खान मंत्रालय
MINISTRY OF
MINES
सत्यमेव जयते

FIMI

Report on States' Best Practices in Mining

January 2025

Federation of Indian Mineral Industries

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EY Parthenon
Shape the future with confidence

Make India self-reliant in meeting its mineral requirements and foster a mining ecosystem that leverages cutting - edge technology, innovative policy measures and sustainable practices to deliver tangible benefits to the nation's economic and social welfare of the nation.

Messages

जी. किशन रेड्डी
జి. కిషన్ రెడ్డి
G. Kishan Reddy

सत्यमेव जयते

कोयला एवं खान मंत्री
भारत सरकार
नई दिल्ली
MINISTER OF COAL AND MINES
GOVERNMENT OF INDIA
NEW DELHI

Message

India's mining sector will serve as a cornerstone in the nation's journey towards achieving the vision of **Viksit Bharat 2047**. With its abundant mineral resources, our country holds tremendous potential to become a global leader in sustainable and innovative mining practices. In pursuit of Hon'ble Prime Minister Shri Narendra Modi's vision of an **"Aatmanirbhar Bharat",** the Mining sector has undergone an unprecedented reform journey in the past 10 years. As we move forward, we can strengthen this resolve through a collaborative and knowledge-sharing approach, fostering mutual learning and growth.

This Study Report on **"States' best practices in mining"** represents a thorough initiative by the Ministry of Mines to document and highlight exemplary initiatives adopted by various states in the mining sector. It covers a wide range of practices from the adoption of advanced technologies in mineral exploration to effective environmental management and from promoting community welfare to ensuring transparency and accountability in mining operations. This report showcases pioneering practices undertaken by various states that may set new benchmarks for the other states to follow.

I am confident that this report will contribute significantly to our collective understanding of the initiatives undertaken by Mining Departments of various states. Their commitment to responsible mining practices has laid the foundation for replicable models that can drive India's mining sector towards excellence.

As we move forward, I encourage State Governments, industry leaders and all stakeholders to utilize this report as a valuable guiding resource. By learning from these best practices and fostering a spirit of cooperation, we can collectively ensure that India's mining sector continues to thrive while addressing environmental and social imperatives.

Together, let us strive towards a mining future that is not only prosperous but also sustainable and inclusive.

(G. Kishan Reddy)

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Satish Chandra Dubey

सत्यमेव जयते

आज़ादी का अमृत महोत्सव

राज्य मंत्री
कोयला एवं खान
भारत सरकार
MINISTER OF STATE FOR
COAL & MINES
GOVERNMENT OF INDIA

संदेश

भारत का खनन क्षेत्र पिछले कुछ वर्षों में तीव्र विकास का साक्षी बना है, जिसने देश में खनिजों की बढ़ती मांग को पूरा करने और वैश्विक ऊर्जा समाधानों में महत्वपूर्ण योगदान देने में मुख्य भूमिका निभाई है। यह क्षेत्र अक्षय ऊर्जा प्रौद्योगिकियों, इलेक्ट्रिक वाहनों और बुनियादी अवसंरचना के लिए आवश्यक कच्चा माल प्रदान करते हुए ऊर्जा परिवर्तन के लिए मुख्य आधार के रूप में कार्य करता है, जो भारत की राष्ट्रीय और अंतरराष्ट्रीय प्रतिबद्धताओं के अनुरूप है।

"***खनन में राज्यों के सर्वोत्तम कार्य***" विषय के इस अग्रणी दस्तावेज का प्रकाशन विभिन्न राज्यों द्वारा की गई अनुकरणीय पहलों पर प्रकाश डालता है, जो प्रशासनिक दक्षता में सुधार, खनन कार्यों को पर्यावरणीय स्थिरता और सामाजिक जिम्मेदारी के अनुरूप रखने के लिए उनके समर्पण को दर्शाता है।

मैं, माननीय कोयला और खान मंत्री को उनके दूरदर्शी नेतृत्व और भारत के खनन परिदृश्य में परिवर्तनकारी बदलाव लाने के लिए उनकी अटूट प्रतिबद्धता के लिए हार्दिक धन्यवाद देता हूँ। उनके अथक प्रयासों और दूरदर्शी दृष्टिकोण ने इस पहल को प्रेरित किया है और देश में सतत और उत्तरदायी खनन पारिस्थितिकी तंत्र की प्रगामी प्रगति सुनिश्चित की है।

देश भर के राज्य खनन एवं भूविज्ञान विभागों (डीएमजी) का योगदान विशेष रूप से उल्लेखनीय है। उनकी सक्रिय भागीदारी और बहुमूल्य अंतर्दृष्टि ने इस अध्ययन को और समृद्ध बनाया है, जिससे यह व्यावहारिक समाधानों और अनुकरणीय पहलों का भंडार बन गया है। मुझे पूरी उम्मीद है कि यह दस्तावेज़ राज्यों के लिए सर्वोत्तम प्रथाओं को अपनाने और इसकी पुनरावृत्ति के लिए एक मार्गदर्शक के रूप में कार्य करेगा, जिससे देश भर में खनन कार्यों में उत्कृष्टता और स्थिरता की संस्कृति को बढ़ावा मिलेगा।

आज जब हम ज्ञान साझा करने और निरंतर सुधार की यह यात्रा आरंभ कर रहे हैं, मुझे विश्वास है कि यह प्रकाशन भारत के खनन क्षेत्र के उज्ज्वल और अधिक स्थायी भविष्य का मार्ग प्रशस्त करेगा।

(श्री सतीश चंद्र दुबे)

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Message

This document, "States' best practices in mining,"- is a first of its kind study and a testament to the collaborative spirit and dedicated efforts of State Governments, which have worked tirelessly to initiate and implement innovative practices, streamline processes and promote sustainability in mining operations. Their close coordination with the Ministry of Mines and other stakeholders has been instrumental in creating replicable models that benefit the nation as a whole.

India's mining sector stands at a critical juncture where adopting transformative technologies such as artificial intelligence, automation and digital mapping can redefine its efficiency and sustainability. The report underscores the need for the sector to evolve, embracing innovations that reduce environmental impacts, enhance transparency and ensure equitable resource distribution. It provides valuable insights and actionable recommendations for Central and State governments that can inspire to drive meaningful change.

I place on record my appreciation for the good work done by Economic Wing of the Ministry, which has been instrumental in bringing this report to fruition in a record time. I also place on record the untiring efforts of team members of Federation of Indian Mineral Industries, whose valuable contributions have been integral to the success of this study. Their industry perspective and collaborative spirit have enriched the outcomes of this endeavor. I am sure that this publication would serve as a valuable resource for policymakers, industry leaders and all those invested in the future of Indian mining.

As we look ahead, I urge all stakeholders to draw inspiration from the best practices highlighted in this report. By fostering a culture of innovation and collaboration, we can transform India's mining sector into a global leader that balances growth with sustainability and inclusivity.

(V.L. Kantha Rao)

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Prologue

Prologue

R K Sharma
Special Advisor

FEDERATION OF INDIAN MINERAL INDUSTRIES

"States' best practices in mining' is a first of its kind study undertaken by Federation of Indian Mineral Industries (FIMI) under the aegis of Ministry of Mines, Government of India. The study report offers key insights discovering the unique best practices adopted and implemented by various states for the development of the mineral and mining sector. This initiative enables different stakeholders to learn from these best practices and complements the SMRI (State Mining Readiness Index) initiative, driving outcome-based actions across the focus areas

The study report is an exclusive document wherein all the best practices adopted by the State DMGs for the major and minor minerals have been brought together to create cognizance among other states for augmenting mineral development in the country. For the purpose of collecting information, interactive workshops were organized by FIMI in association with Ministry of Mines, dedicated questionnaires were prepared, and multiple online meetings, brainstorming sessions with stakeholders and regulators were held for identifying the relevant information for the study. This study provides focus recommendations in specific areas from exploration to mine closure and reclamation.

It is a matter of pride that this study has been successfully conducted under the able guidance of Shri Shakil Alam, Economic Adviser, Ministry of Mines with active support from various states DMGs. Ernst & Young being the knowledge partner, brought their immense mining expertise, cutting edge global best practices, deep understanding of states & Indian mining businesses and played a crucial role in undertaking the study and preparation of the report. Our mining industry members also contributed significantly in carrying out the study

(R.K SHARMA)

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At Ernst & Young, we are extremely proud to be part of this initiative, shaping the future of the Indian mining industry and building a better working world

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01

Background and Vision

Background and Vision

Background

The mining sector in India plays a crucial role in the economy, significantly contributing to industrial growth and infrastructure development. India boasts abundant mineral resources, such as coal, iron ore, bauxite, limestone and various industrial minerals. These resources are essential for the country's industrial activities and energy requirements. The mining sector is a significant contributor to India's GDP, holding a significant share in mineral and metal production, and it supports other industries like construction, manufacturing, and energy. The role of the State governments is crucial for effectively implementing policies to ensure the sustainable development of the mineral sector at a faster pace. This requires innovative approaches and a robust, multi-speed information technology and infrastructure system that facilitates rapid growth of the sector

It is with this objective in mind that the Ministry of Mines has embarked upon an initiative to study and identify best practices undertaken by states in mining. The Ministry of Mines has engaged with Federation of Indian Mineral Industries (FIMI) to study and identify best practices undertaken by states in mining administration that will complement the ministry's ongoing work of developing the State Mining Readiness Index.

The study aims to identify, analyse, and evaluate diverse best practices implemented by State Governments to foster sustainable growth in the mining sector. A dedicated study team, comprising senior officials from the Ministry of Mines and FIMI, was constituted for this purpose. The study team conducted multiple rounds of interactions, meetings, Workshops and follow-ups with the State DMGs to understand and assess the best practices adopted by State Governments.

Vision

The long-term objectives attempt to explore the potential of Indian mining industry playing a larger role in the global market by bringing in adequate investment in exploration and mining and thereby becoming globally competitive in cost and quality with world class technology infusion and establishing unmatched operating practices. The mining sector can make significant measurable contributions to GDP, employment generation, reducing costs of production for domestic downstream industries, bringing FDI in the country and preparing our nation for the future by identifying and mining strategic rare earth and deep-seated minerals.

It is widely believed that the world's mineral production and consumption scenario will be remarkably different in the next 30 years. Massive technological changes are likely to bring in more disruptions in the business of mining. The concept of digital mines enabled by big data analytics, machine learning and artificial intelligence has already started gaining pace. The focus on climate change, environmental sustainability and upliftment of local communities has also increased. This is an opportunity for the mining and metals community to define the role it can play to shape the agenda and to embrace the changes to come. There is a need to embrace these transformations and define the strategic priorities for success.

Minerals are vital to any modern economy. However, the extraction of minerals impacts the environment, economy and people. To ensure that the needs of tomorrow are met, the negative impacts need to be minimised and the benefits or positives to be maximised. It is also important to prioritise specific exploration and mining efforts to develop minerals which may not be commercially viable but carry domestic strategic interests in the world of new technological development and areas such as Defense.

The long-term road map will require collaboration from Government and industry. The Government will be responsible for giving strategic support on key technologies and policy formation. The industry will be responsible for optimum and sustainable exploration and extraction.

"Make India self-reliant with respect to mineral requirements and develop a mining ecosystem which drives application of latest technology, innovative policy interventions and sustainable mining practices to create tangible impact to the economic and social welfare of the nation."

02

Executive Summary

Executive summary

India's geographic landscape is rich in minerals such as coal, iron ore, bauxite, chromite and limestone, among others. It is largely self-reliant except for coking coal, gold, diamonds and copper. Despite this vast mineral endowment, the mining sector's contribution to the national GDP is a meager 2%, which is insignificant compared to other mining-dependent economies like Australia, where mining contributes ~12% to its GDP. With robust growth across the industrial sector and production, the mining sector presents a significant opportunity, with reserves accounting for ~20% of global resources. This potential is further bolstered by the Atmanirbhar Bharat and Viksit Bharat agendas. To fully realize this opportunity, it is imperative for India's mining industry to adopt best practices from leading states within the country as well as international benchmarks set by countries like Australia, Canada, South Africa and South America.

The effort to align with global best practices began with an interactive workshop organized by FIMI in association with the Ministry of Mines. Various stakeholders, including representatives from state and central governments and industry regulators, participated in launching this initiative. Information on best practices adopted by different states and the resulting outcomes was shared by the state DMGs. The key focus themes and initiatives were refined through multiple physical and virtual meetings to prepare a summarized view of the current state and outcomes. The report, along with state-specific recommendations, was presented to the Ministry of Mines and state DMGs to gather additional inputs and suggestions across focus areas. The final report stands as a testament to the effective collaboration of various stakeholders in supporting this critical initiative.

Globally, mining-heavy countries have implemented several best practices across different themes. Australia emphasizes mineral administration and infrastructure to ensure speed and efficiency in mining exploration and operations. South Africa and Canada focus on biodiversity and sustainability to drive holistic development, while South America leverages technology to accelerate economic growth through digitalized permits, approvals and governance. Drawing insights from these international examples and the best practices within Indian states, the report outlines eight key focus themes for consideration.

Mineral Administration and mineral concession
Includes facilitation of permits and approvals through streamlined processes

Technology, research and development
Leveraging advanced technologies and digital initiatives to improve operational efficiency

Sustainable mining practices
Includes initiatives that promote sustainable measures and carbon reduction through afforestation

Skilling and capacity building
Initiatives that promote development through safety standards and trainings for mining operations

Exploration and mines development
Focus on identifying new resources enabled by digitalization and strategic collaboration with global agencies

Social project implementation
Adopting initiatives that develop communities and mines restoration and rehabilitation

Mine closure and waste management
Promoting effective management practices for abandoned mines and proper waste management

Forward integration to processing industries
Enabling consumption of mining output through forward integration with industries

While this report aims to help various stakeholders improve awareness of best practices, its implementation will require seamless collaboration between the central government, state governments and the industry. The report outlines five thematic pillars of recommendations to drive not only the adoption of initiatives, but also the achievement of their expected outcomes.

Administration
Faster clearances through time bound approvals, pre-embedded approvals, focus on strategic and minor minerals, empowerment of juniors and sustainability enablement, etc.

Economics
Rationalization of taxes and royalties, rationalized budgetary allocations, concessions based on nature of mines and forward integration, standardized pricing for land acquisition, etc.

R&D, technology and Infrastructure
Leveraging digital platforms for administration and governance, R&D for green practices, overseas acquisitions and collaborations and dedicated freight corridors, etc.

Governance
Single-window clearances, standardized reporting framework, enhanced safety and sustainability standards, empowerment of local bodies, outcome focused governance, etc.

Capability development
Strengthening foundation education through degree programs, new vocational training programs, leveraging skill council for training and skill development, strengthening of state DMGs, etc.

03

Methodology for the study

3.1 Framework for the study

Currently, the mining sector's contribution in India's GDP is only about 2.1%. However, it has much more potential to contribute to the country's GDP. The role of the State governments is vital for effective implementation of policies to enhance the mineral production and sustainable development of the mineral sector at a faster pace. This requires:

- Innovative approaches
- Conducive mineral development and administration
- Robust, multi-speed information technology and infrastructure system that facilitates rapid growth of the sector.

Hence, there is a need to conduct the study to identify, analyze and evaluate the diverse best practices adopted by state governments

Approach and methodology for the study

Interactive workshops with stakeholders	Review of info received from state govt and global benchmarking	Online interactions with stakeholders	Meeting with regulators	VC Meeting (Post preparation of draft report)
▪ Workshop organized by FIMI in association with the Ministry of Mines ▪ Presentation by respective states about best practices adopted by them ▪ Discuss the agenda or objective of study ▪ Briefing on the expected data, information or inputs required from the state governments ▪ Stakeholders: State DMGs, industry associations, regulatory authorities	▪ Review of data and information received from State Governments or case studies related to best practices ▪ Analyze documents to derive insights for best practices ▪ Summarize essential findings	▪ Administer surveys, interactions and questionnaire to DMGs, industry and other stakeholders ▪ Analyze the collected responses to obtain qualitative data on mining practices ▪ Conduct structured or semi-structured virtual interviews ▪ Transcribe and analyze interview data for insights	▪ Meeting with key regulators for review and validation of preliminary findings ▪ Feedback from the regulators for analysis and recommendations	▪ Post preparation of draft report, VC meeting, chaired by Secretary, Ministry of Mines, was conducted with all States ▪ Discussions were done on the presentation of the draft report in the VC meeting ▪ Post the VC meeting, states have provided additional information on few best practices which are incorporated in the final report

This study about the best practices adopted by states in mining will complement the Ministry's ongoing work of implementing the State Mining Readiness Index (which is a Quantitative assessment to assess and rank the states based on their preparedness and capacity to manage and regulate the mining sector effectively)

Workshops and stakeholders' meetings: Collaborative efforts for the study

Snapshots of physical meeting held on 23 October 2024

- The Ministry of Mines, in collaboration with the Federation of Indian Mineral Industries (FIMI) organized a one-day workshop on Study on State Best Practices in Mining on 23 October 2024 at FIMI House, New Delhi.
- The aim of this interactive workshop was to build an understanding of various best practices adopted by the State Governments. The Technical session was chaired by Shri Shakil Alam, Economic Adviser (Ministry of Mines).
- During the technical sessions, senior officials from State DMGs shared the initiatives implemented in their respective states. The workshop was well-attended by over 30 senior officials from state DMGs and 40 representatives from the mining industry.

- Shri V.L Kantha Rao, Secretary
Ministry of Mines addressing the participants

3.2 Thematic areas and sub-areas for the study

01 Mineral administration and mineral concession

- Regulatory reforms and strengthening authorities
- Administrative system/coordination between central govt. and IBM or other regulatory bodies
- Monitoring and tracking of illegal mining activities
- Robust tracking system for mineral transportation
- Oversight mechanism
- Revenue and penalty management
- Simplification of licensing and approvals
- Transparency and accountability
- International collaboration, advisory and consultancy
- Any other, to specify

02 Exploration and mines development

- Advance resource exploration techniques and technologies
- Strategic mine planning and design
- Data management and analysis
- Drill core libraries
- Aerial drone surveys
- Geological modeling and data integration
- Establishment of state mineral exploration trust
- Any other, to specify

03 Sustainable mining practices

- Sustainable development framework and implementation of star rating system for both major and minor minerals
- Environmental management
- Energy efficiency and emissions reduction
- Flora and fauna conservation
- Sustainable resource management
- Green mining technologies
- Economic sustainability and mines safety
- Any other, to specify

04 Technology, research and development

- Technology adoption and innovation
- Automation and remote operations
- Digital transformation
- Collaboration and innovation hubs
- Regulatory and standards framework
- Any other, to specify

05 Social project implementation

- Implementation framework
- Monitoring and evaluation
- Funding and resource allocation
- Community conflict resolution and feedback management
- Host community/Gram sabha consultation
- Any other, to specify

06 Mine closure, waste management, reclamation and rehabilitation

- Framework development
- Funding and financial assurance
- Standardized closure procedures
- Monitoring and evaluation
- Waste management and utilization
- Practice of earmarking and allocating common space for dumping of OB and waste outside the lease area
- Management of abandoned mines, development of ecotourism and livelihood-based activities

07 Skilling and capacity building

- Technical skills development for skilled workforce
- Workforce upskilling and continuous learning
- Capacity building for policy and regulatory compliance
- Industry-Academia partnerships
- Training, research and development
- Any other, to specify

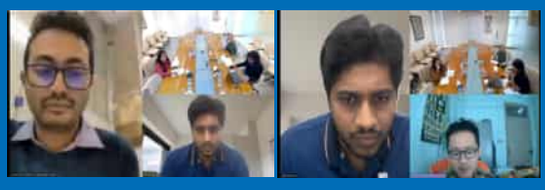
08 Forward integration into processing industries

- Value addition by miners into intermediate processes
- Ease of doing business initiatives by state government
- Dedicated logistics for consumption
- Technology and innovation

Workshops and stakeholders' meetings: Collaborative efforts for the study

Snapshots of online VC meeting with states' DMGs

The first consultation meeting with all states was held on 1 October 2024 via video conferencing. The meeting was chaired by Shri Shakil Alam, Economic Adviser (Ministry of Mines). Officials from State Directorate of Mines and Geology (DMGs) actively participated in this session.



- The study team also conducted one-on-one online interactions with officials from various states, including Assam, Punjab, Haryana, Gujarat, Goa, Mizoram and Uttarakhand, to gain a deeper understanding of the information shared on best practices.
- In-person interactions were also held with officials from the states of Rajasthan, Karnataka, Odisha, Andhra Pradesh, Tamil Nadu and Telangana.

04

Global and Indian mining scenario

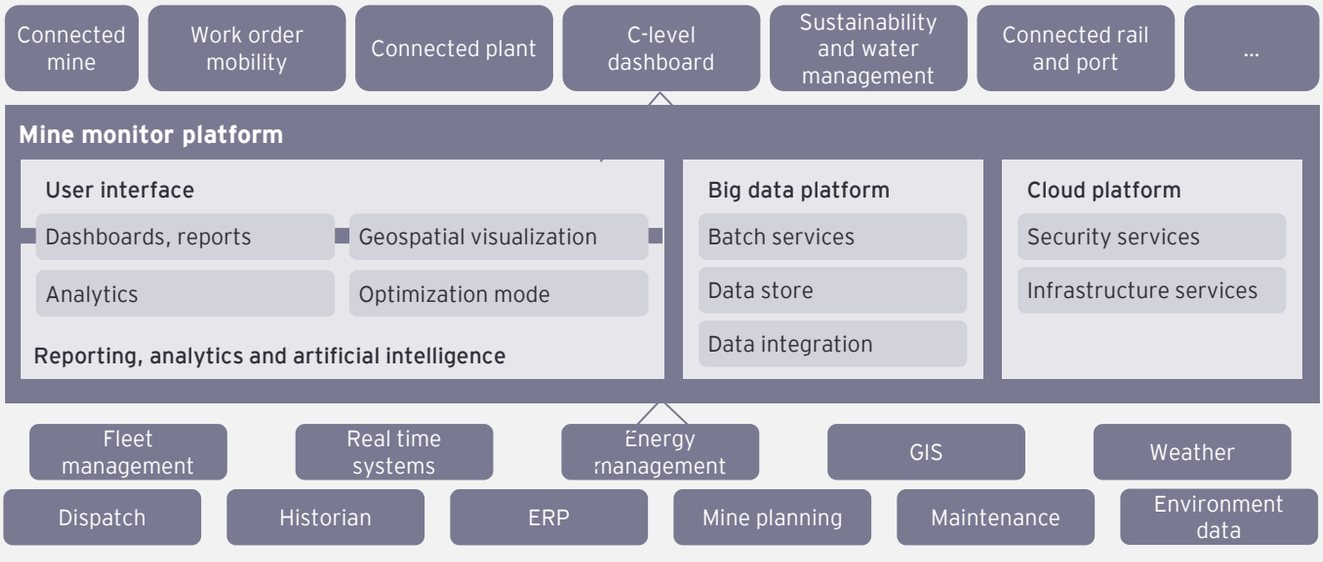
4.1 Industry structure and global outlook

Global evolutionary trends in mining

The global economy is displaying signs of slowly overcoming the meltdown amid the uncertain trade environment. Economies with a major impetus on industries have registered a recovery in their growth rates over recent years and are speculated to continue with a similar pattern in 2025 and beyond.

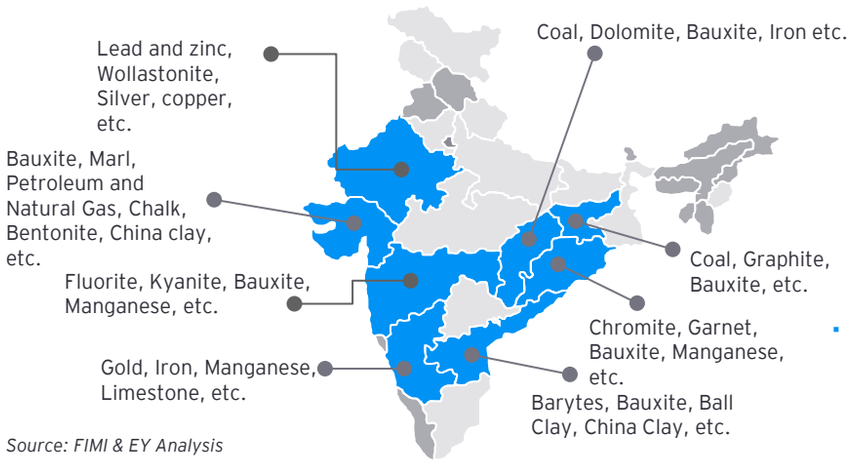
- The mineral supply is expected to be more volatile in the short term due to changing dynamics in key mining economies
  - Trade sanctions for Russia and Iran – both countries are ranked high on the Mineral Contribution Index, but the sanctions will limit the flow of commodities to the global market. However, in some exceptional cases, we may observe a deviation.
  - Limited investment expected in the United Kingdom – the uncertainty of Brexit has prompted trade partners to play safe and the new investments in mining are expected to be limited.
  - Change of regulations in Africa further adds to volatility in the mining supply – new mining code in the DRC, increased royalty taxes and GST in Zambia and finalization of mining charter in South Africa are the major recent developments in the African continent.
- Overall mineral demand is expected to rise with strong impetus on manufacturing and energy transition
- The increasing demand comes with significant environmental and socio-economic challenges. The mining sector is under immense pressure to align its operations with sustainable development goals (SDGs). This involves minimizing environmental impacts, reducing greenhouse gas emissions and ensuring the fair distribution of benefits among all stakeholders.
- Governments around the world have initiated measures and drafted policies to boost mining sector investments and promote sustainable mining practices in their respective geographies.
- Besides the changes in the market scenario, multiple changes are also expected on the technology front with the adoption of Industry 4.0.
  - As the number of tier one ore deposits is decreasing, large companies are expected to get replaced by medium-size companies or own scattered niche assets.
  - Big data is making big strides to provide the right data at the right time. This is expected to give the decision-making power to the operators rather than managers.
  - Virtual and augmented reality platforms are also being widely used in mining sector. E.g., In Pretoria, South Africa, Kumba Virtual Reality Centre for mine design uses Virtual Reality to provide 3D simulations which can serve both as an immersive training experience for mining personnel and providing better understanding to students with a better understanding of mining operations, performance improvement and health and safety standards.
  - IoT applications in mining is expected to increase, e.g., sensing devices to separate ore from waste and autonomous haulage systems will also become much more important and common in mines across the world.
  - Artificial Intelligence is a technology gaining fast traction in the global mining scene due to the efficiency, execution speed and reduced downtimes it can offer. Artificial Intelligence can provide support to the mining industry across all life stages of the mine, from prospecting to decommissioning.
  - The overall mine architecture is expected to move to digital with multiple layers consisting of ERP, mine planning, maintenance, dispatch, fleet management, data visualization and analytics, etc.

