critical minerals exploration in the country from its regular budget.

- 4.1.2 Mining in offshore areas:** The OAMDR Act has recently been amended through the OAMDR (Amendment) Act, 2023 w.e.f. 17.08.2023 which brought major reform by introducing auction as the method of allocation of operating rights in the offshore areas. Offshore blocks of polymetallic nodules & crusts contain minerals like Cobalt, REE, Nickel, Manganese etc. have been explored and have been put up for auction recently. Enhanced efforts will be made to explore more critical mineral bearing blocks in offshore areas and start mineral production.
- 4.1.3 Critical Minerals Regulatory Support Programme:** To expedite the transition from critical minerals exploration to mining operations, a streamlined approach to regulatory requirements and permissions is imperative. The government shall endeavour to create a fast-track regulatory approval process for domestic critical minerals exploration and mining projects, given the strategic importance of the sector.
- 4.1.4 Concession for Private Exploration:** The Government has introduced a new concession viz; **Exploration Licences (EL)** for encouraging private participation in exploration activities. The Government will share the risk of Exploration Licences holders through an already notified scheme for partial funding of exploration expenses. Similarly, a scheme has been notified for partial funding of exploration expenses of Composite Licence (C.L.) holders. Government shall make the necessary changes in the scheme, if required.
- 4.1.5 Recovery of Critical Minerals from overburden/tailings/fly ash/red-mud etc.:** Promoting recovery of the critical minerals from mine tailings by using technologies like hydrometallurgy, solvent extraction, electrochemical and bio-hydrometallurgy or bioleaching processing etc. which can be a low cost and potential secondary source. The regulatory regime will be relaxed to encourage optimum recovery of critical minerals from various sources such as overburden, tailings, fly ash, red mud, existing mines etc. Moreover, as several critical minerals are associated with major minerals, the Government will design a lower revenue share for critical minerals associated with major minerals. To promote the ecosystem, the government will allocate **INR 100 Crores** during the Mission period for setting up pilot projects for mineral recovery through novel methods by encouraging collaborations between industry, academia and research institutions.



- 4.1.6 Assessment of Trace Elements/Critical Minerals during Exploration:** It is important to ensure that exploration and mining companies, both the government and private, while taking up exploration, take up required investigation for identification and assessment of all possible minor or associated minerals which may genetically co-exist with the major minerals being explored. The government will enable collaboration across ministries to integrate data with the National Geoscience Data Repository (NGDR) portal for optimum assessment of trace elements/critical minerals. Efforts will also be made to re-examine the already explored exploration data, preserved rock core and rock samples etc. for assessment of possible association of critical minerals co-existing with the major/minor, minerals being mined principally. The NCMM along with agencies like GSI, and IBM prepare SOP/guidelines to facilitate the assessment.
- 4.1.7 Formation of Mineral Processing Parks using existing infrastructure:** To build domestic critical minerals processing capabilities the government will create mineral processing parks to house mineral processing industries. A scheme will be prepared by the Ministry of Mines in consultation with Ministry of Finance. Efforts will be made to utilise existing industrial parks if available. The government aims to **allocate INR 500 Crores by FY 2030-2031 to support such parks.** The government will also work to foster Research and Development (R&D) for beneficiation and processing of critical minerals, mineral reagents, electrolytes, catalysts, bleaching agents etc.
- 4.1.8 Role of State Governments:** States will be encouraged to expedite the granting of various statutory clearances for critical minerals exploration and mining projects. The State Governments shall also promote exploration, mining, processing, and R&D in the critical minerals value chain through Mission and infrastructure support. Additionally, the State Public Sector Undertakings (PSUs) will be encouraged to actively participate in acquiring mineral assets abroad or make financial investments to support other Central PSUs.
- 4.2 Acquisition of Critical Mineral Assets abroad**
- 4.2.1 Mapping and Acquisition of Significant Critical Mineral Assets:** The Mission will extend support for mapping and detailed exploration of critical mineral assets in resource-rich countries through the Geological Survey of India (GSI), PSUs or other Indian entities with the objective of supplying minerals to India. Indian entities shall be encouraged to collaborate with partners in international exploration and acquisition projects. **The NMET is expected to spend INR 1600 Crores up to FY 2030-2031, to support critical minerals exploration activities outside India.**
- 4.2.2 PSUs and private companies in Overseas Critical Mineral Assets Acquisition:** The Government of India will motivate the Central Public Sector Undertakings (PSUs) and encourage private sector companies to allocate funds for the acquisition of critical mineral assets overseas. The **Empowered Committee** will give broad directions and inter-ministerial support to PSUs and stakeholders to acquire critical mineral assets abroad. The Government of India will empower the Central Public Sector Undertakings (PSUs) and their Joint Ventures (JVs), subsidiaries to invest in mineral assets abroad by issuing necessary guidelines. The PSUs will take commercial decisions in making investments to abroad. It is expected that PSUs and other companies will invest around INR 2500 crores per year in critical mineral assets abroad which will cumulatively lead to an investment of around **INR 18,000 Crores by FY 30-31.**
- 4.2.3 Facilitation of PSU-led Asset Acquisitions with Private Sector Collaboration:** The Government of India will facilitate central PSUs in leading asset acquisitions in association with private companies contributing capital and sharing revenue. Equity participation by Central Public Sector Undertakings (PSUs) can provide financial support while sharing the risk, fostering a collaborative environment whereas, offtake agreements will secure supply security to Indian manufacturing. Private companies will have option to go solo or JV with PSUs This initiative will encourage central PSUs and private industries to enter the critical minerals sector, enhancing domestic processing and production capabilities. Additionally, collaboration with foreign countries and companies will be fostered to meet the needs of domestic downstream industries.

