It's Elementary

Amid global jitters over China's export curbs on rare earths, India has identified new hotspots for mining. But diplomacy, not discoveries, is key in the near term

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Papum and Pare —two little-known rivers winding through the hills of Arunachal Pradesh—may soon step into the national spotlight.

The Papum Pare district, named after these rivers, has emerged as a promising frontier in India's quest for rare earth elements (REEs). A Ministry of Mines handbook released in June spotlighted the region's "notably high neodymium" content —a vital component in electric vehicles and advanced electronics.

If tapped, these reserves could one day fuel EV and auto manufacturing hubs from Gurgaon to Pune to Chennai.

And Papum Pare is just the beginning.

REE-enriched soils have also been identified in Assam's Karbi Anglong, while a bauxite-REE belt has surfaced in Meghalaya's Sung Valley. Adding to the momentum, Coal and Mines Minister G Kishan Reddy informed Parliament last month of newly discovered REE deposits of "promising" nature in the Singrauli coalfields of Madhya Pradesh.

Together, these discoveries signal a broader shift: the strategic metals the world is scrambling to secure are not limited to India's well-known beach sands, red sands, or alluvial deposits in states like Andhra Pradesh, Odisha, Tamil Nadu, Kerala, West Bengal, Gujarat, and Maharashtra.

They lie deeper inland too —across the forests, hills, and even coalfields of India's unexplored heartlands.

Amid global jitters over China's export curbs on rare earth, India has identified many of these new hotspots. Yet, diplomacy, not discoveries, holds the key to near-term supply security.

A MATTER OF BALANCE

"India simply can't keep all its eggs in one basket. China will extract its pound of flesh, then open the gates—but by then, the damage may be done," says a top executive of an Indian auto company requesting anonymity as he is also aiding the government to explore alternative sources for metals.

India's reliance on China for rare earth magnets remains strikingly high, with 85-90% of import volumes and 60-80% of import value in two key categories. This data, revealed in a written reply to the Rajya Sabha on August 1, underscores the depth and complexity of India's supply chain dependence.

According to an SBI Research report released last month, China's export curbs are impacting a broad swathe of industries including transport equipment, basic metals, machinery, construction and electrical and electronics, highlighting the far-reaching consequences of supply chain disruptions.

While discovery of new pockets of clean-tech metals offers hope, India Inc urgently needs a diversified and resilient supply chain

THE RARE IN RARE EARTH

REEs comprise a group of 17 elements, divided into two categories: light and heavy. Light REEs, such as neodymium and praseodymium, are essential for electric vehicle motors, wind turbines among others.

In contrast, heavy REEs like dysprosium and terbium are critical for high-performance applications, including fighter jets and other advanced defence systems that require enhanced magnetic stability.

While rare earths are classified as critical minerals, it's important to note that not all critical minerals are rare earths. Elements such as lithium and cobalt, also vital to the EV ecosystem, fall into the critical category but are not part of the rare earth family.

In 2024-25 alone, the Geological Survey of India undertook 195 exploration projects to assess critical minerals including REEs.

While the discovery of new pockets of clean-tech metals offers hope for the future, what India Inc urgently needs is a diversified and resilient supply chain. The reason is simple: China is dominating the game.

India may rank third globally in rare earth reserves—trailing only China and Brazil—but when it comes to actual production and refining, the numbers tell a stark story.

As of 2024, China mines nearly 70% of the world's rare earth and controls an overwhelming 90% of refining capacity, according to US Geological Survey's data.

India's production share is less than 1%. So, when Beijing imposed export restrictions in April —largely aimed at the US as part of tariff retaliation—the ripple effects were global.

AUTO BREAKDOWN

For Indian automakers heavily reliant on Chinese rare earth magnets, alarm bells rang.

"This problem took automakers by surprise, but the disruption affects China too. So, it won't last long," says RC Bhargava, the chairman of the country's largest carmaker Maruti Suzuki.

Thanks to ample stockpiles and less exposure to the EV portfolio, the company has so far escaped unscathed. Bhargava remains confident that the industry will navigate around geopolitics, as it always has.

Mahindra also saw the storm coming. "We are comfortably covered on the rare earth magnet issue," says Rajesh Jejurikar, Executive Director & CEO of Mahindra's auto and farm sectors. "With a combination of inventory planning and alternative sourcing, we're covered for the next two quarters and mostly even for Q4," he adds.

But not every player is as insulated.

Ather Energy has already flagged potential volume shortfalls this quarter, and Bajaj Auto has taken the drastic step of temporarily halting production.

Over at TVS Motor, which is gearing up to launch electric motorcycles and bicycles later this year, the scramble is on to secure materials from non-Chinese sources. "Supply chain constraints could affect our new launch timelines," admitted CEO KN Radhakrishnan during the company's April-June earnings call.