Figure 1: Digital mine architecture for the future



Source: EY analysis

India mineral distribution



Source: FIMI & EY Analysis

- India is richly endowed with minerals, producing up to 95 different types, including four fuels (e.g., coal), ten metallic minerals (e.g., iron ore), 23 non-metallic minerals (e.g., limestone), three atomic minerals (e.g., uranium), and 55 minor minerals. These are extracted from an extensive network of approximately 2045 mines.
- The country is largely self-sufficient in several key minerals, such as bauxite, chromite, limestone, iron ore and sillimanite. However, it faces shortages in minerals like coking coal, gold, diamond, copper and other critical minerals, necessitating imports to meet its demands.

Figure 2: Indian map depicting states with prominent minerals

Reserves and resources of key minerals in India (million tons)

Mineral	Bauxite	Coal	Copper	Iron ore	Limestone	Lead	Zinc
Reserves	646	199,904	164	6,412	19,028	103	103
Total resources	4,958	378,207	1,660	35,285	227,589	766	766

Indian mining over the years

FY20	FY21	FY22	FY23	FY24
Index of mineral production				
109.6	109.9	113.3	119.9	128.9
No. of reporting mines				
1385	1375	1323	2091	2045

FY20	FY21	FY22	FY23	FY24
Growth of industrial production*				
1.7%	-7.8%	12.2%	5.8%	7.5%
No. of mining leases and area (hectare)				
3,527	3437	3314	3095	3007
315,986 ha	312,645 ha	306,398 ha	278,008 ha	282,356 ha

*(Growth % over the corresponding period of previous year)

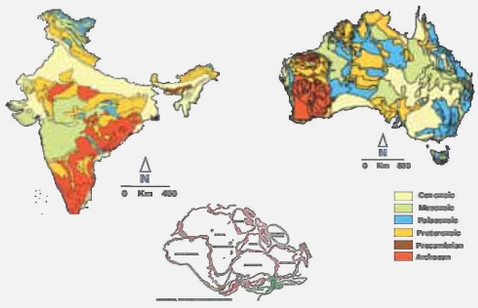
Share of economy

Share of mining in India's and Australia's GDP, %

Year	India	Australia
FY20	1.87%	11%
FY21	2.01%	11.5%
FY22	2.27%	14.6%
FY23	2.21%	14.6%
FY24	2.21%	12.2%

Source: FIMI analysis and Reserve Bank of Australia

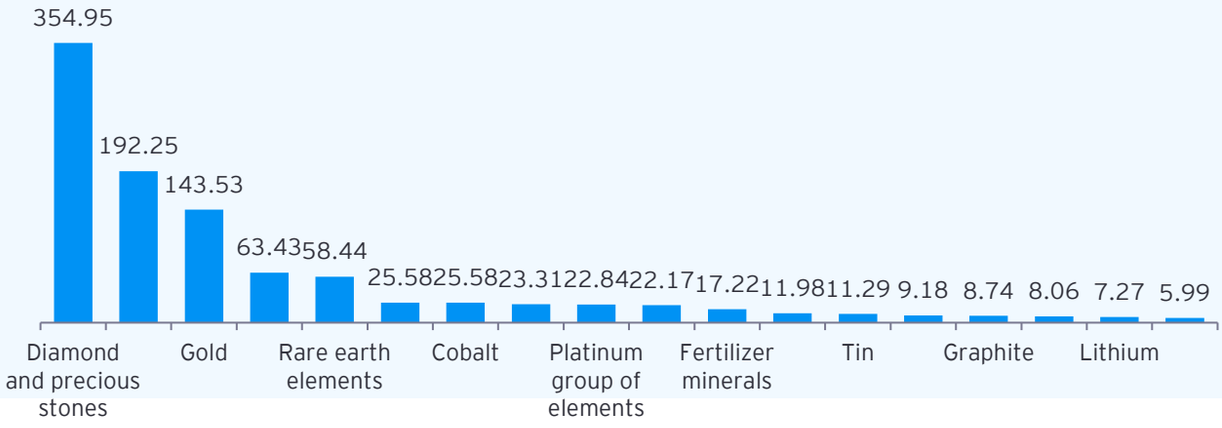
Figure 3: Comparison of geological strata of India and Australia



Source: Mining opportunities – realizing the potential, CII Report 2016

India's geographical strata is rich in minerals, with significant similarities to the Australian terrain. However, the Indian mining sector makes a meagre contribution to the nation's GDP compared to Australia. This is due to a combination of factors, such as regulatory and environmental challenges in obtaining approvals and clearances, inadequate and inefficient infrastructure and investment and technological constraints, among others. To ensure a robust economic contribution, the sector needs to adopt measures to address these challenges and boost revenue.

Figure 4: OGP areas in (Thousand sq.km) for various mineral commodoties-2020



Source: Mineral exploration in India at a glance -2020 – Geological survey of India, March 2020

India's mineral overview

Iron ore

India is among the top ten countries with significant iron ore resources, primarily consisting of Banded Iron Formations (BIF) dating back to the Precambrian era. The country's iron ore reserves mainly include hematite and magnetite, with hematite being the most important due to its high-grade quality, making it the preferred type for the Indian steel industry.

Bauxite and aluminum

Bauxite, the ore for aluminum production, places India fifth globally in reserves. Odisha leads in production, alongside Andhra Pradesh, Gujarat and Maharashtra, supporting India's aluminum industry, which is crucial for sectors like aerospace, construction and packaging. This industry is poised for robust growth driven by demand for lightweight and recyclable materials and proves to be strategic importance for renewable energy technologies, electric vehicles and defense.

Limestone

Limestone is indispensable for cement production, which is the cornerstone of India's infrastructure and housing development. India is blessed with extensive limestone deposits, primarily in Rajasthan, Madhya Pradesh, Andhra Pradesh and Gujarat. The cement industry consumes a significant portion of the limestone produced, supporting India's ambitious construction and urbanization goals. Additionally, limestone is used in industries such as steel, chemicals and agriculture, further underscoring its importance.

Metallic minerals

The booming construction industry for commercial and residential structures ensures a steady demand for metallic minerals. Rapid infrastructure development offers numerous growth opportunities for the mining sector. The industry also benefits from increasing emphasis on energy efficiency in major construction projects.

Source: EY analysis

Copper

Copper is indispensable for electrical wiring, electronics and renewable energy systems. India's copper reserves are concentrated in Rajasthan, Madhya Pradesh and Jharkhand, with major production centers like Khetri and Malanjkhand. The demand for copper is rising due to the growth of infrastructure, electric vehicles and renewable energy projects. Investments in refining and recycling are also helping to meet domestic needs while reducing dependency on imports.

Rare earth elements

India holds vast reserves of rare earth elements, primarily in the monazite sands along the coasts of Kerala, Tamil Nadu and Odisha. These elements are critical for advanced technologies, including electronics, renewable energy systems and defense applications. Despite its resource potential, India currently lags in the extraction and processing of REEs, with a significant portion of the global market dominated by other countries. The government is actively exploring policies and investments to develop domestic capabilities, recognizing the strategic importance of these minerals in a rapidly evolving technological landscape. India is investing heavily in the exploration and development of strategic minerals such as uranium, thorium and lithium. Uranium deposits in Andhra Pradesh and Jharkhand fuel the country's nuclear power program, while thorium-rich monazite sands along the southern coasts hold immense potential for future energy security.

Minor minerals

Minor minerals, including sand, gravel, granite and marble, are vital for construction and decorative purposes. Rajasthan and Tamil Nadu lead in the production of granite and marble, which are widely used in architectural and interior design.

The 'Make in India' initiative and the shift towards timely, quality project delivery have led to higher demand for modernized mining methods. Equipment manufacturers are encouraged to adopt digitization and innovative automated technologies for sustainable growth.

To maintain global competitiveness, India aims to maximize the utilization of its domestic reserves, particularly for coking coal used in iron ore reduction. Despite its mineral wealth, the sector has significant untapped potential, offering ample opportunities for further development. The Government of India is promoting 'Atmanirbhar Bharat' (self-reliant India) by implementing policy initiatives and regulatory changes in areas such as auction processes, duty levies and land availability.

Source: EY analysis

Contribution of mining sectors to the Indian economy

India's journey towards achieving its ambitious $5 trillion economy target by 2025 is gaining momentum, as evidenced by the International Monetary Fund's (IMF) upward revision of its economic projection for India to 6.3% for the current year, up from the previous 6.1% stated in the October 2023 World Economic Outlook (WEO) report. These projections highlight India's pivotal role in driving global economic growth, with the IMF maintaining its forecasts for China at 5.2% for 2023 and 4.0% for the following year.

A deeper analysis of the mining sector highlights its significant contribution to India's economic growth. A 1% increase in the mining sector results in approximately a 1.3% rise in industrial production and a 0.3% boost in India's GDP. Over the past five years, the mining sector's contribution to India's Gross Value Added (GVA) has steadily increased at a CAGR of 9%, maintaining a solid ~2% share of the overall Indian GVA. Realization of our growth aspirations, particularly with substantial investments in infrastructure, hinges significantly on further developing India's mining and coal sectors. Although India's mining sector contributes less than 2.5% to its GDP, it remains a vital component of the economy, comparable to countries like Russia, Chile, China, Indonesia and Australia, where mining and quarrying contribute 7-10% to their GDP.

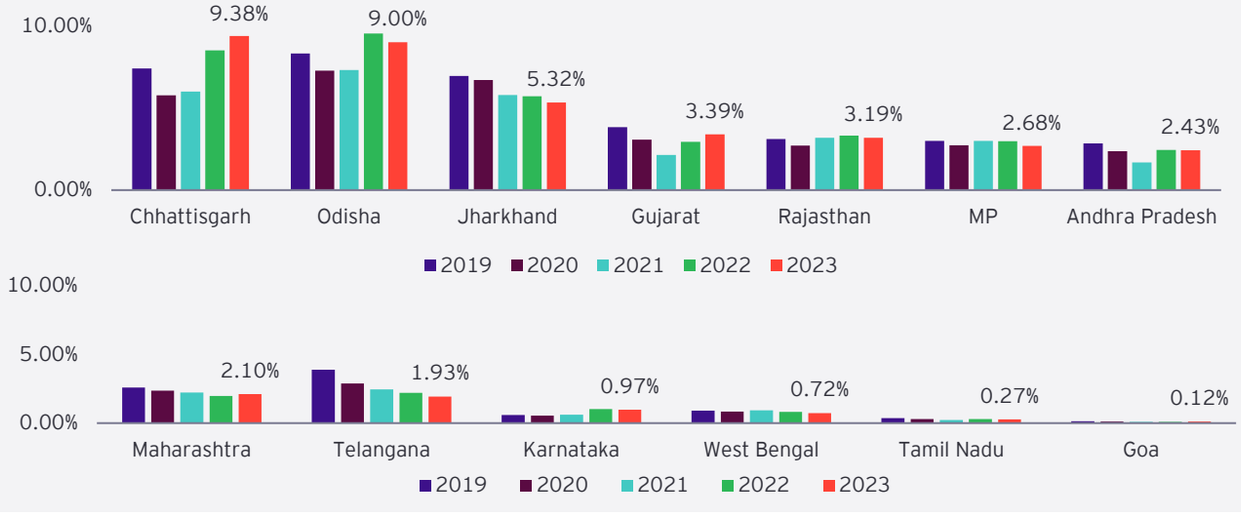
- The mining sector stands as a cornerstone of India's economy, with a significant influence on national growth. Beyond its direct contribution to GDP, it serves as the linchpin for the development of various industries such as cement, steel, power, iron and electrical. Moreover, the sector is a major source of employment, both directly in mining operations and indirectly in related industries, thus bolstering economic growth.
- It is one of the largest contributors to the labor workforce, directly employing 25.7 lakh people. Considering one direct mining job creates 10 additional indirect jobs, the total employment reaches 283 lakh people.
- Mining companies are increasingly engaging in Corporate Social Responsibility (CSR) initiatives, focusing on community development, education, healthcare and environmental sustainability to address the sector's impacts. Furthermore, India's abundant mineral resources, including coal, iron ore and metals, play a crucial role in exports, enhancing foreign exchange earnings and the trade balance.

India evolutionary trends in mining

The Indian mining and metal sector is undergoing a transformative phase, driven by several key trends shaping its trajectory and fostering sustainable growth. There is a strong emphasis on sustainability and environmental responsibility, exemplified by initiatives like Hindustan Zinc's commitment to invest US$1 billion by FY25 to achieve net zero carbon emissions. This shift towards greener practices is crucial for mitigating environmental impact and aligning with global standards. Moreover, digital transformation is revolutionizing the sector by optimizing operations and enhancing competitiveness in the global market, with companies like Tata Steel leveraging advanced technologies such as automation, artificial intelligence and IoT to improve efficiency and safety standards. Value addition and downstream integration are also gaining prominence, with investments in beneficiation and processing capabilities. Vedanta's expansion in aluminium smelting and power generation highlights the sector's drive to extract maximum value from raw materials, thereby boosting domestic production and reducing reliance on imports. Additionally, strategic partnerships and collaborations, both domestic and international, are fostering knowledge exchange and investment inflows. For example, collaboration between Indian and Japanese leading steel players underscores the sector's efforts to produce high-grade steel for critical industries like automotive.

Overall, the Indian mining and metal sector's growth trajectory remains promising, demonstrated by its resilience and potential on the global stage. With continued emphasis on sustainability, innovation and strategic partnerships, the sector is well-positioned for robust growth and increased competitiveness in the years to come.

Figure 5: State-wise mining contribution to states' GDP



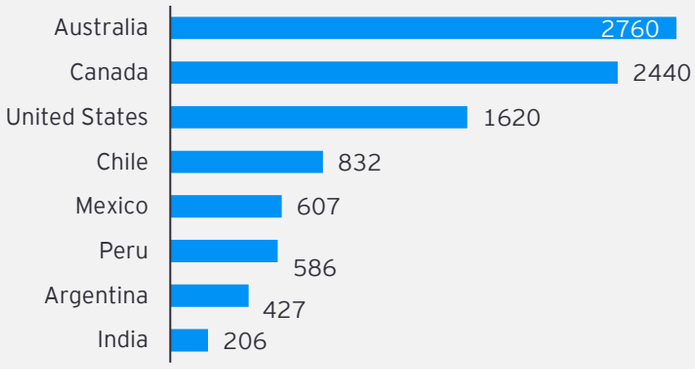
Source: Ministry of Statistics and Programme Implementation and EY Analysis

4.2 Factors impeding growth in India

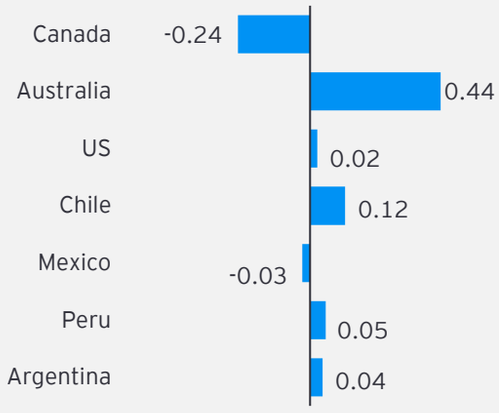
Insignificant mining exploration budget

India spends only ~1% of the global budget for mining exploration as stated by "Note on introducing exploration licence for deep-seated minerals and critical minerals" circulated by the Ministry of Mines vide Notice for Public Consultation dated 7 February 2023.

Mining exploration budget by country in 2022-23, (US$ million)



Country-wise budget change in 2022-2023, (US$ billion)



Source: Secondary Research & EY Analysis

Poor exploration of the area identified by geoscience

Only 22% of OGP has been mapped for deep-seated minerals. In India, exploration has mostly been restricted to a depth of 50 to 100 meters, compared to depths as deep as 300 meters in countries like Australia. The government has largely led geoscience and exploration activities, offering limited incentives for private players to enter the field. Canada reduced its mining budget due to shifting economic and environmental priorities.

Commodity-wise global exploration expenditure 2018-2023 (US$ billion)

Year	Gold	Base metals	Diamond	Platinum group of metals	Other minerals	Total
2018	4.81 (50%)	3.17 (33%)	0.19 (2%)	0.10 (1%)	1.35 (14%)	9.62 (100%)
2019	4.29 (50%)	3.23 (31%)	1.78 (19%)			9.30 (100%)
2020	4.33 (52%)	2.16 (26%)	1.83 (22%)			8.33 (100%)
2021	6.18 (55%)	3.25 (29%)	1.81 (16%)			11.24 (100%)
2022	6.92 (53%)-	6.18 (47.17%)				13.10 (100%)
2023	5.91 (46%)	6.85 (53.76%)				12.76 (100%)

Inconvenient approvals and licenses process

Indian mining approvals and permissions include approval of Grant of Mining Lease, Forest Clearance and Environmental Clearance from the central government on the state government's recommendation and varies across states which take four to five years as compared to six months in word's largest mining economies. Additionally, obtaining a Prospecting License or Composite License takes more than a year to process, whereas areas like British Columbia introduced an online exploration permitting process aiming to reduce turnaround time to 30 days.

Average approval time for mining rights

Time to process rights	Colombia	Botswana	South Australia	Brazil	Chile	Russia	South Africa	India
Months	1	<2	<2	2	7	12	>12	24-36
Unique qualities	Small licences issued within 13 - 20 days of submission	55 days to process excluding public consultation time	Reduced time from 4 years; introduced online application systems	Introduced fixed timelines for application processing	–	–	Current target in 12 months; far from promised 3-4 months	>90% applications take over 5 years

Source: EY analysis

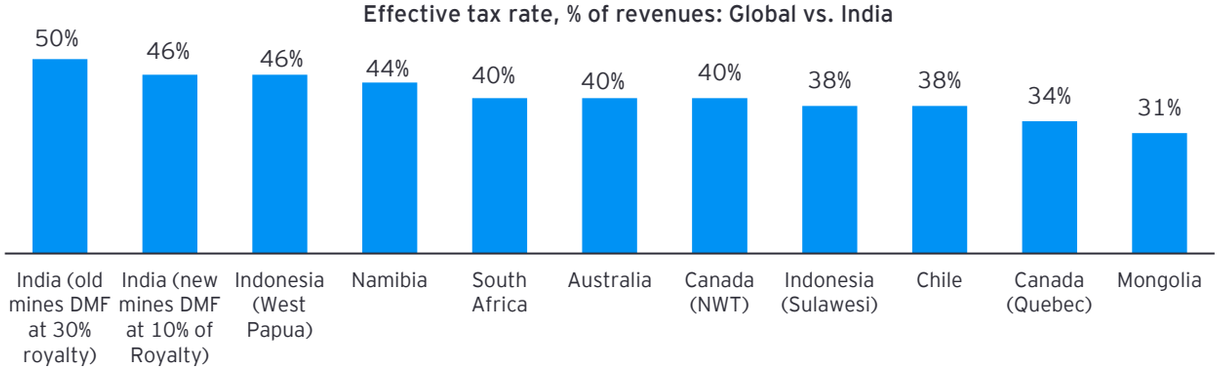
Production(%) of Surficial minerals & Deep-seated minerals for countries

Mineral	Surficial minerals	Deep-seated minerals
India	95%	5%
Western Australia	81.65%	18.35%
Canada	44.11%	55.89%

Source: FIMI analysis

The production value of deep-seated minerals in India is only 5% of its total value of mine production. However, the production value of deep-seated minerals in Western Australia and Canada is 18.35% and 55.89% respectively of their value of total mineral production.

Tax rates



- **High effective tax rate**

Barring the auction commitment, the effective tax rate is upwards of 50% of revenues compared to an average of 35% to 40% for other countries. The taxes in India include auction premium (at least 30% over base price), royalty (15% of revenue), DMF (10% of royalty), NMET (2% of royalty), GST (18% of royalty), corporate tax (same for all sectors, typically 30% of net profits) and upfront payments and performance security.

4.3 Recent initiatives taken for mining

Current Mining Regime

MMDR Act, 1957 amended - January 2015

- Mining leases to be granted through auction following amendment of Mines and Minerals (Development and Regulation) (MMDR) Act, 1957 w.e.f. 12-01-2015. Amendment provided auction as the sole mode of granting concessions to private companies.
- District Mineral Foundation (DMF) for development of mining-affected areas contribution by existing mines at 30% of royalty and by new mines @ 10% of royalty
- National Mineral Exploration Trust (NMET) for regional and detailed exploration; contribution by industry at 2% of royalty

National Mineral Policy (NMP) 2019

- Mineral bearing area/zone shall be earmarked as Mining Land in the land record by the states. (3.1)
- Special attention for exploration of strategic and deep-seated minerals which are otherwise difficult to access and for which the country is mainly dependent on imports. (4.3)
- Introduced Right of First Refusal for RP/PL holders. (4.4)
- Auctioning in virgin areas for composite RP-cum-PL-cum-ML on a revenue share basis. (4.4)
- Proposes to grant status of industry to mining activity to facilitate financing (6.7)
- Efforts to create Exclusive Mining Zone (EMZ) with prior in-principle statutory clearances and declaration of 'No-go areas' for mining in fragile environments. (6.10)
- Efforts to benchmark and harmonize royalty and other levies with other mining jurisdictions to make India an attractive destination for exploration and mining.(8)
- Expected Outcomes: To increase production of MCDR minerals (in value terms) by 200% in seven years; and to reduce trade deficit in minerals sector by 50% in seven years. (12)

Mineral Laws (Amendment) Act, 2020 – for coal

- On 13th March 2020, the Government of India opened commercial coal mining for the private sector by approving the methodology for auction of coal blocks for commercial sale.
- Amendment to provide for allocation of coal blocks for Prospecting Licence-cum-Mining Lease ("PL-cum-ML") to help in increase the available inventory of coal / lignite blocks for auction.
- Provisions for any company selected through auction / allotment to carry on coal mining operation for own consumption, sale without possessing any prior coal mining experience in India.
- FDI Policy in the coal sector allowing 100% FDI through automatic route for sale of coal, coal mining activities including associated processing infrastructure.
- Provisions to remove the requirement of previous approval in cases where the allocation or reservation of coal/ lignite block is made by the Central Government.
- Entitlement to an allottee to utilize mined coal in any of its plants or plants of its subsidiary or holding company.
- To implement it, corresponding Coal Mines Special Provision (CMSP) Rules and Coal Blocks Allocation (CBA) Rules were also amended.

Source: EY analysis

4.3 Recent initiatives taken for mining

Current Mining Regime

MMDR Amendment Act, 2021

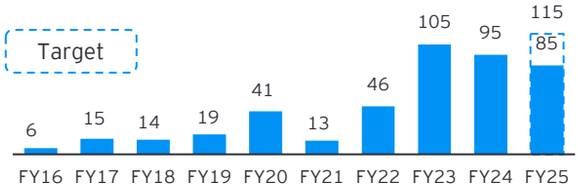
- Removal of NERP
- Redefining composite licence (diluting the norms of exploration level) with seamless transition to ML.
  - Mineral blocks for composite licence can be auctioned at G4 level of exploration instead of G3 level as per earlier standard.
  - Mineral block for surficial mineral can be auctioned for grant of mining lease at G3 level instead of G2 level
  - Private entities may be notified under Section 4(1) of the MMDR Act for conducting exploration
- Doing away with rights of existing concession holders and applicants' amendment/removal of Section 10A(2)(b), 10A(2)(c) – introduction of Section 10A(2)(d)
- Dispensing with the concept of captive and non-captive mines and removal of restriction on end-use of minerals.
- Transfer of mining leases allowed without any transfer charges irrespective of being auctioned / non-auctioned or captive / non-captive.
- Stipulation of timeline for grant of mining leases in the areas reserved for government companies.
- Removed the distinction between captive and merchant mines. It also allows all captive mines to sell up to 50% of the minerals produced during the year after meeting the requirement of attached plant subject to the payment of an additional amount as prescribed under the sixth schedule of the MMDR Act. Further, all future auctions will be without any end use restrictions.
- In the case of government companies, charging of additional premium on already extended / granted mining leases.
- Imposition of DMF charges @ 30% of royalty (instead of 10%) in the case of mining leases granted under Section 10A(2)(c) and Section 10A(2)(b).
- Validity of statutory clearances till the life of the mine irrespective of change of ownership.