4.2.4 Encouraging Indian companies through targeted Financial Support: With the aim of increasing supply of critical minerals to India, encourage the participation of Indian public and private sector companies in the acquisition of assets abroad, the Government will provide targeted subsidies for mining and for setting up evacuation infrastructure. Subsidies can lower the risk in investment made for mine development and resource retrieval. **The Government will allocate INR 4,000 Crores for such projects up to FY 2030-2031 from NMET.** In this regard, the Mission will formulate detailed scheme. The companies can avail subsidies as may be allowed under scheme.

4.2.5 Infrastructure Support: The Ministry of Mines will work very closely with the Ministry of External Affairs to engage with the regulators from the resource country to support the development of mineral evacuation infrastructure.

4.3 Recycling of Critical Minerals

4.3.1 Guidelines/SOPs for Recycling of Critical Minerals: Formulation of separate guidelines/SOPs for recycling of critical minerals to streamline the informal mineral recycling sector in the country. Best practices from the Extended Producer Responsibility (EPR) norms for plastics and e-waste management in India will be considered while designing the guidelines for critical minerals. The NCMM will support EPR regulations through analytical studies and the development of innovative solutions to secure and optimize the critical minerals' supply chain.

4.3.2 Incentive scheme for Recycling of Critical Minerals: An incentive scheme for setting up minerals recycling clusters shall be prepared by the Ministry of Mines in consultation with Ministry of Finance. The scheme will identify targets for the production of recycled minerals for the medium and long-term and distribute the incentives to interested industries accordingly. The quantum of incentive for the scheme is pegged at **INR 1500 Crores.**

The proposed scheme will cover Lithium, Nickel, Cobalt, Graphite, PGE, REE, Antimony, Cadmium, Gallium, Germanium, Indium, Molybdenum, Selenium, Silicon, Strontium, Tellurium, Tin, Titanium, Tungsten, Vanadium and Zirconium.

4.3.3 Formation of Recycling Advisory Group for Critical Minerals: Formation of a Recycling Advisory Group to assess the presence of different critical minerals in domestic and imported products and suggest necessary measures for optimum recovery of critical minerals from these products.

4.4 Trade and Markets

4.4.1 Enhance Trade with Resource-Endowed Countries: There is a need to increase engagement with resource-rich countries on trade and investments across critical mineral value chains to ensure long-term security and sustainability. The government shall aim to enter into Critical Minerals Partnership Agreements (CMPA) with resource-rich countries. The government will also work to include critical minerals chapters in existing bilateral/Free Trade agreements with countries of interest.

