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India's mining journey: Unlocking potential, embracing diversity, and pioneering sustainability

Iron ore, a lynchpin of India's industrial growth, has seen production leap from 152 million tonnes in FY14 to 274 million tonnes in FY24, making India the world's fourth-largest producer. This growth supports critical industries such as steel, infrastructure, automotive and has allowed the country to export 40-45 million tonnes of surplus iron ore.



Arun Misra, • ETManufacturing

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India's mining journey is not only about volumes and value; it's also about people.

India's robust growth and development has been a systematic journey of upgradation over the years which has made our country stand out on the global map. This development is part of a bigger idea - Atmanirbhar Bharat that is driving India forward. Under the bigger idea of Atmanirbhar Bharat, India is on an inspiring mission to become the world's leading and most sustainable producer of critical minerals. Over the past decade, the nation has transformed its mineral production landscape, evolving from a consistent producer to a formidable global competitor. This remarkable shift is the result of the government's collaborative efforts and sweeping reforms, unlocking the immense potential of the mineral sector. Major mineral production has soared from Rs 50,000 crore in FY14 to an impressive Rs 1.40 lakh crore in FY24, driven by iron ore, limestone, bauxite, and manganese ore. The industry is also critical from an employment perspective as minerals & metals is one of the largest employing industrial sectors in India which accounts for a mix of blue and white collared jobs.

Iron ore, a lynchpin of India's industrial growth, has seen production leap from 152 million tonnes in FY14 to 274 million tonnes in FY24, making India the world's fourth-largest producer. This growth supports critical industries such as steel, infrastructure, automotive and has allowed the country to export 40–45 million tonnes of surplus iron ore. Similarly, limestone production, vital for the cement industry, grew from 281 million tonnes in FY14 to 450 million tonnes in FY24. Together, these sectors form the bedrock of India's robust development trajectory. Not just infrastructure, but these minerals make today's innovation possible. From data centres to telecom technology to information technology, in a myriad ways minerals have played a key role in creating a more connected India.

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India's position as a global player in non-ferrous metals like aluminium, zinc, lead and copper is equally commendable which is driving the vision ahead for the global energy transition. In case of minerals such as bauxite and manganese ore, India ranks fifth and sixth globally. Bauxite, the ore of aluminium, has seen strong growth from 14.6 million tonnes in FY14 to 21.0 million tonnes in FY24, reflecting the growth of the aluminium industry. Manganese, an important input for steel, has grown from 2.6 million tonnes in FY14 to 3.4 million tonnes in FY24. The importance of this mineral production growth lies in its ability to meet the needs of major downstream industries. This strategic advantage has propelled India to global leadership in sectors like steel, cement, and non-ferrous metals. The mineral value chain has become a cornerstone for large-scale investments in infrastructure, energy, transport, and construction, fostering economic growth and self-reliance.

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The transformation of India's mineral sector is rooted in strategic reforms. The 2015 amendment to the Mines and Minerals (Development and Regulation) Act established mechanisms like the National Mineral Exploration Trust (NMET) to enhance exploration. Key changes, such as the introduction of a transparent auction regime, a uniform 50-year

lease period, and state-empowered auctions, have brought greater accountability and operational stability.

The 2023 amendments gave the central government the authority to auction blocks of 24 critical and strategic minerals, paving the way for domestic capacity building in these crucial areas. The introduction of Exploration Licenses for critical/deep-seated minerals further strengthens exploration capabilities. The 2023 amendment to the OAMDR (Offshore Areas Mineral Development and Regulation) Act brought an auction mechanism for offshore mineral rights, opening new avenues for mineral exploration and production. The 2023 reforms have brought in a new era of mineral production. The focus on critical minerals, with the successful auction of 24 such minerals and the announcement of a Critical Minerals Mission, is a big step toward strengthening supply chain resilience. Offshore mining by the government after thorough exploration is another landmark event. India's mineral sector has already made its mark in the world. With new opportunities such as offshore mining and critical minerals, India can further consolidate its position as a global mineral powerhouse.

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India's mining journey is not only about volumes and value; it's also about people. The government has introduced significant initiatives to enhance diversity and inclusion in mining, a sector historically dominated by men. Policies encouraging women in mining operations, such as amending labour laws to allow women to work in underground mines, reflect a progressive mindset. Industry leaders like Vedanta and Hindustan Zinc have taken this vision forward by establishing India's first all-women underground mine rescue team and promoting gender inclusivity across operations. These efforts empower women to take on roles across the value chain, creating a more diverse and dynamic workforce.

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Sustainability lies at the core of India's mining ambitions. Initiatives like the Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) focus on community development, ensuring mining benefits local populations through infrastructure, education, and healthcare. Environmental protection remains a priority, with advancements in green technologies, renewable energy adoption, and commitments to net-zero targets shaping India's sustainable mining practices. The fact that India's Hindustan Zinc and Vedanta Ltd rank No.1 and 5 on S&P's 2024 list of

the world's most sustainable metal and mining companies out of 238 global companies reflects how sustainable Indian mining companies truly are.

To further enhance the contribution of the mining industry to India's GDP as well as speed up the journey towards the next generation 'Energy Economy', more mineral blocks need to be auctioned. Alongside increasing number of blocks, the block sizes must be increased to ensure true mineral conservation, thus provisioning for adequate material holding areas on the surface and infrastructure for mineral beneficiation. While exploration has been encouraged in the current mining policy, special provisions may be made for research related work on mineral beneficiation and extraction, specifically for new minerals like selenium, germanium etc. Suitable incentives may be designed for mining companies to work with national laboratories and academic institutions in this regard.

With critical minerals driving future technologies and infrastructure needs, India is well-positioned to become a global mining powerhouse. Moreover, the sector's potential to generate 25 million additional jobs by 2047 aligns with the nation's demographic and economic aspirations.

As we stride toward 2047, India's mining story has a huge potential to be a global benchmark, combining technological innovation, sustainable practices, and a focus on inclusivity to achieve its vision of a \$30 trillion economy. By leveraging its natural wealth responsibly and embracing diversity, India sets an example for the world—a future built on resilience, innovation, and shared prosperity.

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