MMDR Amendment Act, 2023

- MMDR Act, 1957 was amended as Mines and Minerals (Development and Regulation) Amendment Act, 2023 w.e.f. 17 August 2023. Some of the key highlights of amendments are as under:
  - Omission of 6 minerals from the list of 12 atomic minerals specified in Part-B of the First Schedule of the Act, namely, Lithium bearing minerals, Titanium bearing minerals and ores, Beryl and other beryllium bearing minerals, Niobium and Tantalum bearing minerals and Zirconium-bearing minerals.
  - Empowering the central government to exclusively auction mineral concessions for critical minerals specified in Part-D of the First Schedule of the Act. Revenue from these auctions will accrue to concerned state government.
  - Introducing exploration licence for deep-seated and critical minerals

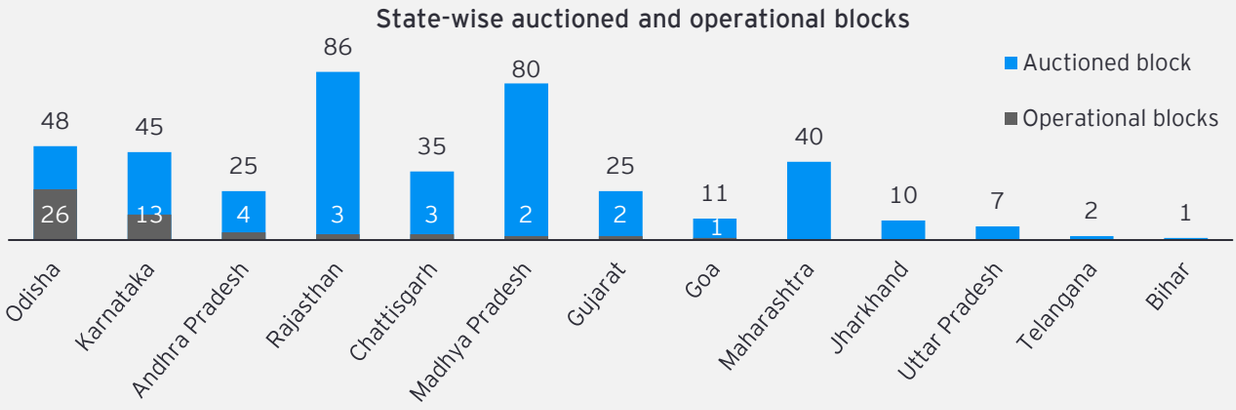
Impact of regimes on mine auctions

Year-wise national auction summary



Source: Ministry of Mines
Source: EY analysis

Introduction of these mining regimes has greatly benefitted the mining sector, resulting in a rise in the number of auctioned mines starting FY15, which witnesses a sluggish growth until FY21 post which the sector witnessed a spurring growth. FY22 registered 46 auctioned mines, growing more than threefold YoY. Auctioning of mines have yielded significant growth in the mining sector with accrued revenue amounting to INR 245,198 crores between FY16 and FY24 with 15% growth over FY05-FY15 revenue, which amounted to INR 68,942. States with auctioned mines till FY24 include Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Bihar, Jharkhand, Orissa and Telangana, among others and are expected to witness a rise in mines with an auction target set to 115 mines for FY25.



Source: Ministry of mines

Rajasthan leads in total auctioned mines with only 3% of the mines being operational while Odisha records more than 45% of the total mines being operational. Majority states have recorded lower operationalization rates (<10%) despite having significant auctioned mines owing to the absence of streamlined processes, inadequate policy support and infrastructure, thus impacting the domestic supply and demand scenario. With mineral demand anticipated to register robust growth in the coming years, it is imperative for the states to adopt best practices in mining to improve operationalization rates, thus strengthening domestic supply.

India supply demand scenario for key minerals: Historic and forecast (million tons)

	CAGR (%)	FY17	FY19	FY21	FY24	FY30
Iron ore	7%	143	160	214	235	350
	6%	192	206	204	280	428
Zinc-lead ore	7%	0.82	0.80	0.70	1.1	2.0
	5%	1.10	1.08	1.12	1.53	2.0
Bauxite	3%	20.94	22.17	21.35	25	30
	3%	24.67	23.69	20.37	23	35

Source: Elara Capital, BigMint, Indian Mineral Yearbook and EY analysis

Demand *Supply*

Iron Ore: In the base case, India is expected to maintain status quo with respect to iron ore demand supply balance. In an optimistic scenario, iron ore can provide opportunities to significantly increase exports.

Zinc-Lead ore: The current surplus in zinc is expected to saturate by 2025 based on the existing mines and announced upcoming new mines. Additional reserves need to be identified to continue to meet India's domestic zinc demands

Bauxite: The surplus is bauxite is expected to gradually reduce over the coming years in the base case scenario

India's mineral demand is expected to deliver robust growth driven by strong growth registered by various domestic end user industries thus making it necessary for the mining industry to pace up and adopt adequate measures equivalent to global best practices adopted by key mining economies to improve overall mining scenario through boost in revenues and operational efficiencies

Source: EY analysis

4.4 Detailed international best practices

Summary of practices across the leading countries:

Themes	Description	Countries
Mineral administration and mineral concession	Implement regulatory reforms and robust oversight mechanisms to ensure transparency, efficiency	Australia, Canada, South Africa, South America
Exploration and mines development	Implement with strategic planning, and design, for resource optimization	Australia
Sustainable mining practices	Implement through advanced environmental management and green mining technologies	Canada, South America
Technology, and research and development	Digital transformation and tech adoption for a smarter mining ecosystem	Australia
Social project Implementation	Community well-being through aligning strategic social project implementation and mining operations	Australia, Canada, South Africa
Mine closure, waste management, reclamation and rehabilitation	Ensuring mine closure and rehabilitation through standard procedures and waste management practices	Canada and Australia
Skilling and capacity building	Fostering a skilled mining workforce through targeted technical skills building and specialized training	South Africa, South America

Australia

Initiative	Impact
One-stop-shop for mining approvals: Various states (like Queensland and Western Australia) created online portals or consolidated regulatory agencies to centralize the application process which allow applicants to submit mining lease and environmental applications simultaneously and track them digitally	Reduces redundancy and ensures faster responses. E.g., Western Australia's Mines and Petroleum Department provides a platform to submit environmental, mining, and land use permits together
Predictable timelines: Several Australian states have set target timelines for approvals. For instance, in Western Australia, mining leases are typically granted within 90 days if all necessary information is provided and there are no significant issues.	This creates a clear, predictable process for miners and reduces uncertainty in project planning
EIA simplification for low-impact projects: In Queensland, smaller projects are assessed under a streamlined process that reduces both time and complexity. The Environmental Protection Act allows for early-stage approvals for low-risk projects.	Time spent on environmental assessments is minimized, improving overall approval timelines
Government initiatives for expedited approvals: Queensland, for example, has set a 30-day processing target for most exploration and mining-related permits and licenses.	This initiative has been instrumental in making exploration approvals faster and more predictable

Canada

Initiative	Impact
Towards Sustainable Mining (TSM): An initiative by the Mining Association of Canada that helps mining companies manage key environmental and social responsibilities. TSM includes protocols for tailings management, biodiversity conservation, and community engagement.	Enhances environmental and social performance, ensuring responsible mining operations. For example, TSM has led to a 30% reduction in reportable environmental incidents and a 20% increase in community engagement activities among participating companies.
e3 Plus Framework: Developed by the Prospectors and Developers Association of Canada, this framework provides guidelines for responsible exploration, including environmental stewardship, social responsibility, and health and safety.	Promotes environmental stewardship and social responsibility. Companies adhering to e3 Plus have reported a 15% reduction in environmental violations and a 25% improvement in health and safety performance.
Canmet MINING Research: A federal research organization focused on developing green mining technologies and practices. Canmet MINING works on enhancing energy efficiency, reducing environmental impacts, and repurposing mine waste.	Supports the transition to more sustainable mining operations. Canmet MINING's initiatives have resulted in a 40% increase in energy efficiency and a 35% reduction in greenhouse gas emissions in participating mines

Source: EY analysis

4.4 Detailed international best practices

Initiative	Impact
Mine Environment Neutral Drainage (MEND) Program : A collaborative initiative to address acidic drainage from abandoned mines, involving industry, government, and environmental organizations.	Mitigates environmental damage and restores ecosystems. The MEND program has successfully reduced acidic drainage by 50% at participating sites, saving an estimated US$2 billion in environmental remediation costs.
National Orphaned and Abandoned Mines Initiative (NOAMI): Focuses on addressing environmental issues caused by old mine sites, ensuring they are managed responsibly.	Ensures responsible management of abandoned mines, reducing environmental hazards and improving public safety. NOAMI has rehabilitated over 100 abandoned mine sites, reduced environmental risks and improved safety for nearby communities.

South Africa

Initiative	Impact
Environmental Impact Assessments (EIAs) : Mining companies are mandated to conduct detailed Environmental Impact Assessments before starting operations, evaluating potential environmental risks, and engaging stakeholders in the process.	EIAs help mitigate ecological disruption and ensure community concerns are addressed, leading to more sustainable mining practices and reduced conflicts with local populations.
Water Management Compliance: Strict adherence to water management regulations is required, focusing on responsible water usage, treatment and pollution prevention.	Effective water management protects vital resources, ensuring sustainability for both the environment and local communities that rely on these water sources.
Biodiversity conservation: Initiatives like the South African Mining and Biodiversity Forum promote practices that protect local biodiversity during mining activities.	Prioritizing biodiversity helps reduce the ecological footprint of mining operations and supports the preservation of native species.
Community Consultation Protocols: Mining companies must establish transparent communication channels with affected communities, involving them in decision-making processes regarding mining projects.	Effective community engagement builds trust, secures a social license to operate, and minimizes conflicts, ultimately leading to more harmonious relationships between miners and communities.
Development Programs: Companies are encouraged to implement community development initiatives that provide benefits such as education, infrastructure improvements, and economic opportunities for local populations.	These programs contribute to local socioeconomic development, enhance quality of life for community members, and foster goodwill towards mining operations
Regulatory Framework Compliance for Mining operations: Must adhere to national legislation such as the National Environmental Management Act (NEMA) and the Mineral and Petroleum Resources Development Act (MPRDA), mandating sustainable development principles.	Compliance with these regulations ensures responsible mining activities that balance economic growth with environmental protection and social responsibility

South America (Brazil, Chile)

Initiative	Impact
Integrated Licensing System: Brazil's Integrated Environmental and Mining Licensing System allows both environmental and mining permits to be processed together and helps save time by reducing redundant steps in the permitting process.	Reduces overall approval times by streamlining environmental and mining right approvals into a more efficient combined process
Simplified Approvals for Small-Scale Projects: For smaller mining projects with minimal environmental impact, Brazil's Environmental Impact Assessment (EIA) process has been simplified so that projects may only need a Short Environmental Report (RCA), which reduces approval time.	Smaller projects face fewer regulatory hurdles, speeding up the approval process for operators and promoting investment in low-impact operation
Streamlined Environmental Assessments: Chile's Environmental Impact Assessment System (SEIA) allows for fast-track approvals for projects deemed low-risk including smaller exploration projects or those with minimal environmental impact can be approved in as little as 6 months.	Smaller projects experience less bureaucratic delay and quicker turnaround times for permits, boosting efficiency for operators
Automated Mining Permit System: Chile's National Mining Agency has implemented an online permitting system that enables companies to submit applications for mining rights, track progress, and receive updates in real-time.	This has resulted in faster processing times, as all documentation is centralized and available digitally for review
Community and Stakeholder Engagement: Chile emphasizes early stakeholder consultations with local communities and Indigenous groups to reduce risk of delays due to protests or legal challenges.	By engaging stakeholders early, Chile reduces the likelihood of opposition and lengthy legal battles, speeding up approval processes

05

Initiatives taken by various states

5.1 Key themes of successful practices

Mineral administration and mineral concession
Includes facilitation of permits and approvals through streamlined processes

Exploration and mines development
Focus on identifying new resources enabled by digitalization and strategic collaboration with global agencies

Technology, and research and development
Leveraging advanced technologies and digital initiatives across to improve operational efficiency

Social project implementation
Adopting initiatives that develop communities and mines restoration and rehabilitation

Sustainable mining practices
Includes initiatives that promote sustainable measures and carbon reduction through afforestation

Mine closure and waste management
Promoting effective management practices for abandoned mines and proper waste management

Skilling and capacity building
Initiatives that promote development through safety standards and trainings for mining operations

Forward integration to processing industries
Enabling consumption of mining output through forward integration with intermediates and downstream industries

5.2 In-depth analysis of initiatives across focus themes

5.2.a. Mineral administration and mineral concession (1/2)

Auction of minor mineral blocks	▪ **Initiative overview**: Auction of Minor Mineral blocks mandates the allocation of minor mineral resources through an e-auction system. This initiative aims to increase transparency, ensure competitive bidding, and boost revenue for the state. ▪ **Sample examples:** States of Andhra Pradesh Assam, Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Odisha Rajasthan are allocating leases through auction route. ▪ **Outcomes**: AP has notified 799 Minor Mineral Blocks and successfully auctioned 275 Blocks till now.
Outsourcing the right of seigniorage fee/royalty to third-party agencies	▪ **Initiative overview :** Outsourcing the collection of Seigniorage Fee/Royalty to third-party agencies involves delegating the responsibility of managing and collecting royalties or fees from mining operations to an external agency.A Pilot system of outsourcing the right of collection of seigniorage Fee and other levies to third party agencies is initiated in seven districts in Andhra Pradesh. ▪ **Sample examples**: Andhra Pradesh ▪ **Outcomes:** Assured revenue stream to State Exchequer, Department resources are used in the value- added activities
Allocation of sand mines in reverse auction route	▪ **Initiative overview : The** allocation of sand mining blocks is conducted through a reverse auction process. Under this system, sand mines are auctioned to private contractors or companies through an online reverse auction platform. A district level committee establishes the ceiling price for Sand mines and no bid is acceptable if it is below 50% of the ceiling price ▪ **Sample examples**: Chhattisgarh ▪ **Outcomes :S**and mines reverse auction has significantly improved transparency, price control, and prevented monopolies in the sand mining sector in Chhattisgarh.
Inter-departmental collaboration for auction approval	▪ **Initiative overview :** A multi-disciplinary, inter-departmental committee including representatives from Forest, Law, and other departments meets and discuss the issues pertaining to the auction of identified mineral blocks ▪ **Sample examples**: The states of Madhya Pradesh, Odisha, Gujarat and Andhra Pradesh have set up an interdepartmental committee to expedite the approval process for the auction of identified mineral blocks. ▪ Outcomes: Madhya Pradesh has increased the number of auction blocks by adopting Inter-departmental collaboration
Facilitating compensatory afforestation	▪ **Initiative overview :** Compensatory afforestation involves planting trees on equivalent non-forest land or double the area on degraded forest land, equivalent to the area diverted for non-forest purposes. The State Mining Department collaborates with the State Forest Department to identify degraded or non-forest land suitable for compensatory afforestation. ▪ **Sample examples** : Madhya Pradesh and Chhattisgarh ▪ **Outcomes:** The State Mining Departments play a pivotal role in bridging the gap between industrial development and environmental conservation in the mining sector. By enforcing afforestation mandates, facilitating land availability, and promoting sustainable practices, they contribute to mitigating the ecological impact of mining activities.
Issuance of lease on double royalty for minor mineral	▪ **Initiative overview** :The policy requires mining leaseholders to pay double the standard royalty rates for private lands up to 4 hectare in minor minerals, ensuring that the state gains greater economic benefits while promoting environmental stewardship and community welfare. ▪ **Sample examples :** Gujarat ▪ **Outcomes:** The implementation of double royalty has substantially boosted the state's revenue from minor mineral mining. Small-scale miners, while operating on limited land, contribute more to the exchequer due to the increased royalty rates.

5.2 In-depth analysis of initiatives across focus themes

5.2.a. Mineral administration and mineral concession (2/2)

Pre-embedded clearances	▪ **Initiative overview:** Pre-embedded clearances is an initiative adopted to streamline the process of granting mining leases and boost sectoral efficiency. This initiative is designed to reduce the time and effort required to start mining operations by ensuring that essential regulatory clearances are pre-obtained before auctioning mineral blocks ▪ **Sample examples:** Madhya Pradesh, Gujarat and Odisha ▪ **Outcomes:** State of MP have mentioned that Out of four blocks (Dadartola Dadar Bauxite Block, Gudha Limestone Block, Muariya Base metal Block, Jariyari Bauxite Block) blocks given to MPSMCL, two blocks (Gudha Limestone Block, Muariya Base Metal Block) will be available for auction by Aug 2025 and the remaining two blocks to be put up for auction in Dec 2025.
Mineral Dealer license system	▪ **Initiative overview** :The Mineral Dealer License System regulates the trade, storage, and transportation of minerals and is managed by the state's Department of Mines and Geology. It is an Online IT regulatory mechanism deployed to track mineral movement and consumption by onboarding mineral dealers and linking with leases. ▪ **Sample examples :** Andhra Pradesh and Odisha ▪ **Outcomes:** The licensing system, coupled with the e-Permit System, has strengthened the monitoring of mineral transportation, thereby reducing unauthorized mining operations
Post-Auction Facilitation Cell	▪ **Initiative overview** :The Post-Auction Facilitation Cell (PAFC) is established to provide comprehensive assistance to auction winners, ensuring they can effectively navigate through the challenges and comply with regulatory and procedural requirements. ▪ **Sample examples :** Rajasthan, Madhya Pradesh and Odisha ▪ **Outcomes:** By providing critical support to successful bidders, accelerating the commencement of mining operations, and ensuring regulatory compliance, PAFCs significantly contribute to the growth of the mining industry and the broader economy.
Online e-permit system	▪ **Initiative overview** :The online e-permit system for mining activities has been introduced by several Indian states to streamline the process of obtaining permits for mining, transportation, and trade of minerals. This digital initiative aims to improve transparency, reduce corruption, enhance efficiency, and ensure the traceability of mineral extraction and movement across the country. ▪ **Sample examples :** AP, Chhattisgarh, Gujarat, Haryana, Jharkhand and Karnataka ▪ **Outcomes: Chhattisgarh Khanij online portal** has facilitated the issuance of 10,033 e-permits for mineral transit.
Auction of sand mines	▪ **Initiative overview:** The auction of sand mines in India is an initiative aimed at regulating the extraction of sand, promoting transparency, curbing illegal mining, and ensuring proper revenue generation for state governments. ▪ **Sample examples:** Madhya Pradesh, Odisha and Rajasthan ▪ **Outcomes:** Madhya Pradesh - Successfully auctioned 40 sand clusters. Increase in revenue from INR887 crore in FY 2022-23 to INR 1243 Cr in FY 2023-24.

Unique initiatives in mineral administration and mineral concession

Outsourcing the right of Seigniorage fee/Royalty to third-party agencies
Allocation of Sand Mines in Reverse auction route
Post-Auction Facilitation cell
Pre-embedded clearances
Facilitating Compensatory Afforestation
Issuance of lease on double royalty for minor mineral
Inter-departmental collaboration for auction approval

5.2 In-depth analysis of initiatives across focus themes

5.2.b Exploration and mines development

Digitization, segregation and categorization of past exploration data	▪ **Initiative overview**: Use of digital platforms for exploration data management. By digitizing geological, geochemical, and geophysical data, the state ensures better tracking of mineral resources. State of Gujarat in between 2018 and 2020 undertook the initiative of digitization and geo-referencing of all exploration reports. ▪ **Sample examples:** Gujarat and Odisha ▪ **Outcomes**: Digitalization of exploration reports has helped Gujarat to identify 189 mineral potential blocks for future exploration endeavors.
Strategic collaboration with global exploration agencies	▪ **Initiative overview**: Strategic collaboration with global exploration agencies will revolutionize the mineral exploration landscape by providing a systematic, scientific, and sustainable approach to identify and harness its mineral resources. These agencies bring unparalleled expertise, access to state-of-the-art tools, and proven methodologies for resource mapping and management. ▪ **Sample examples:** Odisha ▪ **Outcomes**: Efficient resource mapping can attract domestic and international investments. Modern techniques can help explore deep-seated and less accessible mineral reserves.
Establishment of State Mineral Exploration Trust	▪ **Initiative overview**: State Mineral Exploration Trust (SMET) is a dedicated body established by state governments to support and enhance mineral exploration activities, promote sustainable mining practices, and manage mineral resources effectively ▪ **Sample examples:** Rajasthan ▪ **Outcomes**: SMET facilitates systematic and advanced exploration of mineral resources by funding and supporting geological surveys and studies.
Collaboration with PSU for Exploration projects	▪ **Initiative overview**: MOIL, DGM, and MPSMCL signed a Memorandum of Understanding (MoU) whereby MOIL will conduct exploration for Manganese ore in Madhya Pradesh at its own expense. If commercially viable reserves are found, a Joint Venture (JV) shall be formed, and application to reserve the block in the name of said JV will be submitted. ▪ A Joint Venture agreement was executed on 18 Oct 2024, during the Madhya Pradesh Mining Conclave, 2024. ▪ **Sample examples:** Madhya Pradesh, Odisha and Chhattisgarh
MoU with CSIRO, Australia	▪ **Initiative overview**: Odisha Mining Corporation (OMC) has entered into a significant partnership by signing a Memorandum of Understanding (MoU) with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) of Australia. This collaboration is set to provide OMC with valuable technical guidance and expertise for the development of a state-of-the-art Drill Core Library. ▪ **Sample examples:** Odisha ▪ **Outcomes;** The drill core library will have a storage capacity of 6,00,000-8,00,000 meters of drill core. CSIRO has equipped the laboratory with state-of-the-art instruments for detailed analysis of drill cores.
Petrography and mineral chemistry laboratory	▪ **Initiative overview**: The Petrography and Mineral Chemistry laboratory is equipped with modern mineral testing equipment like an X-ray Diffractometer, Atomic Absorption Spectrophotometer, etc. It has the distinction of being recognized as Research and Development Laboratory for minerals. ▪ **Sample examples:** Gujarat and Odisha ▪ **Outcomes**: The laboratory processes numerous samples, for instance, around 1,404 half-split core samples were recently sent for testing.

Unique initiatives in exploration and mines development

Digitization, segregation and categorization of past exploration data
Establishment of State Mineral Exploration Trust
Strategic collaboration with global exploration agencies for mineral exploration
Petrography and mineral chemistry laboratory

5.2 In-depth analysis of initiatives across focus themes

5.2.c Technology, and research and development – 1/2

Vehicle Tracking Management System	▪ **Initiative overview**: Vehicle Tracking Management System is a system that aims to transform the way vehicle movements are monitored and managed across the state. VTMS harnesses cutting-edge technologies such as GPS (Global Positioning System), GIS (Geographic Information Systems), and real-time data analytics to create an efficient, transparent, and secure transportation network. ▪ **Sample examples :** Gujarat, Andhra Pradesh, Goa, Jharkhand, MP and Odisha ▪ **Outcomes**: Andhra Pradesh has integrated over 54,000 vehicles into its VTMS, linked to the OMEPS portal; the mobile app has over 5,000 downloads and a total of 83,09,265 e-permits have been issued since its launch.
Mine Surveillance System	▪ **Initiative overview :** Mine Surveillance System is used to detect and curb illegal mining activities. This system uses satellite imagery to monitor mining regions, with a focus on areas within 500 meters of existing mining leases. If unusual activity is detected, the system generates triggers, which are then forwarded to the state authorities for further verification through on-the-ground visits. ▪ **Sample examples** : Chhattisgarh and Maharashtra have adopted the Mine Surveillance system ▪ **Outcome:** States like Chhattisgarh with the help of MSS were successful in identifying unauthorized mining operations and violations of lease boundaries
Drone Survey for Quarries and Sand Mines	▪ **Initiative overview** : Drone Survey for Quarries employs cutting-edge drone technology to conduct precise aerial surveys, monitor mining activities, and perform a volumetric analysis for more efficient and sustainable resource extraction ▪ **Sample examples :** Karnataka, Odisha, Kerala, MP, Punjab ▪ **Outcomes**: MP has successfully conducted Drone Survey at 130 stockyards, with the data thoroughly analyzed for accuracy and insights.
Sand Mine Portal	▪ **Initiative overview**: Dedicated sand portal is developed for transparent and efficient management of sand mining operations. Entire activity from the onboarding of Sand Mines Group to the issuance of e-transit pass is computerized. ▪ **Sample examples:** Madhya Pradesh and Odisha ▪ **Outcomes**: Ease of access and convenience: The portal allows users to apply for sand mining licenses and permits online, streamlining the process and reducing bureaucratic delays. ▪ The Sand Mining Portal promotes transparency in the sand mining process by providing real-time data on sand availability, pricing, and regulatory compliance.
E-Check Gate implementation	▪ **Initiative overview**: E-Check Gate ensures real-time monitoring of mineral transportation using RFID, ANPR cameras, and WIM sensors for overloading detection. Field officers can conduct on-the-spot inspections with handheld devices, while a web app handles audits, e-TP validation, and e-notice issuance. ▪ **Sample examples:** Madhya Pradesh and Odisha ▪ **Outcomes**: E-check gates have been installed at four locations (Eitkhedi, Neelbadh, Bangarsia, Obaidullaganj) in Bhopal district, with plans to complete installation of an additional 37 locations by December 2024.

Source: EY analysis

5.2 In-depth analysis of initiatives across focus themes

5.2.c Technology, and research and development – 2/2

Recycling of minerals in India

Highlights:

- Govt. of India is in the process of designing the Production linkage incentive (PLI) that will target e-waste recycling, incentivise the production of recycled critical minerals, and promote investments in advanced recycling technologies.

Outcomes:

- Circular value chains that reuse and recycle End of Life RE system components can help create value by reducing both the use of primary materials in RE technology manufacturing and the waste generated from decommissioned projects.
- Creation of an uninterrupted supply of low-cost clean energy technologies (CETs).

S&T-PRISM initiative

Highlights:

- In 2023, under the R&D component of S&T program of the Ministry of Mines "Promotion of Research and Innovation in Start-ups and MSMEs in mining, mineral processing, metallurgy and recycling sector (S&TPRISM)" was introduced to fund research and innovation in starts-up and MSME to bridge the gap between R&D and commercialization.

Outcomes:

- During 2024, under the R&D Component of Science and Technology Programme of the Ministry of Mines, 10 R & D Projects related to extraction, recovery and recycling of critical minerals have been approved for taking up through various Indian Institutes and research laboratories.

Critical Minerals mission for continuous supply

Highlights:

- Govt of India launched Critical Minerals mission in 2024. This mission seeks to ensure a continuous supply of critical minerals to the Indian industry by encouraging domestic exploration, mining, and production.
- The supply of primary or virgin minerals remains challenging, a substantial quantity of minerals can be obtained from secondary sources.