4.4.2 Harmonise Tariffs through Bilateral FTAs: Bilateral free trade agreements (FTAs) can address harmonising tariff structures to facilitate ease of trade. The government shall actively engage with stakeholders concerning revising critical minerals sector relevant Harmonised System (HS) codes in line with the World Customs Organisation (WCO) tentative HS code revision in 2027.

4.4.3 Eliminate a number of Import Duty on Critical Minerals: The government has eliminated import duty on critical minerals, based on strategic requirements, to facilitate easier flow of these essential resources into the country. Eliminating import duties will have several benefits. First, it will reduce the financial burden on domestic industries that rely on critical minerals, making them more competitive in the global market. Second, it will attract foreign investment by creating a more favourable business environment for companies involved in

the processing and utilisation of these minerals. Consequently, it will stimulate the growth of downstream industries by ensuring that critical minerals are readily available and affordable. Government will also periodically review the import duty on critical minerals based on their strategic requirement for the country.

4.4.4 Removal of Import Duty and Other Barriers on Recyclable Materials: To encourage the growth of the recycling industry and attract more companies to engage in processing and value addition for the domestic sector, import duties and other barriers on recyclable materials such as scrap, black mass, and e-waste shall be revisited. This effort will help in ensuring a steady supply of raw materials for recycling, fostering a favourable environment for businesses to thrive and contribute to domestic value addition. If any issue arises regarding the influx of unwanted e-waste, the government will take necessary measures to address and mitigate these challenges effectively. The focus will remain on building a robust recycling infrastructure that not only supports the economy but also adhere to environmental standards.

4.4.5 Develop National Critical Minerals Stockpile/Reserves: Identification of essential critical minerals and establishing mechanisms for timely activation of the stockpile through interactions with industry stakeholders and Government agencies to coordinate emergency response efforts and ensure stockpile utilisation is important. A joint initiative between central PSUs or with private companies shall be institutionalised to develop a National Critical Mineral Stockpile Programme, for stockpiling critical and strategic minerals, to guard against supply disruptions and aid mineral supply for domestic utilisation. To develop the National Critical Minerals **Stockpile/Reserves**, the government will allocate **INR 500 Crores** during the Mission period for this purpose. Guidelines for the program will be prepared in consultation with Ministry of Finance.

4.5 Scientific Research & Technological Advancement for Critical Minerals

4.5.1 Promoting Research and Innovation in Critical Minerals: Support the deployment of state-of-the-art extraction, processing, and recycling technologies by leveraging domestic R&D infrastructure and existing commercial solutions. The Government will seek to support the patent filing procedures for innovators, start-ups, and enablers through improving coordination among institutions/organisations such as the Council of Scientific and Industrial Research (CSIR), Indian Institute of Technology (IIT), Indian Institute of Science (IISc), and others. These integrating efforts are aimed at tackling the emerging innovative and technological challenges to the critical minerals sector. The government will **allocate INR 500 Crores till FY 2030-2031 for promoting domestic Research and Development (R&D) in the country**. Additionally, industry-specific need analyses will be conducted from time to time to guide efforts in bridging R&D gaps essential for achieving technology commercialisation at scale.

The funding for R & D will be arranged from the Anusandhan National Research Foundation (ANRF) of Department of Science & Technology and other R & D schemes as may be eligible under their guidelines.

4.5.2 Establishing Centers of Excellence (COE) on Critical Minerals: The Ministry also suggested the constitution of Centers of Excellence on critical minerals. The Centres shall work on a Hub and Spoke Model with institutions/organisations and research labs working on critical minerals. The Centers of Excellence (COE) will work on the critical minerals value and aim to synergise R&D and innovation with the national objectives. The existing infrastructure including manpower, of these organizations will be utilised for undertaking the proposed research work. If need be, the project related manpower will be hired on contract basis by these CoE.

