



Rare Earth Metals

For Prelims: Confederation of Indian Industry, India Rare Earths Mission, Deep Ocean Mission

For Mains: Rare Earth Metals and the need to develop capabilities to increase its production in India

Why in News?

Amid India's reliance on China for rare earth minerals imports, the [Confederation of Indian Industry \(CII\)](#) has urged the government to encourage private mining in the sector and diversify supply sources.

- Though India has **6% of the world's rare earth reserves**, it only produces 1% of global output, and meets most of its requirements of such minerals from China.
- In 2018-19, **for instance, 92% of rare earth metal imports by value and 97% by quantity were sourced from China.**

What are the Suggestions of CII?

- CII suggested that an '**India Rare Earths Mission**' be set up manned by professionals, similar to the [India Semiconductor Mission](#), as a critical component of the [Deep Ocean Mission](#).
- The industry group has also mooted **making rare earth minerals a part of the 'Make In India' campaign**, citing China's 'Made in China 2025' initiative that focuses on new materials, including permanent magnets that are made using rare earth minerals.

What are Rare Earth Metals?

- They are a **set of seventeen metallic elements**. These include the fifteen lanthanides on the [periodic table](#) in addition to scandium and yttrium that show similar physical and chemical properties to the lanthanides.
 - The 17 Rare Earths are cerium (Ce), dysprosium (Dy), erbium (Er), europium (Eu), gadolinium (Gd), holmium (Ho), lanthanum (La), lutetium (Lu), neodymium (Nd), praseodymium (Pr), promethium (Pm), samarium (Sm), scandium (Sc), terbium (Tb), thulium (Tm), ytterbium (Yb), and yttrium (Y).
- These minerals have **unique magnetic, luminescent, and electrochemical properties** and thus are used in many modern technologies, including consumer electronics, computers and networks, communications, health care, national defense, clean energy technologies etc.
- Even futuristic technologies need these REEs.
 - For example, high-temperature superconductivity, safe storage and transport of hydrogen for a post-hydrocarbon economy etc.
- They are called '**rare earth**' because **earlier it was difficult to extract them from their oxides forms technologically.**
- They occur in **many minerals** but typically in low concentrations to be refined in an economical manner.

How China Monopolised Rare Earths?

- China has over time acquired global domination of rare earths, even at one point, it produced 90% of the rare earths the world needs.
- Today, however, it has come down to 60% and the remaining is produced by other countries, including the **Quad (Australia, India, Japan and United States)**.
- Since 2010, when China curbed shipments of Rare Earths to Japan, the US, and Europe, production units have come up in Australia, and the US along with smaller units in Asia, Africa, and Latin America.
- Even so, the dominant share of processed Rare Earths lies with China.

What is India's Current Policy on Rare Earths?

- Exploration in India has been **conducted by the Bureau of Mines and the Department of Atomic Energy**. Mining and processing has been performed by **some minor private players in the past, but is today concentrated in the hands of IREL (India) Limited (formerly Indian Rare Earths Limited)**, a Public Sector Undertaking under the Department of Atomic Energy.
- India has **granted government corporations such as IREL a monopoly** over the primary mineral that contains REEs: monazite beach sand, found in many coastal states.
- IREL produces rare earth oxides (low-cost, low-reward “upstream processes”), selling these to foreign firms that extract the metals and manufacture end products (high-cost, high-reward “downstream processes”) elsewhere.
- IREL’s focus is to provide thorium — extracted from monazite — to the Department of Atomic Energy.

What are the Related Steps taken?

- **Globally:**
 - The **Multilateral Minerals Security Partnership (MSP)** was announced in June 2022, with the goal of bringing together countries to build robust critical minerals supply chains needed for climate objectives.
 - Involved in this partnership are the United States (US), Canada, Australia, Republic of Korea, Japan, and various European countries.
 - India is not included in the partnership.
- **By India:**
 - Ministry of Mines has amended Mines and Minerals (Development and Regulation) (MMDR) Act, 1957 through the **Mines and Minerals (Development and Regulation) Amendment Act, 2021** for giving boost to mineral production, improving ease of doing business in the country and increasing contribution of mineral production to Gross Domestic Product (GDP).
 - The amendment act provides that no mine will be reserved for particular end-use.

Way Forward

- **India must take lessons from other advanced economies on how they are planning to secure their mineral needs** and attempt to join multinational fora on assuring critical mineral supply chains - or use existing partnerships, such as Quad and **BIMSTEC**, to foster such dialogues.
 - There must also be **top-level decision making within the government to strategize on how to create vertically integrated supply chains** of green technologies manufacturing, or we may be in serious danger of missing out on our climate change mitigation targets.
- India needs to **create a new Department for Rare Earths (DRE)**, which would play the role of a regulator and enabler for businesses in this space.

Q. Recently, there has been a concern over the short supply of a group of elements called 'rare earth metals'. Why? (2012)

1. China, which is the largest producer of these elements, has imposed some restrictions on their export.
2. Other than China, Australia, Canada and Chile, these elements are not found in any country.
3. Rare earth metals are essential for the manufacture of various kinds of electronic items and there is a growing demand for these elements.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Ans: (c)

Source: TH

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