Outcomes:

- Estimates suggest that a circular economy approach to critical minerals could reduce the demand for primary minerals by nearly 18% by 2030. This will, however, require the establishment of efficient processing facilities within the country.
- Critical minerals obtained from secondary sources within the country will reduce the material intensities of CETs and help reduce India's import dependence.

Bilateral and multilateral engagements for minerals processing

Highlights:

- Internationally, through bilateral and multilateral engagements, India has been participating in many discussions that can potentially solve not just India's but the global R&D related challenge of concentration of critical minerals and its processing in the hands of few countries.

Outcomes:

- India was invited as the only developing country to join the Mineral Security Partnership (MSP). India represented the interests of the developing countries that are most vulnerable to global supply chain shocks.
- India also partnered with Australia, through the India-Australia Comprehensive Economic Cooperation Agreement (CECA) in 2022, to collaborate on upstream critical mineral technologies.

Unique initiatives in technology , and research and development

Vehicle Tracking Management system
Drone Survey of Quarries and Sand Mines
Sand Mine Portal
S&T-PRISM Initiative

5.2 In-depth analysis of initiatives across focus themes

5.2.d Social project implementation

DMF Portal	▪ **Initiative overview** : The District Mineral Foundation (DMF) Portal was introduced to enhance transparency and streamline the distribution of funds aimed at the welfare of mining-affected communities. The state government created this platform to ensure the efficient use of DMF funds for socio-economic and environmental betterment in regions impacted by mining activities. ▪ **Sample Examples** : Chhattisgarh and Odisha ▪ **Outcomes**: As of 2023, the DMF in Chhattisgarh has collected over INR6,000 crores, nearly INR600 crores have been used to ensure clean drinking water, Over INR1,200 crores have been allocated to healthcare projects, including the construction of hospitals and mobile medical units
Mines and Mineral Restoration and Rehabilitation fund	▪ **Initiative overview** : As per the Haryana District Mineral Foundation Rules, notified on 19 Dec 2017, the mines in operation are liable to pay an additional amount of 7.5% to a fund namely Mines and Mineral Restoration and Rehabilitation Fund. the state government is also contributing 2.5% of the amount received by the Government on account of the dead rent, royalty and contract money. ▪ **Sample examples:** Haryana ▪ **Outcomes**: fund is mainly to be used to work for the interest and benefit of persons and areas affected by mining and other mining-related operations.
Malnourishment treatment van (MNV)	▪ **Initiative overview** : MNV was initiated with an objective to create a sustainable approach for improvement in reducing the malnourishment of the targeted area. ▪ **Sample examples :** Jharkhand ▪ **Outcomes:** 5421 household were surveyed in phase one out of which 579 malnourished children were treated in the targeted area.
Establishment of lemon grass distillation unit in Bokaro	▪ **Initiative overview** : DMFT (District Mineral Foundation Trust), Bokaro, has sanctioned a Lemon Grass Distillation unit with a packaging, storage, and production capacity of 2,400 liters and handed over to Luguburu Farmer Producer Company for market linkage. ▪ **Sample examples :** Jharkhand ▪ **Outcomes**: The project started with a fund of INR19 Lakhs is expected to benefit more than 500 farmers.

Unique initiatives in social project implementation

District Mineral Foundation Portal
Mines and Mineral Restoration and Rehabilitation fund

Source: EY analysis

5.2 In-depth analysis of initiatives across focus themes

5.2.e Sustainable mining practices

Star rating of minor minerals

- **Initiative overview** : Mines with an area > 4 Ha is considered for star rating of 31 minor minerals. The system rates mines based on criteria that assess the environmental, operational, and safety standards of mining activities.
- **Sample examples** : Chhattisgarh
- **Outcomes**: The star rating of minor minerals in Chhattisgarh is a progressive initiative aimed at promoting transparency, enhancing compliance, and encouraging sustainable mining practices.

M-Sand Policy

- **Initiative overview** : M- Sand Policy introduced by the Government of Karnataka is a progressive step toward promoting the use of manufactured sand (M-Sand) as an alternative to natural river sand for construction purposes. With growing concerns over the environmental degradation caused by excessive river sand mining, states have formulated a comprehensive policy to regulate and promote M-Sand Production.
- **Sample examples** : Karnataka, UP and Rajasthan
- **Outcomes**: By promoting the use of manufactured sand, the policy has reduced the strain on natural sand resources, curbed illegal mining, and provided more eco-friendly alternative for construction materials.

Unique initiatives in sustainable mining practices

Star rating of minor minerals
M-Sand Policy

5.2.f Mine closure, waste management, reclamation and rehabilitation

Dumping of overburden and waste outside the lease area for minor minerals

- **Initiative overview** : In order to prevent wastage of overburden and to utilize the same during quarry closure, a provision is laid down in KMMC Rules to remove and store the same outside lease area. Prior approvals are required from the DMG, Kerala and other relevant authorities to dump the overburden or waste outside the lease area.
- **Sample examples** : Kerala
- **Outcomes**: . By enforcing strict regulations, promoting sustainable practices, and focusing on rehabilitation, the state has taken significant steps to mitigate the environmental impacts of mining activities.

Management of abandoned mines

- **Initiative overview** : Management of Abandoned mines is an initiative to transform abandoned into productive zones that benefit the environment, local communities, and the economy. Abandoned mines are repurposed for cultivating vegetables, pisciculture, and water storage for agricultural purposes, addressing critical needs for food security, water conservation, and rural livelihoods.
- **Sample examples** : Kerala
- **Outcomes:** Kerala's reclamation efforts have successfully led to improvements in soil health, biodiversity restoration, and the reduction of safety hazards at many abandoned mines.

Unique initiatives in mine closure, waste management, reclamation and rehabilitation

Dumping of overburden and waste outside the lease area for minor minerals
management of abandoned mines

Source: EY analysis

5.2 In-depth analysis of initiatives across focus themes

5.2.g Skilling and capacity building practices

Human resource development (learning and development and capacity building)	▪ **Initiative overview** : The policy is dedicated to fostering a strong learning culture that prioritizes the improvement of employee skills. By focusing on continuous professional and personal growth it ensures that employees are well-prepared to excel in their roles. Through investment in training and development programs, the policy aims to create a flexible and skilled workforce capable of meeting industry demands and contributing to the overall success of the organization. ▪ **Sample Examples** : Odisha ▪ **Outcomes**: The state's Vision 2030 aims to achieve over 50% value addition to primary metals, boosting employment in the downstream metal sector. Collaboration with ITEES, Singapore, enhances local workforce skills through vocational training. With over 170,000 graduates annually from over 950 training institutions, the state attracts investors. Additionally, it hosts globally recognized educational and research institutes, establishing it as a knowledge hub.

5.2.h Forward integration for processing

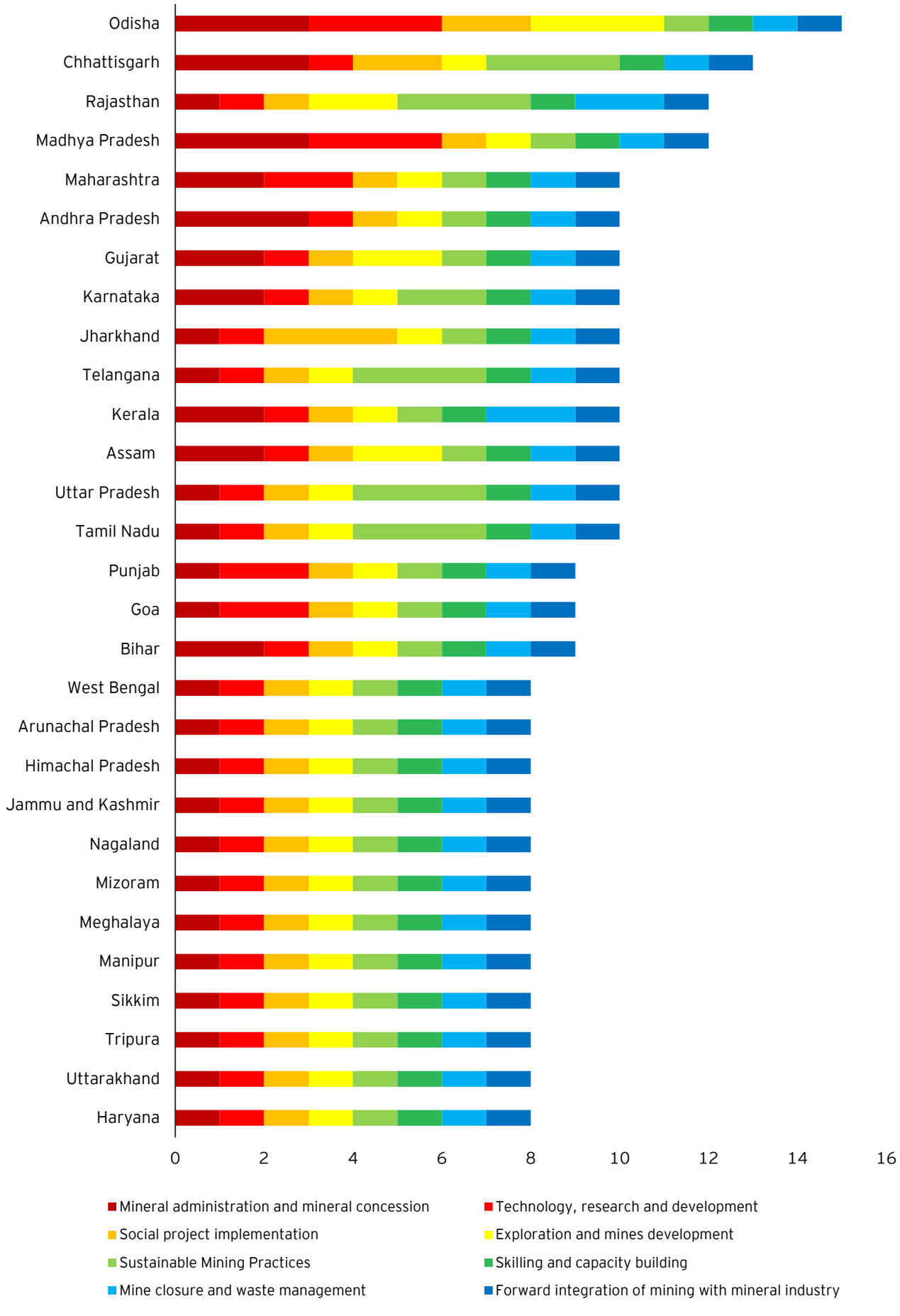
The forward integration of mining and mineral processing industries in India is a crucial strategy for enhancing operational efficiency, sustainability and economic viability. This approach addresses the challenges faced by the mining sector, such as environmental concerns, resource depletion, and the need for technological advancements, while positioning India as a competitive player in the global minerals market.

Value addition by miners into intermediate process	▪ **Initiative overview** : Stakeholders adding value by integrating intermediate processes such as crushing, grinding, washeries for beneficiation, pelletization among others to enhance industry's overall efficiency, profitability and sustainability ▪ **Sample examples** : Jharkhand, Odisha and Chhattisgarh ▪ **Outcomes**: States announced plans to establish new coal washeries to develop the quality of domestic coking coal and reduce import dependency
Ease of doing business initiatives by state government(s)	▪ **Initiative overview** : Industry stakeholders are collaborating for larger projects with downstream players to develop infrastructure and regulatory framework ▪ **Sample examples** : Odisha ▪ **Outcomes**: Entered MoUs with companies to develop bauxite and iron ore mines and enhance value additions for establishing processing plants and improve availability of raw materials for downstream industries
Dedicated logistics for consumption	▪ **Initiative overview** : Mining industry has adopted several measures to develop logistics corridors to improve efficient transportation from mines to processing plants integrated ▪ **Sample examples** : Jharkhand, Odisha and Chhattisgarh ▪ **Outcomes**: Developed Smart Coal Logistics Plan, Dedicated Freight Corridors for facilitating the movement of bulk commodities and Port Connectivity Projects among others
Technology and innovation	▪ **Initiative overview** : Integrating emerging digital technologies into mining operations to improve efficiency, sustainability and profitability ▪ **Sample examples** : Odisha and Chhattisgarh ▪ **Outcomes**: Higher recovery rates, use of flotation techniques to enhance mineral recovery during processing and improve resource manufacturing

In addition to these states, India's leading mining and mineral companies are actively pursuing forward integration strategies. These include incorporating advanced digital technologies in exploration, mining and processing. They are also establishing the necessary infrastructure to facilitate logistics, which improves beneficiation and mineral resource management.

Source: EY analysis

5.3 States' initiatives summary



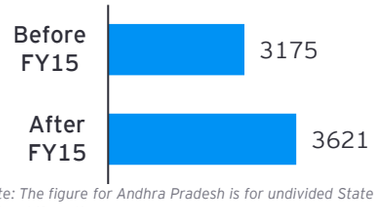
Source: EY analysis

5.4 State-wise initiatives and outcomes

1. Andhra Pradesh

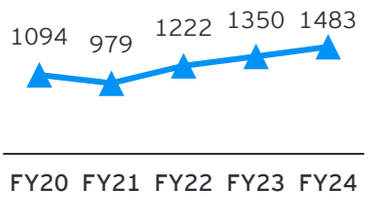
KPIs so far....

(Revenue Pre & Post Auction), INR Cr

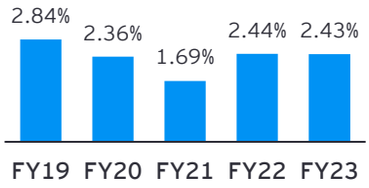


Note: The figure for Andhra Pradesh is for undivided State before bifurcation.

Value of mineral production, INR Cr



Mining contribution (%) to State GDP



Andhra Pradesh Mineral Scenario

- Andhra Pradesh, located in the southeastern part of India, is one of the country's richest states in terms of mineral resources. With its diverse geological formations, the state boasts an impressive variety of minerals that cater to the needs of several key industries, including construction, cement, glass, ceramics, electronics, and energy production.
- Its strategic location, with access to both the Eastern Ghats and a long coastline along the Bay of Bengal, enhances its mining potential. Over the years, Andhra Pradesh has emerged as a significant contributor to India's mining sector, making it a hub for mineral-based industries and a key player in the export of resources such as granite and heavy minerals.
- The state is not only endowed with abundant mineral reserves but also possesses a well-developed infrastructure for mining, processing, and transportation of minerals. Major industrial clusters and mining regions in Andhra Pradesh are supported by road, rail, and port connectivity, which facilitate both domestic and international trade. Furthermore, the state's proactive governance and focus on resource-based economic development have attracted significant investments from domestic and international players, making it a preferred destination for mining-related industries.

What's going on so far...

- Andhra Pradesh is enhancing its mining sector by attracting investments and improving resource management. The government is preparing for the Global Investors Summit, focusing on transparent mineral block auctions and a single-window clearance system to facilitate project approvals.
- The Andhra Pradesh Mineral Development Corporation aims to generate an additional ₹500 crore this year by promoting value-added mineral industries. The state has rich mineral resources, including bauxite and barytes, and is developing Heavy Mineral Beach Sands for industries like aerospace.
- To address rising sand demand, the state plans to operationalize 108 new sand reaches, ensuring compliance with regulations. Overall, Andhra Pradesh is positioning itself as a key player in the mining industry while effectively navigating regulatory and environmental challenges.

Best Practices adopted by Andhra Pradesh

1 **Thematic areas - Mineral administration and mineral concession**

Auction of Minor Mineral Bearing areas

Andhra Pradesh has introduced the Minor Mineral Auction Rules 2022, which mandate the allocation of minor mineral resources through an e-auction system. This initiative aims to increase transparency, ensure competitive bidding, and boost revenue for the state. The Mines and Geology Department oversees the process, issuing leases, permits, and licenses while regulating mineral excavation and transportation

Highlights:

- Department will issue a letter of intent (LOI) to the preferred bidder within 15 days
- Department to initiate the process of obtaining NOC from the Revenue Dept.
- DGPS Survey along with surveyed sketch of the area to be provided
- Applicants to get LOI immediately on payment of Premium Amount

Outcomes :

- Till now, Dept. of Mines & Geology has notified 799 Minor Mineral Blocks and successfully auctioned 275 Blocks
- Seigniorage will now be fixed based on tonnage of the material which is estimated to increase income for the state between 35-40%

Source: State Ministry information received and secondary research

2 Online Mineral E-Permit System (OMEPS):

Online Mineral E-Permit System (OMEPS) in Andhra Pradesh is a digital platform developed by the Department of Mines and Geology to simplify the process of applying for and managing mineral permits. This system serves a wide range of stakeholders, including leaseholders, quarry operators, transporters, and stockists

Features and Highlights of the system:

- This portal is distinguished from any other such portal owing to its ability to segregate the payments received from the leaseholders into various revenue heads automatically online
- Registration of Lessees and Payment of Royalty and DMF through IT
- Application for Check Measurement
- Issue of Dispatch Permit & Transit Passes
- Maintenance of Production Particulars
- Adherence to Annual Mining Plan, Environmental clearance & Consent For Establishment

Outcomes

- Digitization of permits has streamlined all the activities involved thereby making the whole process time efficient and thus allowing the leaseholders to obtain transit forms anytime and anywhere
- With real-time tracking and online accessibility, stakeholders can monitor the status of their applications
- This system has also been integrated with Comprehensive Financial Management System (CFMS).

3. Outsourcing the right of collection of Seigniorage Fee/ Royalty to third party Agencies

- Challenges faced:
  - Due to lean structure of DMG and involvement in mineral revenue administration, for most of the time district officers not able to invest optimum efforts to achieve long-term goals such as lease administration, identification of mineral bearing areas, auction, etc

- **Features and Highlights**
  - A pilot system of outsourcing the right of collection of seigniorage Fee and other levies to third party agencies is initiated in 7 districts
  - Reserve price for the auction is fixed by considering the following:
  - Dispatches, Royalty collections during previous years
  - Market demand and export quantity
  - Growth projections

- **Outcomes**
  - Contract was awarded through e-auction process and assured revenue stream to State exchequer
  - Departmental resources to be used in value-adding activities such as identification of mineral bearing areas, lease grant, auction etc..
  - Reduction in illegal mining activity due to adequate contractual manpower deployment

4 Mineral Dealer License System:

The Mineral Dealer License System in Andhra Pradesh regulates the trade, storage, and transportation of minerals and is managed by the state's Department of Mines and Geology. It is an Online IT regulatory mechanism deployed to track mineral movement and consumption by onboarding mineral dealers and linking with leases

- **Key Features of Mineral Dealer Licence system**
  - Comprehensive System: No manual intervention from online application filing, processing & grant of MDLs, payment, issuance of transit passes
  - Mineral Accountability: Ensures accountability & traceability throughout the mining value chain by control over the source of raw materials
  - Automated Validation: Automated validation by configuring wastage parameters, integration with OMEPS, and secured stationary

- **Outcomes**
  - The licensing system, coupled with the e-Permit System, has strengthened the monitoring of mineral transportation, thereby reducing unauthorized mining operations
  - This system enables dealer to file an application online and obtain self-generated transit passes without levying any fee except nominal user charges
  - System facilitates the transfers of the stocks from leaseholder to dealer, dealer-to-dealer in line with the physical stock transportation and enables the departmental staff to monitor real time stock movement

5 Inter Departmental Co-Ordination:

Inter-departmental collaboration offers several significant benefits that enhance efficiency, transparency, and overall effectiveness in the process

- **Highlights:**
  - Periodical district level inter-departmental co-ordination meetings organized under the chairmanship of District Collectors
  - Periodic state level meeting with SEIAA, APPCB, Revenue and Forest Dept. under the chairmanship of Chief Secretary of AP.

- **Outcomes :**
  - Improved Efficiency and Reduced Delays: Collaboration among various departments, such as finance, legal, and procurement, streamlines the auction approval process.

6 Hand Holding division:

This focus on providing timely guidance, clarifications, and resources to ensure a seamless bidding process. This includes assessing bid submissions for compliance, addressing queries promptly, and offering assistance to enhance bidder confidence and participation

- **Highlights:**
  - A dedicated hand holding division created at Head Office, aiding the leaseholders in grievance redressal. It identifies the issues grappling the leaseholders and sought facilitation

- **Outcomes :**
  - Increased auctionability rate, attracting more bidders
  - Decreased statutory clearance time, Accelerated commencement of mining activities

7 Geo fencing:

All the leases in the State are surveyed using DGPS and geo-fenced which helps in monitoring of illegal mineral transportation from the lease boundaries. The use of drones would begin from January 2025. The vigil will be maintained jointly by mines, commercial taxes and transport departments. An action plan is already in place.

- **Features and Highlights**
  - 3-D pictures would be taken of the areas where mining is allowed. This would help in determining geo-coordinates for the area given on lease.
  - All along the route the mineral is transported, CCTV cameras would be installed. All the vehicles that transport minerals would have GPS trackers
  - The state government is losing about ₹5 crore to ₹6 crore per day revenue because the excess minerals from the area that the lessee mines are not accounted for
- **Outcomes**
  - The department hopes to net an additional income of ₹2,000 crore through a penalty on illegal mining. The government also hopes to collect seigniorage and mining cess regularly from the lessees.
  - Geo-fencing ensures that mining activities remain within legally permitted areas, aiding compliance with governmental regulations

▸ **Thematic Area: Technology, research and development**

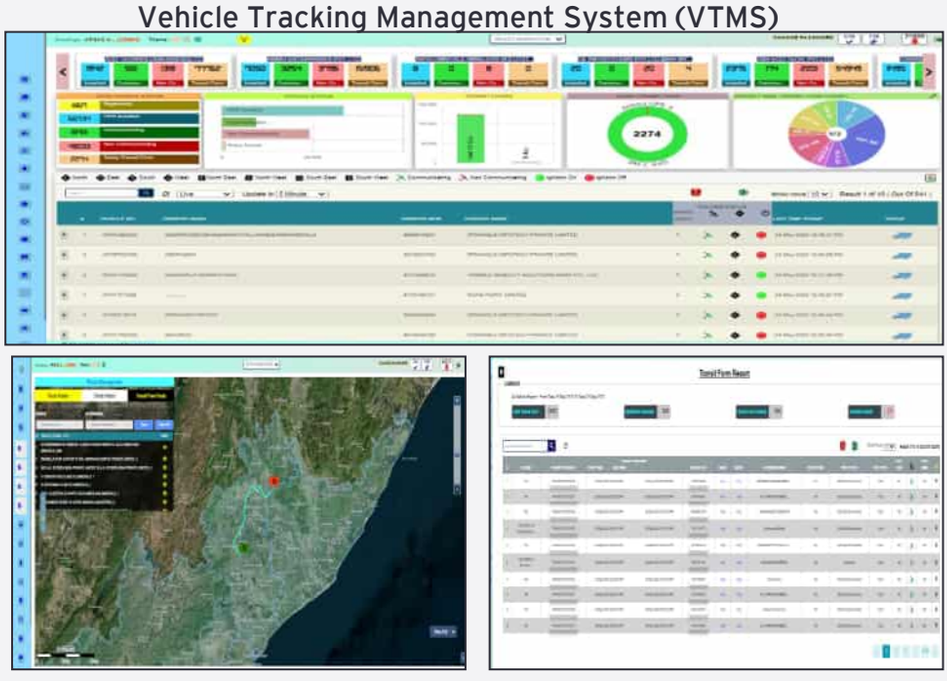
8 Vehicle Tracking Management system:

The Vehicle Tracking Management System (VTMS) in Andhra Pradesh is an initiative implemented by the Department of Mines and Geology. It is designed to monitor mineral transport vehicles using GPS technology to ensure compliance with mining regulations and improve transparency. It is used as an Online Platform for real time surveillance of mineral carrying vehicles

- i. Installation of GPS devices was made mandatory for Vehicles transporting minerals
- ii. The system generates alerts to the District Vigilance Squads (DVS) & District Officers in the following circumstances
  - a. Route deviations
  - b. Device tampering
  - c. Prohibited mines

- **Features and Highlights**
  - AIS-140 is the Intelligent Transport System (ITS) that the government of India have designed to optimize and secure the efficiency of the transport system
  - The integration enables leaseholders to generate permits only when the GPS device is actively communicating
- **Outcomes**
  - The system has more than 54,000 vehicles onboarded and are integrated with the OMEPS portal
  - Mobile app launched with 5000+ downloads till date
  - Total 83,09,265 e-permits generated since inception

Vehicle Tracking Management System (VTMS)



Summary of Initiatives & Recommendations - AP (1/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Andhra Pradesh						

 No initiatives adopted
 *0-25% initiatives adopted*
 *25-50% initiatives adopted*
 *50-75% initiatives adopted*
 *>75% initiatives adopted*

S.No	Initiative adopted	Impact from adoption of Initiative
1	Auction of Minor Mineral Bearing areas	▪ Till now, Department of Mines & Geology has notified 799 Minor Mineral Blocks and successfully auctioned 275 Blocks ▪ Seigniorage will now be fixed based on tonnage of the material which is estimated to increase income for the state between 35-40%
2	Online Mineral E-Permit System	▪ Digitization of permits has streamlined all the activities involved, allowing the leaseholders to obtain transit forms anytime and anywhere ▪ With real-time tracking and online accessibility, stakeholders can monitor the status of their applications ▪ This system has also been integrated with Comprehensive Financial Management System (CFMS).
3	Outsourcing the right of collection of Seigniorage Fee/ Royalty to third party Agencies	▪ Contract was awarded through e-auction process and assured revenue stream to State exchequer ▪ Departmental resources to be used in value-adding activities such as identification of mineral bearing areas, lease grant, auction etc. ▪ Reduction in illegal mining activity due to adequate contractual manpower deployment
4	Mineral Dealer License System	▪ The licensing system, coupled with the e-Permit System, has strengthened the monitoring of mineral transportation, thereby reducing unauthorized mining operations
5	Inter Departmental Co-Ordination	▪ Collaboration among various departments, such as finance, legal, and procurement, streamlines the auction approval process
6	Hand Holding division	▪ Decreased statutory clearance time, Accelerated commencement of mining activities
7	Geo fencing	▪ The department hopes to net an additional income of ₹2,000 crore through a penalty on illegal mining. The government also hopes to collect seigniorage and mining cess regularly from the lessees. ▪ Geo-fencing ensures that mining activities remain within legally permitted areas, aiding compliance with governmental regulations
8	Vehicle Tracking Management system	▪ The system has more than 54,000 vehicles onboarded and are integrated with the OMEPS portal ▪ Mobile app launched with 5000+ downloads till date ▪ Total 83,09,265 e-permits generated since inception

Recommendation

Mineral Administration and Mineral Concession	Other states have adopted other initiatives: Pre-embedded clearances for auction and Post auction facilitation establishment Facilitating Compensatory Afforestation These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	Other states have been actively pursuing initiatives: Digitization, Segregation and Categorization of Past Exploration data/ reports Strategic Collaboration for Mineral Resource Mapping Establishment of State Mineral exploration trust Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation

Summary of Initiatives & Recommendations - AP (2/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Andhra Pradesh						

No initiatives adopted


0-25% initiatives adopted


25-50% initiatives adopted


50-75% initiatives adopted


>75% initiatives adopted

Recommendation

Sustainable Mining Practices

Other states have adopted other initiatives:
M-Sand Policy
Star Rating of Minor Minerals
Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development

Technology, research and development

Other states have adopted other initiatives:
Mine Surveillance system
Drone Survey of Quarries
E-Check gate implementation
Sand Mine Portal
These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.