4.5.3 Supportive Mechanisms and Regulatory Simplification: The government will simplify regulations and enhance collaboration with technology labs and academia to bolster local capabilities. Additionally, supportive mechanisms will be developed to overcome challenges

such as lead times for technology acquisitions, import duties, and skilled workforce requirements.

- 4.5.4 Global collaboration on R&D:** India will leverage existing technical advancements made by many countries and companies by working with them on technology R&D – especially on mineral processing. The government will earmark **INR 500 Crores** from ANRF and other R & D schemes as may be eligible under their guidelines, especially to focus on global R&D collaboration across the critical minerals value chain. Additionally, industry-specific need analyses will be conducted from time to time to guide efforts in bridging R&D gaps essential for achieving technology commercialisation at scale.

4.6 Human Resource Development

- 4.6.1 Promoting Expertise and Skilled Workforce in Critical Minerals:** To enhance human resource capacities and develop a skilled workforce capable of participating actively in the critical minerals value chain across, exploration, mining, processing, manufacturing and recycling, the government will establish Skill Development Centers, with an **allocation of INR 100 Crores till FY 2030-2031**. Scientific research institutes such as IITs, universities, research centres, private sectors etc. will be encouraged to facilitate research and training for workforce development by supporting PhD and Masters Programmes in Universities. Guidelines for providing assistance to the skill development centres will be prepared in consultation with Ministry of Finance and Ministry of Skill Development and Entrepreneurship (MSDE). Efforts will be also directed towards facilitating continuous skill upgrading and training programs for individuals already engaged in the critical mineral value chains.

- 4.6.2 Develop Targeted Degree Programs, Scholarships, and Internships:** In collaboration with the universities and technical institutions, the Government of India will develop and introduce specialised modules by 2026. These modules will specifically focus on sustainable consumption and production of critical minerals which will be incorporated into the existing mining, metallurgy and recycling technologies degree programmes.

- 4.6.3 Capacity Building Programs for Resource-Endowed Countries:** The Government will offer Capacity Building Programmes to resource-rich countries through GSI, MECL, IBM, Indian institutes and universities. These programs will enhance the capacities of these nations while creating a stable supply of critical minerals for India, fostering a win-win environment that benefits both parties through strengthened cooperation and mutual growth.

4.7 Concurrent Initiatives

- 4.7.1 Updating of Critical and Strategic Minerals List through continuous Risk and Demand Assessment:**

The government through CMM will periodically refine the criticality assessment framework based on supply risk and economic importance and accordingly update the list of critical minerals for India. Identification of long-term risks (such as price and demand fluctuations) for critical minerals due evolving technology landscape will be prioritised. Ministry of Mines with possible collaboration with entities such as the NITI Aayog will undertake the assessments of these risks and provide time-bound approvals. The Mission will also encompass demand assessments from time to time with the industrial and technological needs.

- 4.7.2 Development of a Traceability System for Critical Minerals:** The Government shall aim to develop a Critical Mineral Traceability system to enhance the tracking and monitoring of critical minerals in India. This initiative will offer transparent information on critical minerals' composition and related information in products. The broader aim of this initiative will be to empower consumers to make informed decisions on the use of critical mineral-intensive products.

- 4.7.3 Outreach and Public Awareness:** The Government will establish a Critical Minerals Forum and Outreach Program as a platform for collaboration and innovation within the sector.

Involving government entities, PSUs, private companies, CSOs, and other stakeholders, the forum will facilitate strategic discussions, international procurement initiatives, and investment attractions. Regular sessions, networking events, workshops, and knowledge-sharing initiatives will promote business expansion, financial investments, and technological advancements. The forum will also monitor global trends in critical minerals to help stakeholders stay informed and seize emerging opportunities.

4.8 Developing Effective Funding, Financing and Fiscal Incentives

The Mission has identified various avenues for the development of a critical minerals value chain in India, which will necessitate financial support. These include exploration, mining, processing, recycling projects, as well as investment in R&D and human resource development to foster innovation. The Ministry of Mines through GSI, NMET and S&T programmes already taking action towards the activities of the Mission. A substantial part of additional requirement of funds to carry out the activities envisaged under the Mission will be met through National Mineral Exploration Trust (NMET) funds. The corresponding amendment in the MMDR Act will be made to enable the National Mineral Exploration Trust to fund the proposed activities of the Mission. A part of fund required **i.e. INR 2600 crores** will be sought as additional budgetary support.