Global Rare Earth Reserves, 2024

- 49% China
- 23% Brazil
- 8% India
- 6% Australia
- 4% Russia
- 10% Others

(Note: India's share is less than 1% in rare earth production) Source: US Geological Survey, as quoted in CareEdge Report, July 2025

WORKAROUNDS

As noted in a June statement by rating agency ICRA, Indian auto component makers have been actively exploring contingency measures.

These include importing fully assembled motors from China, shipping rotors to China for magnet assembly and re-importing them, and even substituting rare earth magnets with alternative engineered materials.

However, ICRA cautioned that these workarounds are fraught with logistical, regulatory, and engineering complexities, making them far from seamless solutions.

China's export ban targets raw magnets, not finished motors. This subtle but significant distinction means the final product can still be imported. It, though, undercuts the economic and strategic benefits of local manufacturing.

Ashutosh Sharma, former secretary of the department of science and technology, believes India must adopt a multi-pronged strategy to navigate the rare earth crisis.

At the core of his argument is the need to boost domestic production, especially given India's considerable reserves—8.52 million tonnes (MT) of rare earths, including 7.23 MT of Rare Earth Oxide contained in monazite. "The government should incentivise domestic production," Sharma asserts, pointing to untapped potential beneath India's soil.

At the same time, he underscores the importance of securing international supply lines through trade diplomacy. Finalising free trade agreements with resource-rich nations like Chile and Peru, he suggests, could help unlock critical mineral access. He also notes India's ongoing efforts to diversify imports by deepening engagement with countries such as Australia and Argentina.

India's trying to diversify imports by deepening engagement with Oz and Argentina. FTAs with other resource-rich nations could also help unlock access

Beijing has been aggressively securing and processing rare earths worldwide, employing a mix of diplomacy, strategy, and opportunism—even in conflict-ridden regions.

In 2024, Myanmar emerged as the world's third-largest producer of REEs, trailing only China and the US, a surge largely driven at China's behest, with much of the supply coming from the Kachin region, now controlled by rebel groups.

This raises a pressing question: Can New Delhi flex its diplomatic muscle to forge alternative, stable rare earth supply chains of its own?

RARE SEARCH

Khanij Bidesh India Ltd (KABIL), a government-owned entity established in 2019, is actively scouting for overseas critical mineral assets, particularly lithium and cobalt.

The company is currently pursuing projects in Argentina, Australia, and Chile.

Meanwhile, several industry observers note that the government is actively considering a reduction in customs duties on imported electric motors to ease cost pressures on manufacturers.

Simultaneously, it is urging domestic players like IREL (India) to ramp up mining operations and develop a comprehensive rare earth value chain within the country. But such an ecosystem could take years to materialise.

This raises an obvious question: Why was IREL—a state-run enterprise under the department of atomic energy—exporting rare earth for years instead of supplying domestically?

"There simply weren't any takers from the auto sector," says an industry insider. "Chinese imports were cheaper and commercially more viable. But yes, the tables have turned now."

Reflecting this shift, IREL has recently suspended its REE exports to Japan, aiming to conserve strategic resources for domestic consumption as India moves to insulate itself from global supply shocks.

Global Rare Earth Mining, 2024

- 69% China
- 12% US
- 8% Myanmar
- 3% Australia
- 8% Others

Meanwhile, companies like Vedanta and Hindustan Zinc are positioning themselves to play a central role. In May, Hindustan Zinc secured a rare earth block in Uttar Pradesh's Sonbhadra district, marking a significant step toward diversifying the country's strategic mineral base.

Vedanta, too, is aggressively pursuing critical mineral assets across Maharashtra, Rajasthan, Bihar, Arunachal Pradesh, Karnataka, and Chhattisgarh.

"We're leveraging our expertise in advanced metal extraction," says Arun Misra, Executive Director at Vedanta, "and investing in rare earth exploration and refining".

However, Misra offers a word of caution. "Policy reform is crucial," he notes. "The current auction regime treats critical minerals like bulk commodities—and that simply won't work. We need a specialised framework to fast-track their exploration and development."

TIME TO SCIENCE IT

According to former secretary Sharma, India's rare earth strategy must strike a careful balance between diplomacy and science—diplomacy to secure resilient global supply chains, and science to develop new technology for indigenous production, and also to pioneer alternatives to traditional REEs. "Ultimately, we need to develop a new class of materials with properties similar to rare earths," he says. "India must take the lead on this."

There are early signs of indigenisation. One such initiative is a ₹250-crore project backed by the Technology Development Board, a statutory body under the department of science and technology—which last year partnered with Pune-based Midwest Advanced Materials to support the indigenous commercial production of neodymium materials and rare earth permanent magnets.

In the near term, diplomacy may buy time. But in the long run, it is science and innovation that will put India in control of its destiny.

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