Social project implementation

Other states have adopted other initiatives:
DMF Portal
Mines and Mineral Restoration and Rehabilitation Fund
Upgradation of Healthcare services
These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Mine closure, waste management , reclamation and rehabilitation

Other states have adopted the initiatives:
Management of Abandoned mines
Dumping of Overburden and waste outside the lease area for Minor minerals
These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Skilling and Capacity Building

Other states have adopted the initiatives:
Human Resource Development
This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

For more information, visit the following website: Mines

5.4 State-wise initiatives and outcomes

2. Assam

Assam Mineral Scenario

- Assam, a state in the northeastern part of India, is endowed with a variety of valuable mineral resources that play a pivotal role in its economic development and industrial landscape. Renowned as one of the country's oldest oil-producing regions, Assam's mineral profile is unique, with energy resources like crude oil, natural gas, and coal dominating the sector.
- These resources form the backbone of India's energy security and contribute significantly to regional and national economic growth.
- Beyond energy resources, the state also harbours substantial reserves of limestone and other minor minerals that support industries like cement, construction, and petrochemicals.
- This wealth of minerals has facilitated the development of key industries in Assam, including oil refining, fertilizer production, and cement manufacturing, driving employment and infrastructure growth

What's going on so far...

- Assam has been involved in broader efforts to auction critical mineral blocks. Recently, the government completed the auction of 24 strategic mineral blocks across India, including some in Assam. This move is part of a national strategy to enhance mineral resource management and support clean energy technologies
- The North-Eastern Coalfields unit of Coal India has resumed operations at its Tikak colliery, which is expected to significantly contribute to coal supplies in the region.
- In December 2023, the Assam government initiated an auction for seven limestone mines in Dima Hasao district. This area is rich in mineral deposits crucial for cement production.

Best Practices adopted by Assam

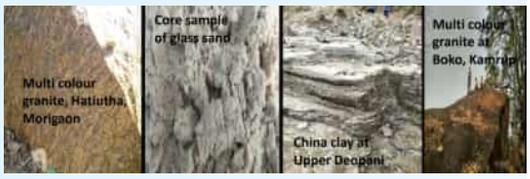
Thematic Area: Mineral Administration

1 **E-Auction of Minor Mineral**

The e-auction system for minor minerals is a transformative initiative by the Assam government aimed at ensuring transparency, efficiency, and fairness in the allocation of minor mineral resources. By leveraging digital technology, this system eliminates manual interventions, prevents illegal mining, and maximizes revenue generation for the state

- **Highlights:**
  - Bidders intending to participate in this auction are required to register on the portal https://www.mstcecommerce.com
  - The details of eligibility criteria, experience, auction schedule and other terms and conditions are available in the Auction document on the portal
  - The e-auction system is designed to comply with government regulations, ensuring that all transactions are conducted legally and ethically
  - All minor minerals listed in Assam Minor Minerals Concession Rules, 2013 and its amendments viz. Building stones, Gravel, Ordinary clay, etc have adopted e-auction

- **Outcomes :**
  - By allowing a larger pool of bidders to participate, the e-auction system can lead to higher bids for mineral contracts, resulting in increased revenue for the state government
  - An online system adopted viz. eGRAS portal for getting revenue (royalty, DMF, MMDRR fund, other taxes etc.)
  - By adopting e-auctioning method, royalty generation is higher. In Assam, other than Govt. works and PP land owners, all lease, contracts of minor minerals are settled through e-auction



Photographs of minerals:
Ref. E-auction Notice No. GM/ET/842/696
Dated 13.07.2021

Source: State Ministry information received and secondary research

2 Thematic Area: Technology, research and development

E-Samiksha Portal:

In eSamikSha portal, anybody can upload the querry for approval needed for Statutory clearance etc. It is a Digital Government Platform for Easy, Instant and Secure Exchange of Information headed by the Chief Secretary of Assam.

- **Features and Highlights of the system:**
  - The follow-up action in respect of each decision is to be updated by the concerned Department/Agency as and when the status changes or at least every month.
  - Different users can securely access the system through a log-in/password. This system can also be configured to review the follow up action in respect of other meetings, if required.
- **Outcomes**
  - Constant monitoring and consistent follow-up
  - Transparent & expedited process
  - Improve coordination between central and state governments

3 Thematic Area: Social Project Implementation

State Level Monitoring for DMFT activities:

A State-level Monitoring Committee has been constituted. The committee, chaired by the senior-most Secretary of the Mines and Minerals Department, is responsible for providing guidance and overseeing the district-level activities of the District Mineral Foundation Trust (DMFT)

- **Features and Highlights of the system:**
  - The Nodal Officer collects data from various districts on a monthly basis, scrutinizes the information related to DMFT and PMKKKY, and submits the consolidated data to the Central Government.
  - The Directorate of Geology and Mining, organizes virtual meetings with DMFT Cells of different districts periodically to monitor and review the data and ensure effective implementation
  - At least 60% of the DMFT funds are to be utilized for high-priority areas such as drinking water, healthcare, education, etc. The remaining 40% can be used for other priority areas
- **Outcomes**
  - 94.50 Cr were collected till 2021 under DMF and 33.13 cr were spent
  - Projects completed up to October, 2024: 411 nos.
  - Rs. 100.6156 crores spent in DMF initiatives over the last five years

4 Skill development projects:

The State Government of Assam has undertaken various skill development projects under the Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) using the DMFT (District Mineral Foundation Trust) Fund

- **Features and Highlights of the system:**
  - These skill development initiatives primarily focus on training in areas such as arts and crafts, farming, and animal husbandry, aiming to enhance the livelihood opportunities for local communities in these districts
- **Outcomes :**
  - A total of 30 projects have been initiated across several districts:
  - Cachar District: 10 projects, Baksa District: 3 projects
  - Dima Hasao District: 11 projects , Tinsukia District: 2 projects
  - Dibrugarh, Karbi Anglong, Lakhimpur, and Charaideo Districts: 1 project each

Source: State Ministry information received and secondary research

Summary of Initiatives & Recommendations - Assam (1/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Assam						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1	E-Auction of Minor Mineral	▪ The e-auction system is designed to comply with government regulations, ensuring that all transactions are conducted legally and ethically ▪ By allowing a larger pool of bidders to participate, the e-auction system can lead to higher bids for mineral contracts, resulting in increased revenue for the state government ▪ An online system adopted viz. eGRAS portal for getting revenue (royalty, DMF, MMDRR fund, other taxes etc.) ▪ By adopting e-auctioning method, royalty generation is higher. In Assam, other than Govt. works and PP land owners, all lease, contracts of minor minerals are settled through e-auction
2	E-Samiksha Portal	▪ Constant monitoring and consistent follow-up ▪ Transparent & expedited process ▪ Improve coordination between central and state governments
3	State Level Monitoring for DMFT activities	▪ 94.50 Cr were collected till 2021 under DMF and 33.13 cr were spent ▪ At least 60% of the DMFT funds are to be utilized for high-priority areas such as drinking water, healthcare, education, etc. The remaining 40% can be used for other priority areas ▪ Projects completed up to October, 2024: 411 nos. ▪ Rs. 100.6156 crores spent in DMF initiatives over the last five years
4	Skill development projects	▪ A total of 30 projects have been initiated across several districts: ▪ Cachar District: 10 projects, Baksa District: 3 projects ▪ Dima Hasao District: 11 projects ▪ Dibrugarh, Karbi Anglong, Lakhimpur, and Charaideo Districts: 1 project each ▪ Tinsukia District: 2 projects

Recommendation

Mineral Administration and Mineral Concession

- Other states have adopted other initiatives:
- Pre-embedded clearances for auction and
- Post auction facilitation establishment
- Facilitating Compensatory Afforestation
- These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines

Exploration and Mines development

- Other states have been actively pursuing initiatives:
- Digitization, Segregation and Categorization of Past Exploration data/ reports
- Strategic Collaboration for Mineral Resource Mapping
- Establishment of State Mineral exploration trust
- Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation

Summary of Initiatives & Recommendations - Assam (2/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Assam						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Sustainable Mining Practices

- Other states have adopted other initiatives:
- **M-Sand Policy**
- **Star Rating of Minor Minerals**
- Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development

Technology, research and development

- Other states have adopted other initiatives:
- **Mine Surveillance system**
- **Drone Survey of Quarries**
- **E-Check gate implementation**
- **Sand Mine Portal**
- These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.

Social project implementation

- Other states have adopted other initiatives:
- **DMF Portal**
- **Mines and Mineral Restoration and Rehabilitation Fund**
- **Upgradation of Healthcare services**
- These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Mine closure, waste management , reclamation and rehabilitation

- Other states have adopted the initiatives:
- **Management of Abandoned mines**
- **Dumping of Overburden and waste outside the lease area for Minor minerals**
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment

Skilling and Capacity Building

- Other states have adopted the initiatives:
- **Human Resource Development**
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance

For more information, visit the following website: https://mines.assam.gov.in/

5.4 State-wise initiatives and outcomes

3. Bihar

Bihar Mineral Scenario

- Bihar, located in the eastern part of India, is endowed with a variety of mineral resources that play a crucial role in its economic development. Although not as mineral-rich as some other states, Bihar's mineral wealth contributes significantly to both local industries and the national economy.
- Bihar is known for its deposits of non-metallic minerals such as limestone, which is essential for cement production, and bauxite, which is used in aluminum manufacturing. Additionally, the state has reserves of iron ore, coal, and graphite, which are vital for various industrial applications. The presence of these minerals supports key sectors including construction, manufacturing, and energy production.
- The mineral deposits in Bihar are primarily concentrated in regions like the Kaimur Plateau and the Chotanagpur Plateau, where geological formations provide a favorable environment for mining activities. These areas are crucial for the extraction of minerals that support both local economies and larger industrial frameworks.

What's going on so far...

- Preparations are underway for opencast mining to begin in six blocks across Rohtas, Gaya, and Jamui districts. This marks the first significant mining activity since the separation of Jharkhand from Bihar in 2000. The blocks include minerals such as glauconite potash, nickel chromium, limestone, and magnetite
- The Mines and Geology department plans to conduct explorations in old mines with assistance from experienced officials from the Geological Survey of India (GSI), particularly targeting strategic minerals found in old mica mines across several districts
- The Bihar government anticipates earning approximately ₹5,000 crore from the auction of mineral blocks, including glauconite and chromite in Rohtas and Gaya.

Best Practices adopted by Bihar

Thematic Area: Technology, research and development

1 Geo-fencing of mineral lease areas to prevent illegal mining in mining areas

Geo-fencing of mineral lease areas in Bihar is being implemented as part of broader efforts to combat illegal mining, particularly in the context of the state's new mining policies.

- **Highlights:**
  - The Bihar Minerals (Concession, Prevention of Illegal Mining, Transportation & Storage) Rules, 2019, outline the legal basis for these measures. This framework includes provisions for digitizing mining plans and implementing geo-fencing as a critical tool to curb illegal activities
  - The Mines and Geology Department is tasked with tracking vehicles involved in sand transportation through GPS technology. This initiative complements geo-fencing by ensuring that only pre-registered vehicles operate within the mining areas, thus enhancing oversight
- **Outcomes :**
  - The implementation of geo-fencing in mining areas is expected to produce transformative outcomes across multiple dimensions
  - Geo-fencing offers a holistic solution to the challenges posed by illegal mining . By leveraging technology for real-time monitoring, data integration, and enforcement, the state can achieve significant improvements in revenue collection, environmental protection, and stakeholder confidence.

Source: State Ministry information received and secondary research

2 Weighbridge and CCTV camera integrated with NIC and VAHAN portal at mineral dispatch sites

The integration aims to create a comprehensive surveillance and data management system that ensures transparency and accountability in mineral dispatch operations. This system will help prevent illegal mining and ensure that all transactions are accurately recorded.

- **Highlights:**
- Each sandghat may have an electronic weigh-bridge, integrated with central server. However for adjacent sandghats, department may allow use of common weighbridge. Any vehicle found carrying sand without proper weighment slip/ e-challan shall be liable to be seized under the provisions of the Mines and Minerals (Development and Regulation) Act, 1957 or the rules made there under.

- **Outcomes :**
  - These measures significantly reduce illegal mining and mineral transportation, enhance government revenue by eliminating underreporting, and ensure compliance with environmental and legal standards.

3 Real Time Monitoring of GPS equipped vehicles transporting minerals through VLTS (Vehicle Location Tracking System) to prevent illegal transportation

The VLTS is designed to provide continuous tracking of vehicles involved in mineral transportation, ensuring compliance with legal regulations and minimizing the risk of illegal mining activities. This system enhances transparency and accountability in the transportation process.

- **Highlights:**
- The VLTS will be integrated with the software named Khanansoft, developed with the assistance of the National Informatics Centre (NIC). This software will facilitate real-time monitoring of all sand mining activities, including vehicle movements and dispatches, thereby streamlining operations and increasing revenue collection for the state
- By integrating with the mParivahan portal, the system ensures that vehicle details are verified before transportation begins. This integration enhances the reliability of data collected and aids in issuing necessary permits or challans.

- **Outcomes :**
  - The implementation of real-time monitoring through the Vehicle Location Tracking System (VLTS) for GPS-equipped vehicles transporting minerals will significantly enhance governance, transparency, and efficiency in the mining sector
  - By enabling continuous tracking of vehicle locations and integrating data with NIC and VAHAN portals, the system ensures compliance with approved routes and prevents unauthorized transportation

4 Establishment of Integrated Control and Command Center at department level and 24x7 Helpline Number

The Integrated Control and Command Center will serve as a centralized hub for monitoring all mining operations within the state. This facility aims to improve coordination among various stakeholders, streamline operations, and enhance regulatory compliance.

- **Highlights:**
- The center will utilize advanced technologies, including real-time data tracking from the Vehicle Location Tracking System (VLTS) and other monitoring tools. This integration will allow officials to oversee vehicle movements, verify compliance with regulations, and respond swiftly to any illegal activities detected

- **Outcomes :**
  - Real-time monitoring and centralized data integration will enhance enforcement capabilities, curbing illegal mining and unauthorized transportation of minerals.
  - The helpline provides an accessible platform for stakeholders to report grievances or violations, improving responsiveness and transparency

5 Colour code for identification of vehicles transporting minerals

The colour coding system is designed to facilitate the easy identification of vehicles involved in mineral transportation. This measure aims to prevent unauthorized transport and ensure compliance with mining regulations.

- **Highlights:**
- Vehicles used for transporting minerals must adhere to designated colour codes. Additionally, the sand being transported must be dry and covered with a sheet of the specified colour. This requirement helps in distinguishing legal transport operations from illegal ones
- Vehicles that do not comply with the specified colour codes will face penalties.

- **Outcomes :**
  - The colour-coding system will simplify the identification of authorized vehicles, reducing the chances of illegal mineral transportation. Enforcement agencies will be able to monitor compliance more effectively, enhancing transparency and accountability

Thematic Area: Mineral administration

6 Rewards for intelligence and action on illegal mining and transportation of minor mineral

The Bihar government has implemented a reward system to encourage citizens to report illegal mining and transportation of minor minerals..

- **Highlights:**
- Individuals providing information about illegal mining activities will receive financial rewards. Specifically:
- ₹5,000 for reporting illegal activities involving tractors.
- ₹10,000 for reporting larger vehicles, such as trucks, involved in illegal mineral transportation

- **Outcomes :**
  - These incentives and rewards will encourage individuals, enforcement agencies, communities, and organizations to actively participate in the prevention of illegal mining and transportation, and incentivize proactive and effective measures that contribute to the state's sustainable development
  - Government rewarded 24 people for providing inputs about sand mafias and illegal mining

7 District Mining Task Force for monitoring of Illegal mining of Sand

The establishment of a District Mining Task Force in Bihar is a strategic initiative aimed at monitoring and preventing illegal mining activities

- **Highlights:**
- The task force is responsible for coordinating efforts to combat illegal mining, ensuring compliance with mining regulations, and implementing effective monitoring strategies.
- The task force also aims to engage with local communities to raise awareness about the legalities of mining and encourage reporting of illegal activities..

- **Outcomes :**
  - The establishment of a District Mining Task Force to monitor and combat illegal sand mining will serve as a strategic initiative to curb illegal extraction, improve resource management, and ensure sustainable mining practices.
  - The task force will operate at the district level, bringing together key stakeholders to monitor, investigate, and enforce laws related to sand mining. This approach aims to decentralize the enforcement process, ensuring more effective and localized control over illegal sand mining activities

Summary of Initiatives & Recommendations - Bihar (1/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Bihar						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1.	Geo-fencing of mineral lease areas to prevent illegal mining in mining areas	The implementation of geo-fencing in mining areas is expected to produce transformative outcomes across multiple dimensions Geo-fencing offers a holistic solution to the challenges posed by illegal mining . By leveraging technology for real-time monitoring, data integration, and enforcement, the state can achieve significant improvements in revenue collection, environmental protection, and stakeholder confidence.
2.	Weighbridge and CCTV camera integrated with NIC and VAHAN portal at mineral dispatch sites	The integration of weighbridges and CCTV cameras with NIC and VAHAN portals at mineral dispatch sites will revolutionize the mining sector by ensuring transparency, compliance, and efficiency These measures significantly reduce illegal mining and mineral transportation, enhance government revenue by eliminating underreporting, and ensure compliance with environmental and legal standards.
3.	Real Time Monitoring of GPS equipped vehicles transporting minerals through VLTS (Vehicle Location Tracking System) to prevent illegal transportation	The implementation of real-time monitoring through the Vehicle Location Tracking System (VLTS) for GPS-equipped vehicles transporting minerals will significantly enhance governance, transparency, and efficiency in the mining sector By enabling continuous tracking of vehicle locations and integrating data with NIC and VAHAN portals, the system ensures compliance with approved routes and prevents unauthorized transportation
4.	Establishment of Integrated Control and Command Center at department level and 24x7 Helpline Number	Real-time monitoring and centralized data integration will enhance enforcement capabilities, curbing illegal mining and unauthorized transportation of minerals. The helpline provides an accessible platform for stakeholders to report grievances or violations, improving responsiveness and transparency.
5.	Colour code for identification of vehicles transporting minerals	The colour-coding system will simplify the identification of authorized vehicles, reducing the chances of illegal mineral transportation. Enforcement agencies will be able to monitor compliance more effectively, enhancing transparency and accountability
6.	Rewards for intelligence and action on illegal mining and transportation of minor minerals	The establishment of Rewards for Intelligence and Action on Illegal Mining and Transportation of Minor Minerals will serve as a recognition mechanism for exceptional efforts in combating illegal activities in the mining sector. These incentives and rewards will encourage individuals, enforcement agencies, communities, and organizations to actively participate in the prevention of illegal mining and transportation, and incentivize proactive and effective measures that contribute to the state's sustainable development
7.	District Mining Task Force for monitoring of Illegal mining of Sand	The establishment of a District Mining Task Force to monitor and combat illegal sand mining will serve as a strategic initiative to curb illegal extraction, improve resource management, and ensure sustainable mining practices. The task force will operate at the district level, bringing together key stakeholders to monitor, investigate, and enforce laws related to sand mining. This approach aims to decentralize the enforcement process, ensuring more effective and localized control over illegal sand mining activities

Summary of Initiatives & Recommendations - Bihar (2/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Bihar						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Mineral Administration and Mineral Concession	▪ Other states have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	▪ Other states have been actively pursuing initiatives such as ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Sustainable Mining Practices	▪ Other states have adopted ▪ M-Sand Policy ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development
Technology, research and development	▪ Other states have adopted other initiatives ▪ Mine Surveillance system ▪ Drone Survey of Quarries ▪ Sand Mine Portal ▪ These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.
Social project implementation	▪ Other states have adopted other initiatives: ▪ DMF Portal ▪ Mines and Mineral Restoration and Rehabilitation Fund ▪ Upgradation of Healthcare services ▪ These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .
Mine closure, waste management , reclamation and rehabilitation	▪ Other states have adopted the initiatives such ▪ Management of Abandoned mines ▪ Dumping of Overburden and waste outside the lease area for Minor minerals ▪ These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.
Skilling and Capacity Building	▪ Other states have adopted the initiatives such ▪ Human Resource Development ▪ This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

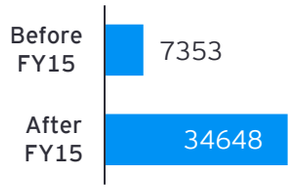
For more information, visit the following website: *Mines & Geology Department*

5.4 State-wise initiatives and outcomes

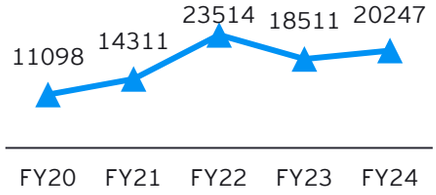
4. Chhattisgarh

KPIs so far....

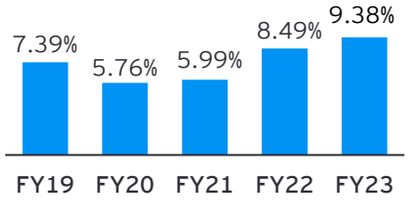
(Revenue Pre & Post Auction), INR Cr



Value of mineral production, INR Cr



Mining contribution (%) to State GDP



Chhattisgarh Mineral Scenario

- Chhattisgarh is one of India's most mineral-rich states, playing a vital role in the nation's mining sector. Located in central India, the state is home to vast reserves of coal, iron ore, limestone, bauxite, dolomite, and other minerals.
- With its abundance of coal and other mineral deposits, the state is integral to India's power generation and steel production sectors.
- Coal mining has been a key driver of Chhattisgarh's economic expansion, with the state housing some of the largest coal reserves in the country, especially in the Korba and Hasdeo-Arand regions
- Apart from coal, Chhattisgarh's mineral sector is also dominated by substantial deposits of iron ore, bauxite, limestone, and dolomite, which serve crucial industries like steel, cement, and aluminum production.
- The iron ore reserves in the Bastar and Durg regions are vital for both domestic consumption and export, while the state's bauxite deposits play a pivotal role in supporting the aluminum industry

What's going on so far...

- State government has focused on creating policies aimed at sustainable mining practices and improving community welfare. Programs such as the District Mineral Foundation (DMF) and e-auctioning of mineral blocks are key to ensuring that the benefits of mining extend to local populations while ensuring transparency and sustainability in resource extraction.
- As Chhattisgarh continues to harness its mineral wealth, the state remains a crucial contributor to India's economic growth, particularly in the energy, steel, and cement industries, while striving to balance economic development with environmental sustainability.

Best Practices adopted by Chhattisgarh

1 **Thematic areas - Mineral administration**

Khanij Online

The Khanij Online Portal launched by the Chhattisgarh Government in 2017 is an integrated digital platform designed to streamline and modernize the management of mines and minerals in the state. It is as Web based Integrated Mines and Minerals Management system used for effective administration and regulation of mineral resources in the state of Chhattisgarh. The portal helps regulate and monitor the mining process, starting from the issuance of mining licenses to the tracking of mineral-loaded vehicles. It serves as a one-stop platform for stakeholders such as mining leaseholders, transporters, and government authorities, offering services like

I. **E-Transit Pass:** Miners can generate electronic transit passes for mineral transportation, reducing paperwork and improving tracking

II. **Online Royalty and Payment System:** The portal facilitates easy payment of royalty, District Mineral Foundation (DMF) fees, and other necessary dues related to mining operations.

III. **Monitoring Tools:** Integration with GPS tracking for mineral-loaded vehicles and the use of high-tech surveillance ensures the government to monitor mining and transport activities in real-time. This helps curb illegal mining and unauthorized transportation.