Further, the Mission will be open to receiving financial assistance, from international institutions and other sources for its activities. The Mission will encourage collaborative projects with other countries, and international institutions towards achieving its objectives.

As the activities of the NCMM ramp up in subsequent years, additional funding will be mobilised through multiple channels, including public, private, bilateral and multilateral entities ensuring a sustained financial support for the critical minerals sector.

4.8.1 Developing appropriate Fiscal Measures: To facilitate the financial ecosystem for the critical minerals in India, the Mission will make efforts to develop and implement a range of fiscal measures designed to incentivise junior exploration and mining companies. These measures may include the introduction of tax credits and soft loans for investments in critical minerals exploration and development, aimed at reducing the financial burden on companies, and making investments more attractive and feasible. Additionally, mechanisms to encourage investments in critical mineral exploration and mining with aim to lower the risk for investors while ensuring that companies have the essential capital needed will be developed. By integrating these fiscal measures with broader financial initiatives, the Mission aims to create a robust financial environment that supports the development of the critical mineral sector in India. Moreover, the Mission will pursue the inclusion of critical mineral value chain in the Harmonised Master List (HML) of Infrastructure sub-sectors as of F. No. 13/1/2017-INF.— of the Department of Economic Affairs, Ministry of Finance.

4.8.2 Leveraging funding from International Financial Institutions: The government will take steps for leveraging finances for the development of critical minerals. The government will also enable participation in international development programmes of institutions such as the World Bank, Asian Development Bank, and the International Monetary Fund etc. through initiatives like the Resilient and Inclusive Supply-chain Enhancement (RiSE) initiative and Advanced Sustainable Clean Energy Network for Development (ASCEND) amongst others. There will also be an emphasis on securing loans from multilateral financial institutions for the development of the sector.

4.8.3 Financial Outlay for the National Critical Mineral Mission: The Mission includes budgetary provisions for (i) Securing Domestic and Foreign Sourcing of Critical Minerals and (ii) Strengthening Critical Minerals Value Chains, with budgetary allocation for all the activities that are to be undertaken as part of the Mission. The administrative expenditure on the Mission will be borne by the budget of the Ministry. The amounts indicated in the Table-1 are for Mission activities.

Table 1: Proposed Expenditure on the Mission

Mission Objectives	Finance Heads		Source of Allocation	Total Allocation (INR crore) (FY 2024-25 to 2030-31)
Securing Domestic and Foreign Sourcing	Domestic Critical Mineral Exploration		NMET	3000
			GSI	4000
	Risk Coverage for foreign sourcing		NMET	4000
	Support for exploration activities outside India		NMET	1600
	Recycling	Incentive scheme for Mineral Recycling	Budget	1500
		Pilot Projects- Mineral Recovery	NMET	100
Strengthening Value Chains	R&D and Human Resource Development		ANRF & other R & D schemes	500
	International R&D Support		ANRF & other R & D schemes	500
	Skill Development Centres		Budget	100
	Critical Minerals Processing Parks		Budget	500
	Stockpiling of Critical Minerals		Budget	500
Grand Total				16300

Expected Investments by @PSUs, etc.	18000
@ PSUs- <i>Khanij Bidesh India Limited (KABIL), Coal India Ltd. (CIL), National Mineral Development Corporation (NMDC), NTPC Mining Ltd, Neyveli Lignite Corporation India Ltd (NLCIL), Steel Authority of India (SAIL), Indian Rare Earth Ltd (IREL), Oil India Ltd, ONGC Videsh Ltd (OVL). Other PSUs will also be encouraged to invest abroad in critical minerals.</i>	

4.8.4 Dovetailing with Existing Schemes: The financing mechanism proposed for Mission activities is based on a “whole of Government & Industries” approach. Certain activities are funded by the Government and many activities are taken up as commercial and business decisions by public and private sector companies. While formulating specific schemes and guidelines for financing the Government activities, it will be ensured that any existing scheme similar to the activities proposed is dovetailed into the Mission activities.

