Critical Minerals

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Why is in news? Mines Ministry to Unveil “List of Critical Minerals for India”

The Government of India, through the Ministry of Mines, is all set to unveil for the **first time "the list of Critical Minerals for India"** to **ensure reduced import dependencies**, enhance supply chain resilience and support the country's net zero objectives.

The release of the Critical Minerals List will mark a **milestone in India's pursuit of self-reliance and security** in the domain of mineral resources.

This meticulously compiled list is **designed to identify and prioritize minerals** that are essential for various industrial sectors such as **high-tech electronics, telecommunications, transport and defence**.

The list will serve as a guiding framework for policy formulation, strategic planning and investment decisions in the mining sector.

This initiative **aligns with the larger vision of achieving ‘Net Zero’ target** for India through Government's commitment to creating a robust and resilient mineral sector.

It is worthy to note that **India has recently become the newest partner in the coveted Mineral Security Partnership** (MSP) to bolster critical mineral supply chains.

Critical minerals of India:

Mineral commodities that **have important uses and no viable substitutes**, yet **face potential disruption in supply**, are defined as **critical to the Nation’s economic and national security**.

Critical minerals are the **building blocks of essential modern-day technologies**.

Uses of Critical Minerals:

While some such materials **provide inputs to traditional industries**, many are **crucial for high-tech products** required for clean energy, national defence, information technology, aviation and space research.

These minerals are now used everywhere from – Making mobile phones, Computers to batteries, Electric vehicles and Green technologies like solar panels and wind turbines.

Energy storage systems (ESS) for renewable energy and data transmission hardware.

Electric vehicles: cobalt, lanthanum, lithium

Fuel cells: platinum, palladium, rhodium

Wind energy technologies: neodymium, dysprosium, terbium

Aviation sector: titanium

Photovoltaic solar technologies: cadmium, indium, gallium

Categorise of Critical Minerals:

Critical minerals have been **classified into three categories** based on their end-use industries:

Traditional — titanium, vanadium

Sunrise — lithium

Mixed use — cobalt, nickel, graphite, light rare earth elements (LREEs), heavy rare earth elements (HREEs)

However, there are **eight minerals considered to be of greatest interest** and these include **lithium, cobalt, nickel, graphite, LREEs, HREEs, titanium and vanadium**.

Minerals Security Partnership (MSP):

MSP **focuses on critical minerals** that are **inputs for electric vehicles and advanced batteries**.

Australia, Canada, Finland, France, Germany, Japan, Korea, Sweden, the United Kingdom, the United States, and the European Union have joined the MSP.

The Centre for Social and Economic Progress (CSEP):

CSEP is **based in New Delhi** and registered as a company limited by shares and not for profit, under Section 8 of the Companies Act, 1956.

The mission of CSEP is to **conduct research and analysis on urgent and critical policy issues** and offer solutions that are both relevant and practical.

Challenges in ensuring critical minerals supply:

Limited availability of critical minerals: The rare availability of critical minerals poses a challenge in meeting the growing demand for these minerals.

Geopolitical risks: Complex supply chains can be disrupted by hostile regimes or politically unstable regions, leading to supply chain disruptions due to war, disaster, etc.

Dominance of certain countries: A few countries, such as China, are the dominant producers of critical minerals, leading to concerns over supply disruptions in case of a geopolitical conflict.

Increasing demand for critical minerals: With the shift towards renewable energy technologies and electric vehicles, the demand for critical minerals such as copper, lithium, and rare earth elements is increasing rapidly.

Reliance on foreign partners: Countries with limited reserves and higher requirements for critical minerals may have to rely on foreign partners to meet their domestic needs, leading to supply chain vulnerabilities.

Environmental and social concerns: The extraction and processing of critical minerals can have negative environmental and social impacts, leading to challenges in meeting sustainability goals.

Way forward:

India **needs to explore** the unexplored critical minerals. **At present critical minerals can be processed only by the public sectors**.

The **Mines and Minerals (Development and Regulation) (MMDR) Act 1957** need to be amend to **exclude the critical minerals as atomic mineral**s.

The **assessment of critical minerals** for India needs to be **updated every three years** to keep pace with changing domestic and global scenarios.

Critical minerals must be **prospected, explored, and mined on priority** as any delays may hinder India's emissions reduction and climate change mitigation timeline.

Reconnaissance and exploration of minerals must be encouraged, with particular attention given to deep-seated minerals.