- **Highlights:**
  - Auto Approval based dispatch provision using digital signature (e-Permit)
  - Single Click Online Payment of Royalty, DMF, NMET and transfer of amount in respective accounts/heads in T+1 DAY
  - Real Time Assessment with automatic generation of Demand/Credit note (e-Wallet)
- **Outcomes :**
  - In 2019, Khanij Online received the National e-Governance Silver Award for Excellence in Government Process Re-engineering for Digital Transformation.
  - The Khanij Online portal has facilitated issuance of 10,653 ePermits in current financial year as on 06.01.2025

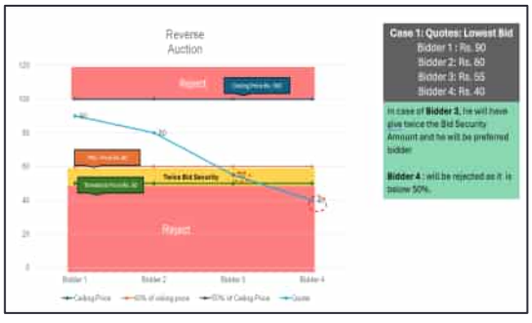
Source: State Ministry information received and secondary research

2 Allocation of Sand Mines on Reverse Auction mode

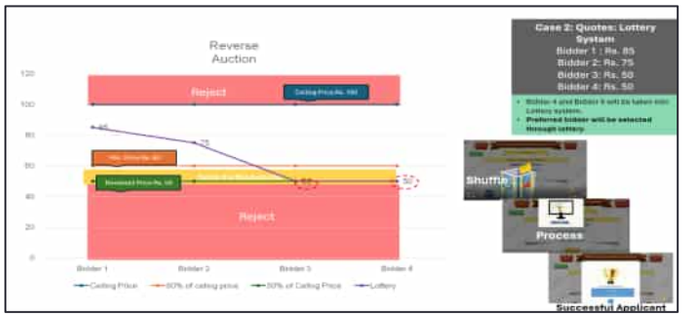
Under this system, sand mines are auctioned to private contractors or companies through an online reverse auction platform

- **Features and Highlights**
  - A District Level Committee establishes a ceiling price for sand mines per cubic meter of sand. Bidders then submit reverse bids that are lower than this ceiling price, with no bid being acceptable if it is below 50% of the ceiling price
  - The bidder quoting the lowest bid is the preferred bidder. If there are multiple bids at the minimum 50% of the ceiling price, the successful bidder is chosen through a lottery system
  - In each district, only one bidder is selected for a single or cluster of sand mines. A maximum of five mines can be allocated to a single entity across the entire state
- **Outcomes**
  - The introduction of a reverse auction mechanism for the allocation of sand mines has significantly improved transparency, price control, and prevented monopolies in the sand mining sector in Chhattisgarh.
  - By allowing bidders to compete in an open and competitive environment, this process ensures fair pricing and optimal resource utilization.
  - The reverse auction method has also minimized illegal sand mining activities and enhanced regulatory oversight.

Snapshot for allocation in Chhattisgarh- Lowest Bid



Snapshot for allocation in Chhattisgarh- Lottery



3 Pre-embedded clearances

The implementation of pre-embedded clearances in Chhattisgarh's mining sector is part of a broader initiative by the Indian government aimed at streamlining the process for mineral block allotments. This approach is designed to enhance the Ease of Doing Business by ensuring that all necessary environmental and regulatory approvals are obtained before the auctioning of mining blocks

- **Features and Highlights**
  - Pre-embedded clearances refer to the advance acquisition of all required permissions from various departments—such as Environment, Forests, and Pollution Control—before a mining block is auctioned. This system aims to reduce delays that previously burdened project proponents, who had to individually approach multiple departments for clearances, often leading to significant time lags in project initiation
- **Outcomes**
  - Department has taken 05 bauxite blocks for allotment through e-Auction under preembedded clearance mode. Mining Plan has been approved in all the cases, whereas Environment Clearance is at Public Hearing stage. The same is taken up through CMDC. However, department is also in process of empaneling agencies for Mining Plan, Environment Clearance & Forest Clearance.

4 Post Auction Facilitation Cell

Department has dedicated Mineral Auction Cell which timely reviews the status of different clearance viz Mining Plan, Environment Clearance, Forest Clearance and other statutory required clearances with respect to early operationalization of auction blocks. Further a high level committee under the chairmanship of Chief Secretary "Mining Project Co-ordination Committee" is also in place to review and provide necessary Post Auction handholding

5 Collaboration with PSU for Exploration

Department through Chhattisgarh Mineral Development Corporation (CMDC) has signed an Memorandum of Understanding (MoU) with MOIL Ltd in January, 2023 to explore manganese and associated minerals in the State. MOIL started exploration activities in June 2024 and has successful in discovery of a potential deposit of Manganese in Balrampur District, which is first of its kind in Chhattisgarh.

Thematic Area: Sustainable Mining Practices

6 Star Rating of Minor Minerals

The Star Rating of Minor Minerals in Chhattisgarh is a progressive initiative aimed at promoting transparency, enhancing compliance, and encouraging sustainable mining practices. The system rates mines based on criteria that assess the environmental, operational, and safety standards of mining activities.

Mines with an area > 4 Ha are considered for Star Rating of 31 Minor Minerals

- **Features and Highlights**
  - Mining lessees conduct a self-assessment based on the criteria provided in the user manual.
  - Independent agencies verify the self-assessment reports to ensure accuracy and compliance.
  - Based on the evaluation, mining operations are assigned a star rating, with higher ratings indicating better performance in sustainable practices

- **Outcomes**
  - The system promotes transparency in mining operations and holds companies accountable for their environmental and social impact.
  - FY 2020-21 total 45 small minor mineral leases in the State were rated out of which 08 mines got 5 Star, 21 mines were rated 4 and 16 mines got 3 star.

MODULE WISE PRESCRIBED MARKS

Module	Module Name	Sum of Applicable Maximum Points in all Modules (a)
Module 1	SYSTAMATIC AND SUSTAINABLE MINING	30
Module 2	PROTECTION OF ENVIRONMENT AND CONSERVATION OF WATER	25
Module 3	HEALTH SAFETY AND WELFARE OF WORKERS	15
Module 4	STATUTORY COMPLIANCE	30
Total		100

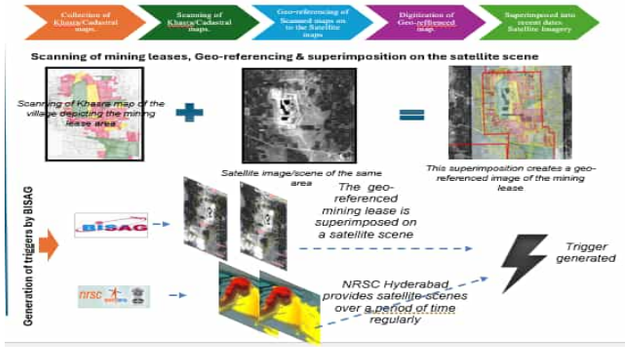
Thematic Area: Technology, research and development

7 Mine Surveillance System(MSS)

Chhattisgarh has implemented a comprehensive Mine Surveillance System to detect and curb illegal mining activities. If unusual activity is detected, the system generates triggers, which are forwarded to the state authorities for further verification through on-ground visits.

- **Features and Highlights**
  - This system uses satellite imagery to monitor mining regions, with a focus on areas within 500 meters of existing mining leases.
  - The system has been implemented across many states in India
  - The total numbers of mining leases plotted in the MSS are 3405

- **Outcomes**
  - In the first phase, 45 quarry leases of minor minerals were brought upon MSS. Whereby 38 triggers generated. After field verification, illegal mining against 08 triggers were not found in the field.
  - In the rest of the cases field verification underway. For the second phase, approx. 55 quarry lease has been taken up. Digitisation and georeferencing of cadastral data is under process by CGCOST

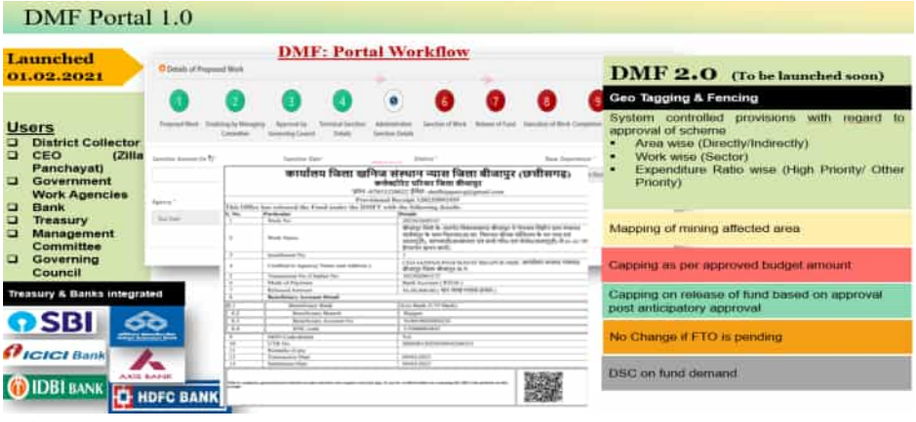


Thematic Area: Social Project Implementation

8 DMF Portal

The District Mineral Foundation (DMF) Portal in Chhattisgarh is a digital platform designed to manage and monitor activities related to DMF Trusts. DMFs are established under the Mines and Minerals (Development and Regulation) Amendment Act, 2015, to benefit communities and areas affected by mining activities. The portal centralizes information, ensuring greater transparency, accountability, and efficient fund utilization

- **Features and Highlights**
  - Comprehensive Fund Management - Ensures funds are directed to priority areas, especially the most affected regions
    - Tracks the collection and allocation of DMF funds.
    - Displays financial information, including fund disbursals for various developmental project
  - Real Time Monitoring -Provides updates on project progress across sectors like education, healthcare, and infrastructure.
  - Visual dashboards and reports show fund distribution across districts and sectors
- **Outcomes**
  - Till Nov. 2024, there has been total Collection of Rs. 14,371.13 Cr. under DMFTs in the State.
  - Against which 96,226 projects have been sanctioned with an estimated amount of Rs. 14,843.57 Cr.
  - 65,316 of projects have been completed with the total expenditure Rs. 10680.30 Cr.
  - The online portal has brought transparency and time efficiency in scrutiny, sanction and fund transfer for the projects under DMFTs.



9 Development of Infrastructure

New rail projects for infrastructure development for mineral evacuation.

- **Features and Highlights**
  - Work is going on in Chhattisgarh on 25 new rail line projects of 2,731 km at a cost of Rs 37,018 crore.
  - The proposed two new rail line projects in coal and iron-rich areas of Chhattisgarh will facilitate speedy transportation of minerals from the state's northern and southern region to different parts of the country
  - The Ministry of Railway has approved a substantial financial allocation of Rs 16.75 crore – Rs 12.25 crore for the Gadchiroli to Bacheli (via Bijapur) line and Rs 4.50 crore for the Korba to Ambikapur line – for the final survey and Detailed Project Reports (DPRs)
- **Outcomes**
  - East-West and East Rail Corridor covering distance of 170 km and 133 km respectively in the North-East Coal bearing areas of the State is in progress with the contribution from MDF
  - The 180-km Korba to Ambikapur rail line is being constructed with the aim of connecting rich coal reserves, while the 490-km Gadchiroli to Bacheli line is being developed with the aim of establishing better rail connectivity. Kharsia-New Raipur-Parmalkasa new railway line project. is 277 Km long will provide an alternative route for the evacuation of coal form, SECL and MCL coalfields to the western region of the country

10 Allocation of minor minerals through e-auction

Chhattisgarh has pioneered the e-auction process for minor minerals in India, becoming the first state to implement this system

- **Features and Highlights**
  - The process involves a two-tier forward-bidding mechanism, bidders submit offers electronically. This method ensures transparency & competitiveness in mineral resource allocation
  - The state government auctioned the Bharda dolomite mine located in Bilaspur district through the e-auction route
- **Outcomes**
  - As against the reserve price of Rs 15 per tonne, the bidders quoted highest price of Rs 154 per tonne.
  - The state exchequer would get Rs 18 crore as auction money. Besides royalty of Rs 9 crore, the mine would contribute Rs 90 lakh to the district mineral fund (DMF)

11 Land bank for compensatory afforestation AND MDF (Mineral Development Fund)

The primary aim of the Land Bank is to compensate for the loss of forest cover due to projects that require land diversion. When forest land is diverted for industrial or developmental purposes, an equal area of land is required to be afforested to maintain ecological balance

The State has constituted "Mineral Development Fund" under Chhattisgarh Mineral Development Fund Act, 2003 with an objective of mineral sector development and restoration of ecological system. Every year an amount equal to 5% of mineral revenues collected during the preceding financial year is earmarked and contributed to the fund. MDF have been an enabler to propelling mining sector in the state of Chhattisgarh.

Summary of Initiatives & Recommendations - Chhattisgarh (1/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Chhattisgarh						

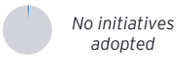
 No initiatives adopted
 *0-25% initiatives adopted*
 *25-50% initiatives adopted*
 *50-75% initiatives adopted*
 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1	Khanij Online	▪ In 2019, Khanij Online received the National e-Governance Silver Award for Excellence in Government Process Re-engineering for Digital Transformation ▪ The portal has facilitated the issuance of 10,033 e-permits for mineral transit
2	Allocation of Sand Mines on Reverse Auction mode	▪ The introduction of a reverse auction mechanism for the allocation of sand mines has significantly improved transparency, price control, and prevented monopolies in the sand mining sector in Chhattisgarh. ▪ By allowing bidders to compete in an open and competitive environment, this process ensures fair pricing and optimal resource utilization.
3	Pre-embedded clearances	▪ Department has taken 05 bauxite blocks for allotment through e-Auction under pre-embedded clearance mode. Mining Plan has been approved in all the cases, whereas Environment Clearance is at Public Hearing stage. The same is taken up through CMDC. However, department is also in process of empanelling agencies for Mining Plan, Environment Clearance & Forest Clearance.
4	Post Auction Facilitation Cell	▪ Department has dedicated Mineral Auction Cell which timely reviews the status of different clearance viz Mining Plan, Environment Clearance, Forest Clearance and other statutory required clearances with respect to early operationalization of auction blocks. Further a high level committee under the chairmanship of Chief Secretary "Mining Project Co-ordination Committee" is also in place to review and provide necessary Post Auction handholding.
5	Star Rating of Minor Minerals	▪ The system promotes transparency in mining operations and holds companies accountable for their environmental and social impact. ▪ In FY-23, total 380 mines were rated out of which 43 got 5 star rating and 100 got 4 star rating.
6	Collaboration with PSU for Exploration	▪ Department through Chhattisgarh Mineral Development Corporation (CMDC) has signed an Memorandum of Understanding (MoU) with MOIL Ltd in January, 2023 to explore manganese and associated minerals in the State. MOIL started exploration activities in June 2024 and has successful in discovery of a potential deposit of Manganese in Balrampur District, which is first of its kind in Chhattisgarh.
7	Mine Surveillance System	▪ In the initial phase 296 triggers were generated in which 47 instances of illegal mining were detected highest in Goa and Gujrat at 12 instances each. In phase 4 (2022-23) 157 triggers were generated .
8	DMF Portal	▪ As of 2023, the DMF in Chhattisgarh has collected over ₹6,000 crores, nearly ₹600 crores have been used to ensure clean drinking water Over ₹1,200 crores have been allocated to healthcare projects, including the construction of hospitals and mobile medical units Around ₹800 crores have been invested in educational initiatives, such as building schools and providing scholarships
9	Development of Infrastructure	▪ The 180-km Korba to Ambikapur rail line is being constructed with the aim of connecting rich coal reserves, while the 490-km Gadchiroli to Bacheli line is being developed with the aim of establishing better rail connectivity of the state with Maharashtra and border areas of Andhra Pradesh, Telangana and Odisha. ▪ Kharsia-New Raipur-Parmalkasa new railway line project. is 277 Km long will provide an alternative route for the evacuation of and provides connectivity to cement Rich region of Baloda Bazar
10	Allocation of minor minerals through e-auction	▪ The state government auctioned the Bharda dolomite mine located in Bilaspur district through the e-auction route
11	Land bank for compensatory afforestation	▪ The primary aim of the Land Bank is to compensate for the loss of forest cover due to projects that require land diversion. When forest land is diverted for industrial or developmental purposes, an equal area of land is required to be afforested to maintain ecological balance

Summary of Initiatives & Recommendations - Chhattisgarh (2/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Chhattisgarh						



Recommendation

Mineral Administration and Mineral Concession	▪ Other states have adopted other initiatives: ▪ Issuance of lease for minor minerals on double royalty
Exploration and Mines development	▪ Other states have been actively pursuing initiatives: ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Sustainable Mining Practices	▪ Other states have adopted other initiatives: ▪ M-Sand Policy ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development
Technology, research and development	▪ Other states have adopted other initiatives: ▪ Drone Survey of Quarries ▪ E-Check gate implementation ▪ Sand Mine Portal ▪ These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.
Social project implementation	▪ Other states have adopted other initiatives: ▪ Mines and Mineral Restoration and Rehabilitation Fund ▪ Upgradation of Healthcare services ▪ These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .
Mine closure, waste management , reclamation and rehabilitation	▪ Other states have adopted the initiatives: ▪ Management of Abandoned mines ▪ Dumping of Overburden and waste outside the lease area for Minor minerals ▪ These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.
Skilling and Capacity Building	▪ Other states have adopted the initiatives: ▪ Human Resource Development ▪ This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

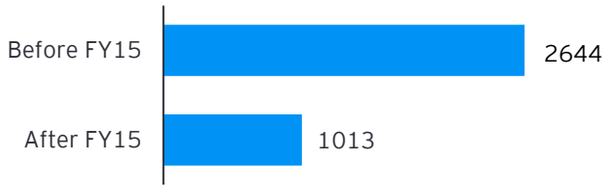
For more information, visit the following website: chhattisgarhmines.gov.in

5.4 State-wise initiatives and outcomes

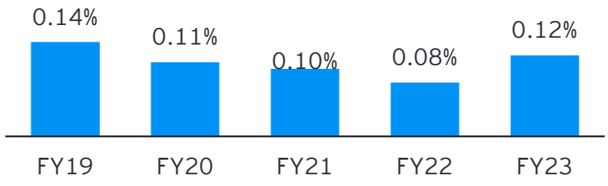
5. Goa

KPIs so far....

(Revenue Pre & Post Auction), INR Cr



Mining contribution (%) to State GDP



Note: The mines were closed in Goa for a number of years.

Goa Mineral Scenario

- Goa, one of India's smallest states, is endowed with a rich mineral base, contributing significantly to the state's economic development and export earnings. The mining sector in Goa has historically been the backbone of its industrial landscape, with operations dating back several decades. Among all minerals, iron ore dominates in terms of production and economic value, making Goa a major player in India's mineral export economy.
- The state's mineral wealth has shaped its economic profile, fostering job creation, foreign exchange earnings, and infrastructural development. However, the sector has also been a focal point of debates concerning environmental degradation, ecological sustainability, and regulatory challenges. In recent years, efforts have been directed toward balancing economic benefits with responsible mining practices to ensure long-term sustainability

What's going on so far...

- 20 companies from other states participated in the pre-bid conference for the sale of three mining leases under the phase III auction of iron ore mineral blocks being conducted in the state. The three mineral blocks have total iron ore mineral resources of 63.4 million tonne (MT) and dump resources of 3.3 MT
- Goa's mining industry kick-started operations on April 4, after a six-year shutdown, with Vedanta Sesa Goa beginningfresh extraction of ore at the Bicholim mineral block.
- The Bauxite Mines are situated in South Goa over an area of 1263.678 HA. with estimated reserves of 70 million tons. These are metallurgical grade bauxite which can also be used for various applications such as cement, alumina chemicals, etc. The mines are situated also in the close proximity of two major ports, viz. Marmugoa Port and Betul Port

Best Practices adopted by Goa

Thematic Area: Mineral Administration

1 Ore Tracking System

The system tracks production of mineral orc at the mining leases and provides for online payment of Royalty, DMF, GIOPF, NMET contributions. The system also enables proper stock management by the lessee, trader/organizations. For this purpose, weighbridges are installed at the mining leases/source and at the destinations. The system provides for online issuance of transit, sale and export permits.

Highlights:

- Real-Time Tracking - Integration of GPS technology to monitor the movement of ore-laden trucks in real-time
- E-Permit system - Introduction of QR-code-based e-permits for all transportation vehicles. Permits are generated online and linked to specific mining leases and production data
- Production Monitoring - Tracks ore production at mining sites to ensure it aligns with approved mining plans.

Outcomes :

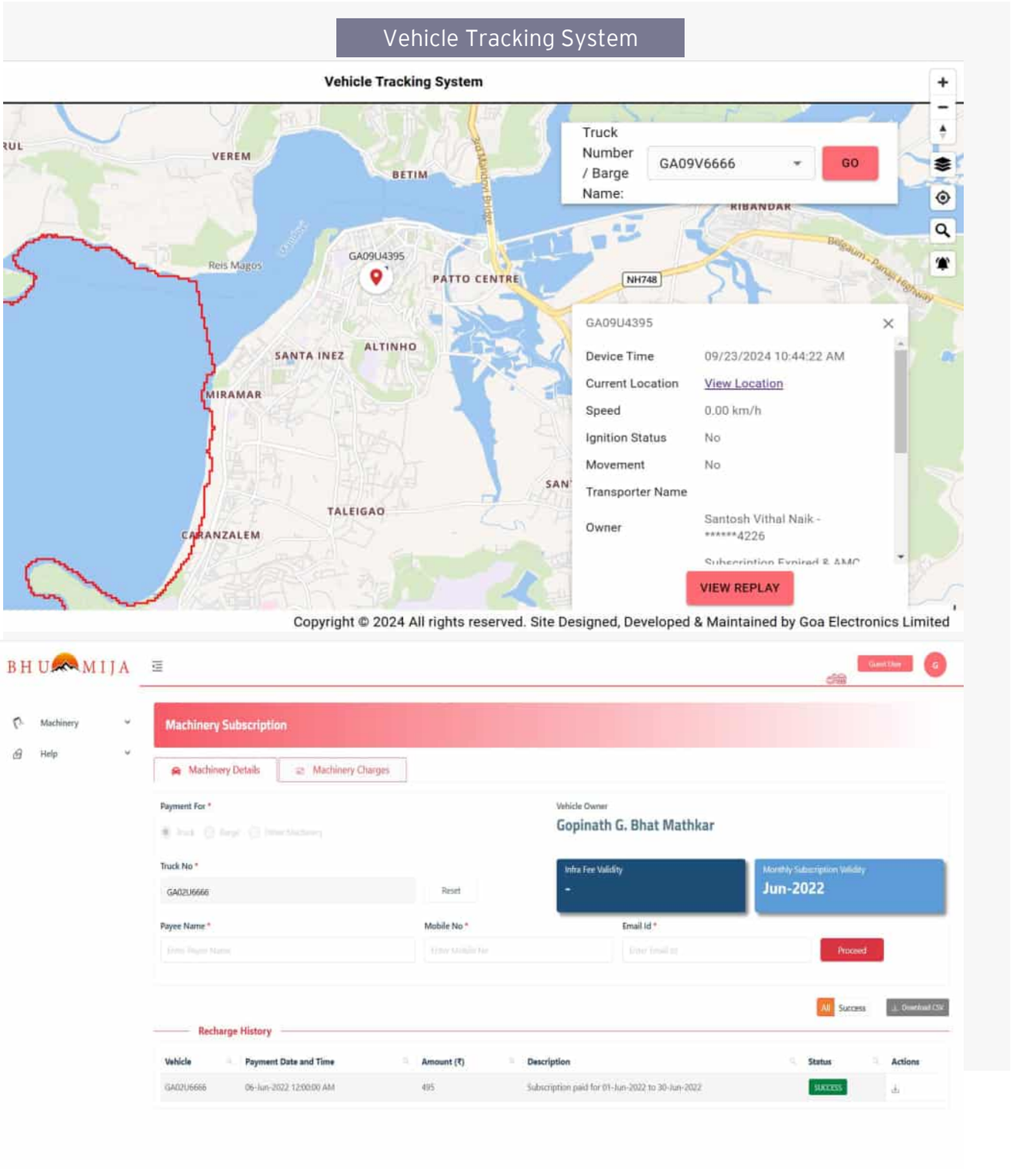
- Tracking ensures that ore is transported only along authorized routes and destinations
- Production monitoring prevents unauthorized extraction and minimizes discrepancies in production data
- The E-permit system significantly cuts down on processing time for permits, allowing miners to commence operations more quickly and remotely.

Source: State Ministry information received and secondary research

2 Vehicle Tracking System

The VTS facilitates efficient planning and tracking of ore carrying vehicles/barges. All mineral carrying vehicles/barges arc fitted with GPS and arc subject to live tracking

- **Features and Highlights of the system:**
  - Under this system mines department officials sitting in the office can monitor movement of each truck and the amount of ore it carries from the mines to the jetty.
- **Outcomes**
  - Live status of vehicles, vehicle status, and owner details are available in real time, it also contains the subscription details
  - Services like Online payment of vehicle subscription, validity and recharge history available on Bhumija portal



Summary of Initiatives & Recommendations - Goa (1/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Goa						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1	**Ore Tracking System**	• Tracking ensures that ore is transported only along authorized routes and destinations • Production monitoring prevents unauthorized extraction and minimizes discrepancies in production data • The E-permit system significantly cuts down on processing time for permits, allowing miners to commence operations more quickly and remotely.
2	**Vehicle Tracking System**	• Live status of vehicles, vehicle status, and owner details are available in real time, it also contains the subscription details • Services like Online payment of vehicle subscription, validity and recharge history available on Bhumija portal

Recommendation

Mineral Administration and Mineral Concession	▪ Other states have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	▪ Other states have been actively pursuing initiatives: ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Sustainable Mining Practices	▪ Other states have adopted other initiatives: ▪ M-Sand Policy ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development
Technology, research and development	▪ Other states have adopted other initiatives: ▪ Mine Surveillance system ▪ Drone Survey of Quarries ▪ E-Check gate implementation ▪ Sand Mine Portal ▪ These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.
Social project implementation	▪ Other states have adopted other initiatives: ▪ DMF Portal ▪ Mines and Mineral Restoration and Rehabilitation Fund ▪ Upgradation of Healthcare services ▪ These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Summary of Initiatives & Recommendations - Goa (2/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Goa						

Recommendation

Mine closure, waste management , reclamation and rehabilitation	▪ Other states have adopted the initiatives: ▪ Management of Abandoned mines ▪ Dumping of Overburden and waste outside the lease area for Minor minerals ▪ These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.
Skilling and Capacity Building	▪ Other states have adopted the initiatives: ▪ Human Resource Development ▪ This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

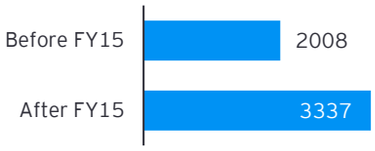
For more information, visit the following website: Directorate of Mines & Geology

5.4 State-wise initiatives and outcomes

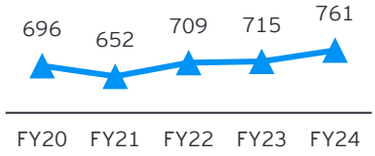
6. Gujarat

KPIs so far....