5. Mission Output and Outcome

The National Critical Mineral Mission will have yearly output targets for key budget heads mentioned in the section above. The details of the outputs and potential outcomes are mentioned below. The outputs can be tracked on yearly basis and will help us achieve our stated outcomes in the Mission.

5.1 Mission Output: Year wise anticipated output of the Mission is furnished in the table below:

Table - 2: Mission Output

Mission Objectives	Key heads		Total (FY 2024-25 to 2030-31)
Securing Domestic and Foreign Sourcing	Domestic Critical Mineral Exploration Projects		1200
	Foreign Critical Mineral Mines	PSUs	26
		Private Entities	24
	Incentive scheme for recycling - total materials recycled (kt)		400
Strengthening Value Chains	Patents in critical mineral value chain		1000
	Skill development		10000
	Mineral Processing Parks		4
	Centre of Excellence		3
	Mineral Stockpile (cumulative)		5

After the preparation of detailed guidelines, wherever required, the targets will be adjusted.



5.2 Mission Outcome

- **Expansion of Domestic Mineral Production:** The Mission will aim to complete **1,200 critical mineral exploration projects** and auction **100 critical mineral blocks by FY 2030-2031**. The aim is to ensure domestic production of at least **15 critical and strategic minerals** (such as graphite, lithium, potash, rare earth elements), thereby reducing import dependency and securing supply chains for critical industries.
- **Enhancing Self-Reliance in Critical Minerals:** We expect that the domestic critical mineral production will be able to meet up to **10% of the national annual demand for critical minerals by 2031**, contributing significantly to India's strategic objective of self-sufficiency.
- **Acquisition of Overseas Mineral Assets:** Indian companies will secure **at least 50 overseas mining assets** including key battery minerals including lithium, nickel, copper, cobalt, and graphite. These acquisitions will ensure a stable supply and are expected to **meet 5% of annual critical mineral demand by 2031**.
- **Fostering a Circular Economy through Recycling:** The Mission aims to **recycle at least 10% of the nation's annual consumption of critical minerals**, reinforcing a circular economy model and reducing the dependency on primary raw materials.
- **Advancing Innovation through Research and Development (R&D):** The Mission will support **100 domestic R&D projects** and numerous international collaborative initiatives, with the objective of advancing extraction, processing, and recycling technologies. This will include achieving self-sufficiency in the **processing of at least 5 critical minerals and generating 1,000 patents across the critical minerals value chain by 2031**.
- **Skilled Workforce Development:** The Mission will **create 10,000 skilled professionals**, specializing in the critical minerals sector—ranging from mining and processing to recycling—thereby equipping India's industries with the necessary human capital to drive growth and innovation.
- **Establishment of Centers of Excellence (CoE):** The Mission will work towards setting up of 3 Centers of Excellence (CoE) by 2031, to foster Research and Development (R&D) and Innovation through projects and pilots across the critical minerals value chain.
- **Creation of Regional Processing Hubs:** Establishment of **four regional mineral processing parks** across the country, aimed at strengthening domestic refining and processing capacities, reducing reliance on international processing centers, and fostering a vertically integrated supply chain.
- **Streamlined Regulatory Framework:** Implementation of expedited regulatory approvals for critical mineral projects, facilitating faster transitions from exploration to production and ensuring timely access to essential resources for strategic sectors.
- **Strengthening Global Partnerships and Cooperation:** The Mission will foster bilateral and multilateral partnerships with resource-endowed nations through strategic trade agreements and international collaboration, ensuring secure access to critical minerals and facilitating the exchange of advanced technologies in mineral processing and recycling.
- **Establishment of a National Stockpile:** Creation of a **National Critical Minerals Stockpile comprising at least 5 critical minerals**, designed to mitigate risks from global supply chain disruptions and ensure that essential minerals are available to meet domestic needs during emergencies.
- **Robust Governance and Oversight:** The formation of an Empowered Committee on Critical Minerals, supported by a dedicated Mission Secretariat, will provide strong governance and ensure the effective coordination of initiatives, enabling timely implementation and regular monitoring of the Mission's progress.