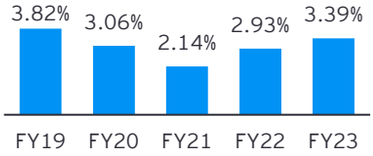
(Revenue Pre & Post Auction), INR Cr



Value of mineral production, INR Cr



Mining contribution (%) to State GDP



Gujrat Mineral Scenario

- Gujarat has a rich mining history, with a diverse mineral portfolio contributing significantly to its industrial economy. The state is a key player in the extraction of various minerals, such as lignite, bauxite, limestone, fluorspar, and manganese, with the Gujarat Mineral Development Corporation (GMDC) playing a central role in these activities. GMDC has been instrumental in harnessing these resources, particularly lignite and bauxite, which support key industries like power generation, cement, and aluminum production.
- The corporation is also exploring the potential of rare minerals like graphite, although some exploration projects, such as those in the Dahod region, have not yet yielded substantial results
- The geological diversity of Gujarat contributes significantly to its mineral wealth, featuring sedimentary basins rich in hydrocarbons like petroleum and natural gas found in Kutch and Saurashtra. The volcanic regions of the Deccan Traps provide minerals such as bauxite and manganese, while metamorphic belts in the Aravalli Range contain various minerals including copper and lead.

What's going on so far...

- In recent years, Gujarat has been engaged in expanding its mineral exploration to identify new sources of critical and strategic minerals. Though the state's efforts in graphite and rare earth elements have not yet been fruitful, ongoing projects show a commitment to exploring new mineral potential
- Furthermore, Gujarat's mining policies focus on enhancing technological integration and improving infrastructure to ensure that the benefits of mining extend to local communities through employment generation, skill development, and better access to mining-related services.
- The state is actively working to ensure that the benefits of mining are equitably distributed, with a focus on sustainable development that balances industrial growth and environmental conservation

Best Practices adopted by Gujarat

Thematic Area: Mineral Administration

1 **Integrated Lease Management System 2.0**

The Integrated Lease Management System 2.0 (ILMS 2.0) implemented by the Gujarat Government is a modernized platform designed to digitize and streamline the end-to-end management of mineral leases. Received National Award for Exemplary Implementation of eGovernance Initiatives 2012-13 by Department of Administrative Reforms and Public Grievances, Govt. of India for "MAGIC – (Mineral Administration and Governance Using ICT)"

Highlights:

- Conversion of physical processes to online like on-boarding of concession holders / End Users and operational processes like approval of mining plan, transfer /surrender/ closure of concession etc.
- Standardised templates for certificates & documents like LoI, Grant Order, Lease deed etc.
- Digital documents repository & Digitally signed certificates using DSC key
- System generated alerts that will help users to make timely decisions.
- Wallet (Royalty, Premium, TCS, DMF) based integrated payment system

Outcomes:

- Approx. 1500 financials transactions worth of more than Rs.4 crores are being managed daily.
- Growth in revenue generation and timely payment due system checks and alerts, Interlinked revenue (DMF, TCS, etc.)
- More than 60,000 transit pass generation daily.
- Generation of Periodic pre-defined and customized MIS reports leads to revenue planning and budgeting.
- Faster Service Delivery, Real time accounting and receipt generation .
- Proactive actions and quick decision/approval due to System alerts

Source: State Ministry information received and secondary research

2. Pre-Embedded Clearance under PMU

The introduction of pre-embedded clearances for mining projects in Gujarat, as part of a broader initiative by the Indian government, aims to streamline the auction and operationalization process of mineral blocks. This approach is designed to address delays in obtaining necessary approvals, thereby enhancing the efficiency of mining operations.

A total of 11 mineral bearing blocks (10 govt. land and 1 pvt. Land) containing major minerals have been identified. DGPS surveys have been completed for all these blocks, and revenue opinions in some of the blocks have been obtained. Mining plan for the Chhattar Limestone Block (10.30.92 Ha) in Jamnagar District was submitted by the CGM and subsequently approved by the Indian Bureau of Mines (IBM).In the process of securing environmental clearance.

Features and Highlights of the system:

- A dedicated PMU has been established to handle all preparatory work required for obtaining clearances.
- This includes environmental and forest permissions, which are traditionally time-consuming.
- The PMU will also prepare the mining plan, which must be approved by the Indian Bureau of Mines (IBM) within 15 days
- Historically, the clearance process has taken an average of 270 days for environmental clearances and up to 530 days for forest clearances

Outcomes

- The fees for obtaining these clearances shall be initially borne by the state government and subsequently recouped from the successful bidder.
- By securing clearances beforehand, the initiative aims to significantly cut down on the time it takes for mining companies to begin operations after winning an auction.

3. Issuance of leases on double royalty for Minor Minerals

Routes for issuance of lease has been adopted – Double Royalty and Online Auction. Leases of area upto 4 ha. of private land are granted without the auction route and lessee has to pay double the royalty. This approach aims to ensure that the state receives a fair share of revenue from mineral extraction while discouraging illegal mining activities.

Features and Highlights of the system:

- Under the Double Royalty system, the government charges a higher royalty rate for minerals extracted from certain categories of land
- The Online Auction system facilitates a transparent and competitive bidding process for mining. Mineral blocks are made available for auction through an online platform, where interested parties can submit bid, it provides easy access to information about available mineral blocks, including details on reserves, geological data, and previous production levels.

Outcomes

- 984 applications for granting of the Quarry leases in private land received on online portal within the last two years
- Mines are directly allocated with double royalty till now, Pre – approval given by CGM-243, Pre – approval given by IMD-40, Granted-02
- Revenue generated through direct allotment of leases - 438.39 Lacs. in upfront Payment, 3.68 Lacs. Royalty

4. Cluster-wise Environmental clearance (EC) grant for Minor Minerals (China-Clay, Sandstone etc.)

Features and Highlights of the system:

- The cluster-based approach to grant Environmental Clearance (EC) for minor minerals like China-clay and Sandstone, etc involves grouping mining leases within a certain geographical area (upto 10 kms) to assess their combined environmental impact rather than evaluating them individually

Outcomes

- 11 ECs have been granted for cluster mines
- For the district Chhotaudepur and Vadodara Ultratech agency has applied for EC of the entire cluster under the name of District Geologist which is taken as Pilot Project
- In addition, Environment Clearance (EC) of the entire cluster is applied in the name of District geologist so that Environment Clearance (EC) will be approved in the name of District Geologist and it will be transferred in the name of lease holder/block holder after approval

Source: State Ministry information received and secondary research

Thematic Area: Exploration and Mines development

5 Digitization, Segregation and Categorization of Past Exploration data/reports

Since 1961, the Commissionerate of Geology and Mining (CGM) in Gujarat has been actively engaged in extensive mineral exploration activities, leading to the establishment of significant mineral resources through various survey methods, including Pre-Detailed and Detailed Mineral Surveys

Features and Highlights of the system:

- Between 2018-2020, all reports were digitized and geo-referenced.
- MoU signed with GSI for enhanced geochemical mapping efforts
- In August 2024, CGM organized a workshop titled "Gujarat's Mineral Wealth: A Responsible Exploration and Development Paradigm," aimed at promoting engagement from NEAs & NPEAs

Outcomes

- 100% exploration records has been digitized. AutoCad and Arc GIS softwares used for digitize data. All the record has been handed over to GSI for upload on NGDR Portal.
- The August 2024 workshop led to 202 applications for NOCs from NEAs/NPEAs.
- 709 exploration reports prepared by CGM since 1961
- Comprehensive assessment conducted by external geological experts, which identified 189 mineral potential blocks for future exploration endeavours.

6 Petrography & Mineral Chemistry Laboratory

The Petrography and Mineral Chemistry laboratory is equipped with modern mineral testing equipment like X-ray Diffractometer, Atomic Absorption Spectrophotometer etc. It has the distinction of being recognized as Research and Development Laboratory for minerals. Samples received after prospecting and exploration by the department, public sector undertakings and private entrepreneurs are analyzed in the Petrography and Chemical Laboratory of this Department to establish the physico-chemical characterization of the mineral.

Features and Highlights of the system:

- The lab is currently undergoing an upgrade through the acquisition of the State of Art instruments funded by NMET.
- CGM intend to develop a core library aimed at systematic and scientific preservation of cores and the Government of Gujarat has allocated an appropriate parcel of land for the same. The design phase is completed.

Outcomes

- The laboratory processes numerous samples; for instance, around 1,404 half-split core samples were recently sent for testing
- KGCMP & GGCMP (NGCM) samples were analyzed for 58 elements
- From the year 2009-10 to 2016-17 total about 25 Cr has been handed over to GMDC by State

Thematic Area: Social Projects implementation

7 The Stone Artisan Park Training Institute (SAPTI)

It is a premier center established by the Gujarat government to preserve and promote traditional stone-carving crafts. SAPTI offers comprehensive training programs combining ancient techniques with modern tools, empowering artisans with advanced skills and market access.

Features and Highlights of the system:

- Equipped with state-of-the-art facilities, the institute supports artisans in creating intricate designs, enhancing their livelihoods, and preserving cultural heritage. SAPTI fosters entrepreneurship, facilitates domestic and international market linkages, and contributes to heritage conservation projects.
- By empowering local communities, it ensures the continuity of Gujarat's rich stone-carving tradition while promoting innovation and economic development

Outcomes

- SAPTI fosters entrepreneurship, facilitates domestic and international market linkages, and contributes to heritage conservation projects.
- SAPTI conducted art related awareness/Summer camp for regional school-going students.
- SAPTI Ambaji has worked in close coordination in Ambaji with the Ambaji Marble Quarry and Factory Association and District Administration in successfully processing the application for GI tagging of Ambaji White Marble. The GI No. 1114.

8 Skill Development

Under section 9(B) of MMDR Act, 1957 District Mineral Foundation for the implemantation of Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) is established in 32 mining affected districts. The state works with mining companies like Gujarat Mineral Development Corporation (GMDC) to design and fund training programs specific to the mining industry. Partnerships with organizations like the Federation of Indian Mineral Industries (FIMI) and Gujarat Chamber of Commerce and Industry (GCCI) ensure alignment of skilling programs with industry demands. The state partners with institutions like Gujarat Technological University (GTU) and Industrial Training Institutes (ITIs) to offer specialized courses in mining technology, geology, and machinery operation.

Features and Highlights of the system:

- Project Samarthya: Skill Development Programs under the District Mineral Foundation (DMF) untill 2021
- GMDC Skill Development Centers: These centers provide technical training in mining-related trades such as drilling, blasting, and machinery maintenance.
- SAPTI: Focuses on traditional and modern stone carving techniques to empower artisans and create employment opportunities.
- Compliance mechanisms are set for the implemantation of DMFs with the new guidelines under PMKKKY 2024 at 32 DMFs with state level monitoring committee, with Chief secretary as the Chairperson at State level.

Outcomes

- Developed 3-month Short term Course/DST with regional ITI's for upskilling of students.
- Conducted Upskilling Workshops for Agate Artisans from Khabhat.
- SAPTI Ambaji is onboarded for the Pradhan Mantri Vishwakarma Yojna Scheme as a Training center for Stone Sculptor and Blacksmith trade..
- MoU signed with Kaushlya - The Skill University, HNGU - Patan, CVM - Vallabh Vidyanagar, Federation of Indian Granite and Stone Industry, Regional ITIs.
- Partnerships with local NGOs at district level through DMF wherein the decisions of such programs are solely led by district officials to encourage in participation in skilling and capacity-building programs in mining areas

Thematic Area: Technology, research and development

9 Research and Development

Gujarat Mineral Reseach & Industrial Consultancy society (GMRICS) is constituted under Gujarat Mineral Development Corporation (GMDC) exploration, exploitation, and extraction of minerals (especially critical) needed for the Atmanirbhar Bharat.

Features and Highlights of the system:

- The Gujarat Mineral Policy (2017) outlines the state's commitment to promoting research and technological advancements in the mining sector. It encourages the use of modern mining techniques, equipment, and methods to improve productivity and reduce environmental impact.
- The policy facilitates the establishment of R&D centers within the mining industry by offering incentives like subsidies and tax benefits for companies investing in research

Outcomes

- Gujarat State Biotechnology Mission (GSBTM): In partnership with universities and research institutions, GSBTM supports bio-mining and other innovative technologies through grants and collaborative research projects. These grants encourage the development of mining-specific solutions using biotechnology and green technologies.

Source: State Ministry information received and secondary research

Summary of Initiatives & Recommendations - Gujarat (1/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Gujarat						

 No initiatives adopted
 *0-25% initiatives adopted*
 *25-50% initiatives adopted*
 *50-75% initiatives adopted*
 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1	**Integrated Lease Management System 2.0**	▪ Approx. 1500 financials transactions worth of more than Rs.4 crores are being managed daily. Growth in revenue generation and timely payment due system checks and alerts, Interlinked revenue (DMF, TCS, etc.) ▪ More than 60,000 transit pass generation daily. ▪ Generation of Periodic pre-defined and customized MIS reports leads to revenue planning and budgeting. ▪ Faster Service Delivery, Real time accounting and receipt generation. Proactive actions and quick decision/approval due to System alerts
2	**Pre-Embedded Clearance under PMU**	▪ The fees for obtaining these clearances shall also be initially borne by the state government and subsequently recouped from the successful bidder. ▪ By securing clearances beforehand, the initiative aims to significantly cut down on the time it takes for mining companies to begin operations after winning an auction
3	**Issuance of lease on Double Royalty & Online auction**	▪ 984 applications for granting of the Quarry leases in private land received on online portal within the last two years ▪ Mines are directly allocated with double royalty till now, Pre – approval given by CGM-243, Pre – approval given by IMD-40, Granted-02 ▪ Revenue generated through direct allotment of leases - 438.39 Lacs. in upfront Payment, 3.68 Lacs. Royalty
4	**Digitization, Segregation and Categorization of Past Exploration data/ reports**	▪ The August 2024 workshop led to 202 applications for NOCs from NEAs/NPEAs. 709 exploration reports prepared by CGM since 1961 ▪ Comprehensive assessment conducted by external geological experts, which identified 189 mineral potential blocks for future exploration endeavours.
5	**Petrography & Mineral Chemistry Laboratory**	▪ The laboratory processes numerous samples; for instance, around 1,404 half-split core samples were recently sent for testing ▪ KGCMP & GGCMP (NGCM) samples were analyzed for 58 elements
6	**Research and Development**	▪ Gujarat State Biotechnology Mission (GSBTM): In partnership with universities and research institutions, GSBTM supports bio-mining and other innovative technologies through grants and collaborative research projects. These grants encourage the development of mining-specific solutions using biotechnology and green technologies
7	**The Stone Artisan Park Training Institute (SAPTI)**	▪ SAPTI conducted art related awareness/Summer camp for regional school-going students ▪ SAPTI Ambaji has worked in close coordination in Ambaji with the Ambaji Marble Quarry and Factory Association and District Administration in successfully processing the application for GI tagging of Ambaji White Marble. The GI No. 1114. ▪ SAPTI fosters entrepreneurship, facilitates domestic and international market linkages, and contributes to heritage conservation projects.
8	**Skill Development**	▪ Developed 3-month Short term Course/DST with regional ITI's for upskilling of students ▪ Conducted Upskilling Workshops for Agate Artisans from Khabhat. ▪ SAPTI Ambaji is onboarded for the Pradhan Mantri Vishwakarma Yojna Scheme as a Training center for Stone Sculptor and Blacksmith trade. ▪ MoU signed with Kaushlya - The Skill University, HNGU - Patan, CVM - Vallabh Vidyanagar, Federation of Indian Granite and Stone Industry, Regional ITIs.
9	**Cluster-wise Environmental clearance (EC) grant for Minor Minerals**	▪ 11 ECs have been granted for cluster mines ▪ For the district Chhotaudepur and Vadodara Ultratech agency has applied for EC of the entire cluster under the name of District Geologist which is taken as Pilot Project ▪ In addition, Environment Clearance (EC) of the entire cluster is applied in the name of District geologist so that Environment Clearance (EC) will be approved in the name of District Geologist and it will be transferred in the name of lease holder/block holder after approval

Summary of Initiatives & Recommendations - Gujarat (2/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Gujarat						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Mineral Administration and Mineral Concession

Other states have adopted other initiatives:
- Post auction facilitation establishment
- Facilitating Compensatory Afforestation
- These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines

Exploration and Mines development

Other states have been actively pursuing initiatives:
- Strategic Collaboration for Mineral Resource Mapping
- Establishment of State Mineral exploration trust
- Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation

Sustainable Mining Practices

Other states have adopted other initiatives:
- M-Sand Policy
- Star Rating of Minor Minerals
- Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development

Technology, research and development

Other states have adopted other initiatives:
- Drone Survey of Quarries
- E-Check gate implementation
- Sand Mine Portal
- These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.

Social project implementation

Other states have adopted other initiatives:
- Mines and Mineral Restoration and Rehabilitation Fund
- DMF Portal
- Upgradation of Healthcare services
- These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Mine closure, waste management , reclamation and rehabilitation

Other states adopted the initiatives:
- Management of Abandoned mines
- Dumping of Overburden and waste outside the lease area for Minor minerals
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Skilling and Capacity Building

Other states have adopted the initiatives:
- Human Resource Development
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

For more information, visit the following website: Commissioner of Geology and Mining

5.4 State-wise initiatives and outcomes

7. Haryana

Haryana Mineral Scenario

- The key minerals found in Haryana include limestone, dolomite, China clay, quartzite, and sand, which are mainly used in the construction, cement, and glass industries. Additionally, minor occurrences of iron ore, gypsum, and graphite are also found in certain districts
- Limestone and dolomite are among the most important minerals in Haryana, with major deposits in the Mahendragarh and Ambala districts. These minerals are crucial for cement production, chemical manufacturing, and the iron and steel industry.
- Kankar, a form of calcite, is found in the alluvial plains of the state, particularly in the Bhiwani and Mahendragarh districts. This mineral is widely used in construction and agriculture. Other notable minerals include quartzite, which is useful for manufacturing glass, and gypsum, found in limited quantities in the Hissar and Bhiwani district
- Given the state's resources, there is also potential for Haryana to become a regional hub for mineral-based industries, especially in sectors like cement, ceramics, and building materials

What's going on so far...

- The Haryana government has undertaken several initiatives to enhance the mining sector, focusing on sustainable mining practices and efficient resource utilization.
- This includes initiatives to reduce illegal mining, ensure better environmental management, and explore further opportunities for public-private partnerships in the mining sector.

Best Practices adopted by Haryana

Thematic Area: Mineral Administration

1 e-Governance through HEPC portal:

- The Mines & Geology department is granting following services online through the HEPC portal. Departmental portal/application for following services have been developed:

  i. Grant/Renewal of Mineral Dealer Licence
  ii. Grant/Renewal of Stone Crusher
  iii. Grant/Renewal permit for Excavation of Brick Earth
  iv. Permit for Excavation of ordinary clay or earth; and
  v. Permit for the Grant of Permission for Disposal of Mineral

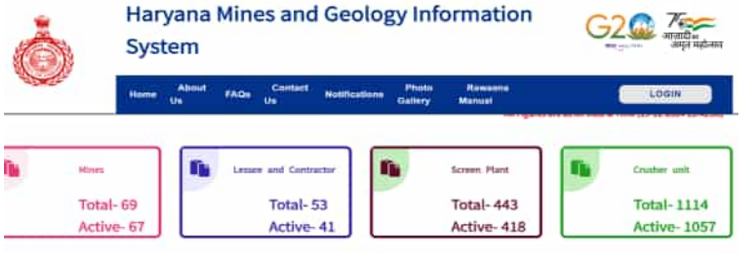
- All these services of the department are business oriented. Any applicant requiring any of the above said service is required to fill application form for respective service along with all documents.

Highlights:

- Switched over from open auction system to e-auction system for granting mineral concessions in respect of minor minerals
- Critical real time information of various mines would be available on e-module.
- Haryana knowledge Corporation Ltd. has been engaged for the purpose of preparation of e-governance system
- HMGIS portal was also launched to track real time location of weighbridge and mineral laded vehicles. Weight of the mineral laded vehicle is also captured automatically by this portal

Outcomes :

- E-auctions in 9 districts have already taken place in 2023-24 for granting mineral concessions in respect of minor minerals– Palwal, Faridabad, Karnal, Mahendargarh, Charkhi Dadri, Bhiwani, Ambala, Yamunanagar, Sonipat
- Prohibition of virtual sale/purchase i.e. crusher to crusher, screening plant to screening plant and illegal mining
- Prohibition of malpractices by unit holders, since the weight of mineral laded vehicle is captured automatically



Source: State Ministry information received and secondary research

2 Checking of Illegal mining:

The Government has notified the District Level Task Force under the Chairmanship of the Deputy Commissioner with Superintendent of Police and other related senior functionaries as members in each of the concerned district, in order to monitor/stop any incidence of illegal mining and ensure compliance with the orders of the Hon'ble Supreme Court of India in this behalf.

Highlights:

- Haryana Minor Mineral Concession, Stocking, Transportation of Minerals and Prevention of Illegal Mining Rules, 2012 notified on 20.06.2012. The State Rules have been framed under Section 15 & 23C of the Central Act, 1957.
- The District level Task Forces are entrusted with the responsibility of keeping a regular watch and to take appropriate action in stray cases of any incidence of illegal mining in the districts.
- The State of Haryana is working on zero tolerance policy against illegal mining and all necessary steps are being taken to ensure that no illegal mining takes place in any part of the state.

Outcomes (Consolidated vehicle summary from w.e.f 28.08.2019 to 31.07.2024) :

- Amount of penalty recovered – Rs. 183.33 Cr.
- Total no. of cases seized – 12,379
- Total no. of cases released– 10,106
- Total no. of cases pending – 2,273
- Vehicles Released on Appeal of Recovery of Penalty – 5,847

Thematic Area: Social Project Implementation

3 District Mineral Foundation:

The Central Government amended Mines & Minerals Development and Regulation Act, 1957 in January, 2015. One of the amendment was insertion of Section 9B, as per which District Mineral Foundations (in short DMF) for each of the districts were to be constituted with object to work for the interest and benefit of persons and areas affected by mining and other mining-related operations. As per existing provisions of the State Rules,2012 the mines in operation are liable to pay additional amount of 7.5 % to a fund namely Mines and Mineral Restoration and Rehabilitation Fund, the state government is also contributing 2.5% of the amount received by the Government on account of the dead rent, royalty and contract money.

Highlights:

- The DMF operates in alignment with PMKKKY guidelines, which aim to implement developmental projects that mitigate adverse impacts of mining on the environment and local communities
- The foundation collects funds from mining lease holders, who contribute a portion of their royalty payments.
- The DMF prioritizes funding for high-impact areas such as drinking water supply, health care, education, and environmental preservation.
- DMF needs to minimize/mitigate the adverse impacts, during and after mining, on the environment, health and socio-economics of people in mining districts

Outcomes :

- Total amount allocated across different sectors is around INR 157.9 crores, out of which amount utilized for the objectives of DMF is until 31/07/2024 is around INR 69.8 crores
- Employment Generation and Skill Development: The DMF initiatives include programs aimed at enhancing skills and generating employment opportunities for local residents. This focus on skill development helps mitigate the socio-economic impacts of mining and promotes sustainable livelihoods

Summary of Initiatives & Recommendations – Haryana (1/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Haryana						

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 *0-25% initiatives adopted*
 *25-50% initiatives adopted*
 *50-75% initiatives adopted*
 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1	e-Governance through HEPC Portal	▪ E-auctions in 9 districts have already taken place – Palwal, Faridabad, Karnal, Mahendargarh, Charkhi Dadri, Bhiwani, Ambala, Yamunanagar, Sonipat ▪ Prohibition of virtual sale/purchase i.e. crusher to crusher, screening plant to screening plant and illegal mining ▪ Prohibition of malpractices by unit holders, since the wight of mineral laded vehicle is captured automatically
2	Checking of Illegal mining	▪ Outcomes (Consolidated vehicle summary from w.e.f 28.08.2019 to 31.07.2024) ▪ Amount of penalty recovered – Rs. 183.33 Cr. ▪ Total no. of cases seized – 12,379 ▪ Total no. of cases released– 10,106 ▪ Total no. of cases pending – 2,273 ▪ Vehicles Released on Appeal of Recovery of Penalty – 5,847
3	District Mineral Foundation	▪ Total amount allocated across different sectors is around INR 157.9 crores, out of which amount utilized for the objectives of DMF is until 31/07/2024 is around INR 69.8 crores ▪ Employment Generation and Skill Development: These DMF initiatives efforts address socio-economic challenges of mining and foster sustainable livelihoods.

Recommendation

Mineral Administration and Mineral Concession	▪ Other states have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	▪ Other states have been actively pursuing initiatives: ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Sustainable Mining Practices	▪ Other states have adopted other initiatives: ▪ M-Sand Policy ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development
Social project implementation	▪ Other states have adopted other initiatives: ▪ Upgradation of Healthcare services ▪ These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Summary of Initiatives & Recommendations - Haryana (2/2)

Initiative overview

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 *0-25% initiatives adopted*

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 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Technology, research and development

- Other states have adopted other initiatives:
- Mine Surveillance system
- Drone Survey of Quarries
- E-Check gate implementation
- Sand Mine Portal
- These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.