6. Governance Framework

6.1 Empowered Committee on Critical Minerals: The Ministry of Mines will be the administrative Ministry of the National Critical Mineral Mission. The Mission's activities will be coordinated by an Empowered Committee, chaired by the Cabinet Secretary and including members from relevant stakeholder ministries. The empowered committee shall-

- i) Monitor and review the activities of the Mission;
- ii) Give broad directions for investment in foreign countries and minerals;
- iii) Approve guidelines of sub-components; and
- iv) Approve changes in the Mission components as may be necessary to achieve the Mission objectives.

The Empowered Committee shall consist of the following members-

- i) Cabinet Secretary-Chairperson
- ii) CEO, NITI Aayog-Member
- iii) Secretary, Department of Expenditure-Member
- iv) Secretary, Department of Atomic Energy-Member
- v) Secretary, Ministry of Coal-Member
- vi) Secretary, Department of Commerce-Member
- vii) Secretary, Ministry of Heavy Industries-Member
- viii) Secretary, Department of Ministry of External Affairs-Member
- ix) Secretary, Ministry of New and Renewable Energy (MNRE)-Member
- x) Deputy National Security Advisor (DyNSA)-Member



- xi)** Secretary, Department of Scientific and Industrial Research (DSIR)-Member
- xii)** Secretary, Department of Science and Technology-Member
- xiii)** Secretary, Petroleum and Natural Gas-Member
- xiv)** Secretary, Ministry of Power-Member
- xv)** Secretary, Department of Public Enterprises-Member
- xvi)** Secretary, Ministry of Steel-Member
- xvii)** Secretary, Ministry of Mines-**Convener**/Member Secretary
- xviii)** Five Technical Experts to be nominated by the Chairperson.

6.2 Establishment of a Mission Secretariat: The Mission Secretariat will comprise a dedicated team led by the Joint Secretary, who will serve as the Mission Head. The Mission will also have a director, geologists, mineral economists, and professionals from the mining industry, mineral processing industry and finance. Secretariat will also have Under Secretary a Section Officer and support staff. Moreover, the Secretariat may include any other professionals as required to fulfil the Mission's objective.

The following permanent posts will support the Mission-

- 1)** One- Joint Secretary -Mission Head
- 2)** One-Director
- 3)** Two-STS Officers (Geology) from GSI*
- 4)** One JTS Officers (Mineral Economics) from IBM*
- 5)** One JTS Officer (Finance or Business Administration)
- 6)** One-Under Secretary
- 7)** One-Section Officer
- 8)** Two- ASO
- 9)** Two-MTS

*The officers at S.No. 3 and S.No.4 will be attached or called on deputation from Geological Survey of India (GSI) and Indian Bureau of Mines (IBM).

APPENDIX

Critical and Strategic Minerals specified in Part D of First Schedule of the MMDR Act [24 minerals]	
1. Beryl and other beryllium bearing minerals.	
2. Cadmium bearing minerals.	
3. Cobalt bearing minerals.	
4. Gallium bearing minerals.	
5. Glaucosite.	
6. Graphite.	
7. Indium bearing minerals.	
8. Lithium bearing minerals.	
9. Molybdenum bearing minerals.	
10. Nickel bearing minerals.	
11. Niobium bearing minerals.	
12. Phosphate (without uranium).	
13. Platinum group of elements bearing minerals.	
14. Potash.	
15. Minerals of the "rare earths" group not containing Uranium and Thorium.	
16. Rhenium bearing minerals.	
17. Selenium bearing minerals.	
18. Tantalum bearing minerals.	
19. Tellurium bearing minerals.	
20. Tin bearing minerals.	
21. Titanium bearing minerals and ores (ilmenite, rutile and leucoxene).	
22. Tungsten bearing minerals.	
23. Vanadium bearing minerals.	
24. Zirconium-bearing minerals and ores including zircon.	





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