Mine closure, waste management, reclamation and rehabilitation

- Other states have adopted the initiatives:
- Management of Abandoned mines
- Dumping of Overburden and waste outside the lease area for Minor minerals
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Skilling and Capacity Building

- Other states have adopted the initiatives:
- Human Resource Development
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

For more information, visit the following website: *Home | Mines and Geology Department , Government of Haryana , India*

5.4 State-wise initiatives and outcomes

8. Himachal Pradesh

Himachal Pradesh Mineral Scenario

- Himachal Pradesh is rich in various minerals, including limestone, rock salt, gypsum, barytes, iron ore, copper, and mica. The State is the sole holder of country's antimony ore and rock salt resources. Limestone and shale are the important minerals produced in the State.
- Barytes occurs in Sirmaur district; limestone in Bilaspur, Chamba, Kangra, Kulu, Mandi, Shimla, Sirmaur & Solan districts; and rock salt in Mandi district.
- Other minerals that occur in the State are antimony in Lahaul & Spiti districts; gypsum in Chamba, Sirmaur and Solan districts; magnesite in Chamba district; pyrite in Shimla district; and quartz, quartzite & silica sand in Una district

What's going on so far...

- The mining sector in Himachal Pradesh contributes significantly to the local economy by providing employment opportunities and generating revenue through mining leases and royalties.
- The government's efforts to modernize the sector and focus on responsible mining practices are crucial for maximizing the benefits of Himachal Pradesh's mineral resources while minimizing their environmental impact

Best Practices adopted by Himachal Pradesh

1.Thematic area: Mineral Administration

1 Grant of Mining leases for riverbeds

In most parts of the State, the mining leases have been granted over the riverbeds for various rivers for which the Department of Environment, Sciences and Technology with assistance of department will prepare and the District survey reports

Highlights:

- DSRs of approved areas are only allowed for mining operations post the recommendations of the Joint inspection committee which is headed by Sub Divisional Magistrate consisting members from various departments Such as Public Works , Jal shakti Vibhag, Forest department, State Pollution control board, Mining officer etc
- The Mining leases are only granted only after the approval of the mining plan. Moreover, mineral concession is granted without obtaining Environment clearance of the area applied for the grant

Outcomes:

- Riverbeds are always replenishable annually after every six months making the practice eco-friendlier for sustainable development
- The grant of riverbed sand mining leases in Himachal Pradesh brings multiple benefits, including economic growth, infrastructure development, job creation, and improved governance. However, it is crucial to balance these benefits with environmental protection. Sustainable mining practices, effective monitoring, and community involvement are necessary to ensure that the state can continue to extract resources while preserving its rich natural environment for future generations

Source: State Ministry information received and secondary research

Summary of Initiatives & Recommendations - Himachal Pradesh (1/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Himachal Pradesh						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1.	Grant of Mining leases for riverbeds	▪ Riverbeds are always replenishable annually after every six months making the practice eco-friendlier for sustainable development ▪ The grant of riverbed sand mining leases in Himachal Pradesh brings multiple benefits, including economic growth, infrastructure development, job creation, and improved governance. However, it is crucial to balance these benefits with environmental protection. Sustainable mining practices, effective monitoring, and community involvement are necessary to ensure that the state can continue to extract resources while preserving its rich natural environment for future generations

Recommendation

Mineral Administration and Mineral Concession	▪ Other states have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	▪ Other states have been actively pursuing initiatives such as ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Sustainable Mining Practices	▪ Other states have adopted: ▪ M-Sand Policy ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development
Technology, research and development	▪ Other states have adopted other initiatives ▪ Drone Survey of Quarries ▪ E-Check gate implementation ▪ Sand Mine Portal ▪ These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.
Social project implementation	▪ Other states have adopted other initiatives: ▪ DMF Portal ▪ Mines and Mineral Restoration and Rehabilitation Fund ▪ Upgradation of Healthcare services ▪ These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Summary of Initiatives & Recommendations - Himachal Pradesh (2/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Himachal Pradesh						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Mine closure, waste management , reclamation and rehabilitation	▪ Other states have adopted the initiatives such ▪ Management of Abandoned mines ▪ Dumping of Overburden and waste outside the lease area for Minor minerals ▪ These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.
Skilling and Capacity Building	▪ Other states have adopted the initiatives such ▪ Human Resource Development ▪ This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

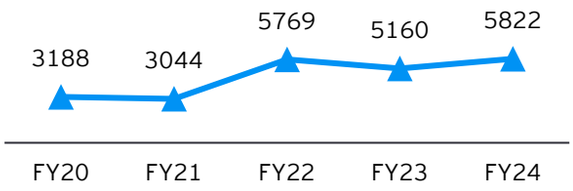
For more information, visit the following website: *MINING - HIMACHAL PRADESH*

5.4 State-wise initiatives and outcomes

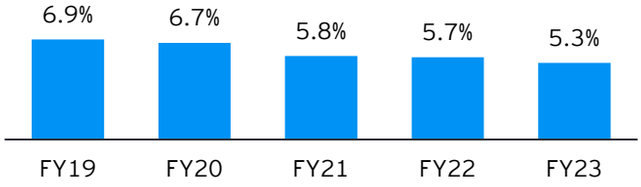
9. Jharkhand

KPIs so far....

Value of mineral production, INR Cr



Mining contribution (%) to State GDP



Jharkhand Mineral Scenario

- Jharkhand, located in the eastern part of India, is one of the country's most mineral-rich states, contributing significantly to India's mining industry. Known for its vast deposits of coal, iron ore, bauxite, limestone, and mica
- Jharkhand accounts for nearly 40% of India's total mineral production, with coal being the most abundant resource, followed by iron ore and mica.
- The state also has substantial reserves of copper, bauxite, and limestone, which are essential for various manufacturing industries. In addition to its mineral wealth, Jharkhand is strategically positioned for industrial growth, with investments in steel production, power generation, and mineral processing.

What's going on so far...

- The state government is focused on enhancing the mining sector through improved exploration, sustainable practices, and infrastructure development.
- This makes Jharkhand a crucial state in India's mining and industrial landscape, contributing significantly to the national economy while seeking to balance industrial growth with environmental sustainability

Best Practices adopted by Jharkhand

Thematic Area: Mineral Administration

1 Jharkhand Integrated Mines and Mineral Management system(JIMMS): JIMMS has been designed to automate all mining processes, facilitating multiple stakeholders to play their respective part in managing the valuable information that helps in curbing down any illegality and irregularity

Highlights:

- Comprehensive and robust software, IT application-based e-Governance mineral administration Platform
- Designed to automate all processes as per the Central Acts and State Rules
- Covers all 6 Mining Circles (Kolhan, Hazaribagh, South Chotanagpur, Santhal Pargana, Dhanbad and Palamu) in 24 Districts
- Digitalized e-Permit and Transit e-challan Generation system

Outcomes:

- Mandated the challan for Rail, hence achieved approx. 100 percent challan generation for mineral transportation
- 1,22,718 users in 64 different set of user type
- 471,767 Lessee/Dealer e-Permits granted since inception to till 15-Oct-2024
- 5,13,73,205 Transport Challan generated till May'24

Thematic Area: Exploration and mines development

2 Jharkhand Exploration and Mining Corporation Limited :

Highlights:

- The main objective of this organization is to undertake Greenfield and Brownfield mineral exploration in Jharkhand for the purpose of preparation of auctionable mineral blocks.
- It has been entrusted with an objective to carry out scientific exploitation of the mineral wealth, to participate in the auctions/e-auctions/sub-auctions of mineral blocks, to engage and obtain mineral concession and undertake activities of mining operation, trading, sale-purchase, import-export of minerals and its bi-product.

Outcomes:

- It has been empowered for the establishment of various processes, beneficiation and mineral based industries and to provide consultancy services, including activities required for fulfilment of various statutory requirement including mining plan, forest clearance proposal, EIA/EMP etc. within Jharkhand and elsewhere

Source: State Ministry information received and secondary research

Thematic Area: Technology, research and development

3 VTS stands for Vehicle Tracking System:

System initiated by Department of Mines and Geology, Jharkhand. It is a technology-driven solution implemented by the Jharkhand Government to monitor the movement of vehicles involved in mineral transportation.

Highlights:

- Real-time tracking: Monitors the location of vehicles in real-time, allowing authorities to track their movements and identify any deviations from authorized routes.
- Alerts and notifications: Generates alerts for unauthorized movements, speeding, or other violations, enabling timely intervention.
- Data analysis: Analyzes collected data to identify patterns, trends, and potential risks.

Outcomes :

- Improved transparency: Increases transparency in mineral transportation, reducing the potential for corruption and illegal activities.
- Enhanced security: Enhances security by deterring theft and other illegal practices
- Efficient monitoring: Enables efficient monitoring of vehicle movements, ensuring compliance with regulations..

Thematic Area: Social Project Implementation

4 MNV(Malnourishment Treatment Van): MNV was initiated with an objective to create a sustainable approach for improvement in reducing the malnourishment of the targeted area

Highlights:

- Conducting social assessment of the families and villages to identify and address contributing factor for malnutrition.
- Micro-Planning at panchayat level with all concerned stakeholders on nutritional challenges
- Providing Therapeutic Care, feeding and treatment of medical complication at door service.
- Counselling on appropriate feeding practices and follow-up of discharged Children by creating database of their feeding practices and social & economical background

Outcomes:

- 617 Front Line Workers(FLWs) participated from 25 blocks for the training at the district level.
- 1380 Nutrition kits were distributed amongst the beneficiaries
- 5421 Household were surveyed in phase one out of which 579 malnourished children were treated in the targeted area.
- 905 Anaemia patients were tested and treated

5 UPGRADATION OF HEALTHCARE SERVICES IN HAZARIBAGH: It aims to modernize medical infrastructure, ensuring accessible and high-quality care for all residents. The initiative focuses on enhancing facilities, introducing advanced technologies, and expanding specialized services to address critical health needs in the region

Highlights:

- Renovation of 01 SDH and 08 CHCs.
- 27 Health personnels including 02 specialist doctors recruited by DMFT are working in different health centres of the district.
- Procurement & Distribution of medical equipment and other supplies in Sadar Hospital, SDH and CHCs of the district.

Outcomes:

- 480 Sahiya kits were distributed to 'Sahiya Didis'.
- Procurement and Installation of 2 generators (250 KVA) for PSA Plant in Sadar Hospital.

6 ESTABLISHMENT OF LEMON GRASS DISTILLATION UNIT IN BOKARO: DMFT (District Mineral Foundation Trust), Bokaro, has sanctioned a Lemon Grass Distillation unit with a packaging, storage, and production capacity of 2,400 liters and handed over to Luguburu Farmer Producer Company for market linkage.

Highlights:

- It will play a crucial role in meeting the processing needs of Lemon Grass, thereby supporting the overall goals of the Luguburu Farmer Producer Company.

Outcomes:

- The project started with a fund of Rs. 19 Lakhs is expected to benefit more than 500 farmers.

7 Arogya Kunji in Chatra: Arogya Kunji will address the issue of accessibility as same is a major issue in Chatra, since 60 % of its area is forest cover.

Highlights:

- Arogya Kunji helped the people for temporary ailments/temporary relief (especially during night) and for major cases they can go to the nearest Primary Health Centre (PHC) / Health Sub Centres (HSC) during the daytime.
- Total cost of the project stood at Rs. 12,26,392

Outcomes:

- Number of Sahiyas covered under DMF in the District is 656.
- Arogya Kunj enabled the villages to ensure affordability and availability of common drugs

Summary of Initiatives & Recommendations - Jharkhand (1/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Jharkhand						

S.No.	Initiative adopted	Impact from adoption of Initiative
1	Jharkhand Integrated Mines and Mineral Management system(JIMMS)	▪ Mandated the challan for Rail, hence achieved approx. 100 percent challan generation for mineral transportation ▪ 1,22,718 users in 64 different set of user type ▪ 471,767 Lessee/Dealer e-Permits granted since inception to till 15-Oct-2024 ▪ 5,13,73,205 Transport Challan generated till May'24
2	Jharkhand Exploration and Mining Corporation Limited	▪ It has been empowered for the establishment of various processes, beneficiation and mineral based industries and to provide consultancy services, including activities required for fulfilment of various statutory requirement including mining plan, forest clearance proposal, EIA/EMP etc. within Jharkhand and elsewhere
3	Vehicle Tracking System	▪ Improved transparency: Increases transparency in mineral transportation, reducing the potential for corruption and illegal activities. ▪ Enhanced security: Enhances security by deterring theft and other illegal practices ▪ Efficient monitoring: Enables efficient monitoring of vehicle movements, ensuring compliance with regulations..
4	MNV(Malnourishment Treatment Van)	▪ 617 Front Line Workers(FLWs) participated from 25 blocks for the training at the district level. ▪ 1380 Nutrition kits were distributed amongst the beneficiaries ▪ 5421 Household were surveyed in phase one out of which 579 malnourished children were treated in the targeted area. ▪ 905 Anaemia patients were tested and treated
5	Upgradation of Healthcare services in Hazaribagh	▪ 480 Sahiya kits were distributed to 'Sahiya Didis'. ▪ Procurement and Installation of 2 generators (250 KVA) for PSA Plant in Sadar Hospital.
6	Establishment of Lemon Grass distillation Unit in Bokaro	▪ The project started with a fund of Rs. 19 Lakhs is expected to benefit more than 500 farmers
7	Arogya Kunji in Chatra	▪ Number of Sahiyas covered under DMF in the District is 656. ▪ Arogya Kunj enabled the villages to ensure affordability and availability of common drugs

Recommendation

Mineral Administration and Mineral Concession	▪ Other states have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	▪ Other states have been actively pursuing initiatives: ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation

Summary of Initiatives & Recommendations - Jharkhand (2/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Jharkhand						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Sustainable Mining Practices	▪ Other states have adopted other initiatives: ▪ M-Sand Policy ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development
Technology, research and development	▪ Other states have adopted other initiatives: ▪ Mine Surveillance system ▪ Drone Survey of Quarries ▪ E-Check gate implementation ▪ Sand Mine Portal ▪ These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.
Social project implementation	▪ Other states have adopted other initiatives: ▪ DMF Portal ▪ Mines and Mineral Restoration and Rehabilitation Fund ▪ These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .
Mine closure, waste management , reclamation and rehabilitation	▪ Other states have adopted the initiatives: ▪ Management of Abandoned mines ▪ Dumping of Overburden and waste outside the lease area for Minor minerals ▪ These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.
Skilling and Capacity Building	▪ Other states have adopted the initiatives: ▪ Human Resource Development ▪ This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

For more information, visit the following website: *Department of Mines and Geology, Government of Jharkhand*

5.4 State-wise initiatives and outcomes

10. Jammu & Kashmir

Jammu & Kashmir Mineral Scenario

- Jammu & Kashmir is the sole holder of country's borax, sapphire and sulphur resources. Coal, gypsum and limestone are the important minerals produced in the State.
- Coal occurs in Kupwara district; gypsum in Baramulla & Doda districts; limestone in Anantnag, Baramulla, Kathua, Leh, Poonch, Pulwama, Rajauri, Srinagar & Udhampur districts; and magnesite in Leh & Udhampur districts.

What's going on so far...

- The mining sector in Jammu & Kashmir contributes significantly to the local economy by providing employment opportunities and generating revenue through mining leases and royalties.
- The state's mineral wealth supports various industries, including cement manufacturing, aluminum production, and decorative stone processing, thus fostering economic development in the region

Best Practices adopted by Jammu & Kashmir

Thematic Area: Mineral Administration

1 e-Auction of Minor mineral blocks:

Feasible Minor Mineral Blocks of all the River beds/Nallahs were prepared and put to e-auction through District Level Auction Committee under the Chairmanship of Deputy Commissioner

Highlights:

- The department had identified/carved out 387 Mineral Blocks across the Jammu & Kashmir UT in the year 2019-20 and 2020-21
- Bidders are required to comply with several regulations, including submitting annual turnover certificates and obtaining necessary clearances from various stakeholders

Outcomes :

- 200 mining leases were granted in 2019-20 and 2020-21 in favour of the successful bidders after obtaining NOCs of concerned stakeholder department under Single Window System, Mining plan approved from the competent authority, environmental clearances issued by JKEIAA/DEIAA and consent to operate issued from the J&K Pollution Control Board/Committee
- 8 Mining leases were also reserved/granted in favour of J&K Public Sector undertaking (J&K Minerals Ltd. and JKPCC)
- During the year 2022-23 and 2023-24, the Department has e-auctioned 21 more Minor Mineral blocks in left out/uncovered areas after obtaining the NOCs under Single Window System (SWS) from concerned departments

2 District Level Task force formulation:

A Multi departmental District Level Task force cell has been constituted as per an order dated 22.10.2018, under the chairmanship of Deputy Commissioner concerned

Highlights:

- This has been constituted to curb the illegal mining issues in the district
- The rates of Minor Minerals including Sand in all the districts of J&K UT have been fixed by the District Administration of concerned district for regulating the Sale Price of Minor minerals
- The department has also constituted Vigilance cum Monitoring Flying squad/enforcement team

Outcomes :

- Would strengthen surveillance on illegal extraction & transportation of minor minerals in the J&K UT
- Enhanced coordination: By bringing together representatives from different departments, the task force can expedite decision-making processes.

Source: State Ministry information received and secondary research

3 E-challan:

For proper transportation of Minor Minerals, transportation challans with security features of Unique Bar code, Unique quick response code, water mark has been introduced

Highlights:

- The department launched online web portal on 24th August, 2022 for sale and purchase of minerals online at notified rates, wherein current manual challan has been replaced with E-challan
- The E-Challan has secured QR Code, Water Mark, Validity of challan and Unique Challan No. and details of vendor/lessee etc.

Outcomes :

- Enhanced transparency and ease of doing business
- Will ensure proper transportation of mineral and curb illegal mining

Thematic Area: Technology, research and development

4 Hi-Tech systems with CCTVs at various check posts:

The department has taken up the construction work of several check posts and is in process to install Hi-Tech system with CCTVs to monitor the transportation of minor minerals including riverbed material in J&K UT

Highlights:

- Hi-Tech CCTVs typically provide high-definition (HD) video recording, which ensures superior image clarity.
- Advanced CCTV systems may include video analytics capabilities that utilize machine learning algorithms to detect unusual behaviors or specific triggers (e.g., loitering or unauthorized access).

Outcomes :

- 22 such Mineral check posts have been constructed for monitoring illegal extraction & transportation of minerals
- In 2023-24, penalty imposed for illegal mining has been around Rs. 19.2 crores.
- In 2023-24, 7,018 vehicles have been seized on account of illegal transportation of minerals

Summary of Initiatives & Recommendations - J&K (1/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Jammu & Kashmir						

S.No.	Initiative adopted	Impact from adoption of Initiative
1.	e-Auction of Minor mineral blocks	▪ 200 mining leases were granted in 2019-20 and 2020-21 in favour of the successful bidders ▪ 8 Mining leases were also reserved/granted in favour of J&K Public Sector undertaking (J&K Minerals Ltd. and JKPCC) ▪ During the year 2022-23 and 2023-24, the Department has e-auctioned 21 more Minor Mineral blocks in left out/uncovered areas
2.	District Level Task force formulation	▪ Would strengthen surveillance on illegal extraction & transportation of minor minerals in the J&K UT ▪ Enhanced coordination: By bringing together representatives from different departments, the task force can expedite decision-making processes.
3.	E-challan	▪ Enhanced transparency and ease of doing business ▪ Will ensure proper transportation of mineral and curb illegal mining
4.	Hi-Tech systems with CCTVs at various check posts	▪ 22 such Mineral check posts have been constructed for monitoring illegal extraction & transportation of minerals ▪ In 2023-24, penalty imposed for illegal mining has been around Rs. 19.2 crores. ▪ In 2023-24, 7,018 vehicles have been seized on account of illegal transportation of minerals

Recommendation

Mineral Administration and Mineral Concession	▪ Other states have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
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Technology, research and development	▪ Other states have adopted other initiatives ▪ Mine Surveillance system ▪ Drone Survey of Quarries ▪ E-Check gate implementation ▪ Sand Mine Portal ▪ These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.

Summary of Initiatives & Recommendations - J&K (2/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Jammu & Kashmir						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Social project implementation

Other states have adopted other initiatives:
- DMF Portal
- Mines and Mineral Restoration and Rehabilitation Fund
- Upgradation of Healthcare services
- These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Mine closure, waste management , reclamation and rehabilitation

Other states have adopted the initiatives such
- Management of Abandoned mines
- Dumping of Overburden and waste outside the lease area for Minor minerals
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Skilling and Capacity Building

Other states have adopted the initiatives such
- Human Resource Development
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

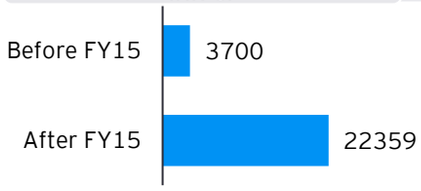
For more information, visit the following website: *Geology and Mining J and K*

5.4 State-wise initiatives and outcomes

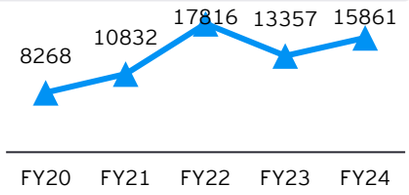
11. Karnataka

KPIs so far....

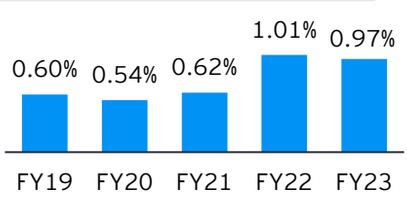
(Revenue Pre & Post Auction), INR Cr



Value of mineral production, INR Cr



Mining contribution (%) to State GDP



Karnataka Mineral Scenario

- Karnataka plays a significant role in India's mining industry, particularly known for its rich deposits of iron ore, gold, and other minerals. The state is a key player in the mining sector, contributing substantially to India's mineral production.
- The major mineral reserves in Karnataka include iron ore, limestone, dolomite, and gold, with the state's iron ore production being particularly notable in regions like Bellary, Chitradurga, and Tumkur
- Despite the state's rich mineral resources, Karnataka faces challenges related to illegal mining, environmental degradation, and balancing economic growth with sustainability. However, recent reforms, such as increasing the transparency of mineral auctions and improving enforcement of mining laws, have been steps towards mitigating these challenges.

What's going on so far...

- Karnataka has witnessed significant changes in its mining sector over the past decade, especially after the Supreme Court's intervention in 2011, which resulted in restrictions on illegal mining activities.
- The state's mining operations, especially iron ore extraction, are now more regulated, with a focus on environmental sustainability and legal compliance. A recent move to boost the sector includes promoting mining tourism, which leverages abandoned mining areas as tourist attractions.

Best Practices adopted by Karnataka

Thematic Area: Mineral Administration

1. Integrated Lease Management System (ILMS):

This is a web application interface for complete Integrated Lease Management System, which includes registration of the stake holders, bulk permits, e-payment, Mineral Dispatch Permit (MDP), fund management system, integration with weigh bridges / check-posts, etc.

- It is a highly secured web-based solution for mining lease holders.
- ILMS is an end-to-end solution from mining to end use of mineral, which has been integrated with various other applications like forest, treasury, GPS , weigh bridge, RFID, sand online sale etc.
- Lessee and other stakeholders can generate MDP for multimode transport of minerals.
- This has the following modules: ePermit, BSP Module, ePayment Module, eReturn Module, MPR, Report Module

Outcomes :

- This FY 2022-2023, the state collected Rs 5946 crore revenue (the state's revenue target for the full year is Rs 6,500 crore), achieving 91.5% of the target.
- 1,09,50,000 e-permits issued and 4500 Lessee registered through the ILMS portal adoption
- Total revenue generated through ILMS portal over the last 5 years is around Rs. 25,178 cr. Revenues in 2020, 2021, 2022, 2023, 2024 is Rs. 3,629 cr, 3,893 cr, 5,343 cr, 5389 cr and 6,924 cr respectively.

Source: State Ministry information received and secondary research

2. One State One GPS (OSOG):

This platform has been designed and implemented for all mineral transportation vehicle and GPS was integrated with existing ILMS of the lease holder to curb illegal transportation.

Highlights:

- It enables real-time tracking of all mineral transport vehicles across Karnataka, allowing authorities to monitor their movements continuously.
- The system integrates various data sources, including GPS data, to provide a unified platform for managing mineral transport.
- OSOG automates the generation of reports regarding mineral transport activities.

Outcomes :

- 56,300 mineral carrying vehicles are currently covered by One State One GPS platform
- Approximately 4,000 mineral carrying vehicles are still to be covered under One State One GPS platform
- It can help in curbing illegal transportation as well as maintaining transparency in mineral trade.
- Facilitates better decision-making and efficient resource allocation by consolidating relevant information in one place.

3. Modern Check post and interstate border checks:

This platform has been designed and implemented for all mineral transportation vehicle and GPS was integrated with existing ILMS of the lease holder to curb illegal transportation.

Highlights:

- Digital Documentation and Verification: The integration of digital platforms enables the electronic submission and verification of necessary documents such as permits and transit passes.
- Data Analytics for Compliance Monitoring: Advanced data analytics tools are employed to analyze traffic patterns and compliance data at check posts.
- Environmental Monitoring Capabilities: Some modern check posts incorporate environmental monitoring tools to assess the impact of mining activities on surrounding areas.

Outcomes :

- Reduction in paperwork, speeds up processing times, and enhances transparency in the transportation of minerals.
- Enables authorities to identify irregularities or potential illegal activities, allowing for proactive enforcement of mining regulations.
- This feature ensures that mining operations comply with environmental regulations, contributing to sustainable practices in the industry.

Thematic Area: Social Project Implementation

4 Integrated Centralized DMF web portal:

This has been developed to access Statewide information and District wise information on DMFT fund collection, project information, utilisation of funds etc., for general public on real time basis.

Highlights:

- The portal includes tools for monitoring ongoing projects funded by DMF resources.
- Centralized data management: The portal serves as a centralized repository for information related to all District Mineral Foundations in Karnataka, allowing for easy access to data on mineral resources, project implementations, and financial allocations.
- Designed with an intuitive interface, the portal allows users of varying technical expertise to navigate easily.

Outcomes :

- Centralization improves information availability for stakeholders
- Enhancement in transparency by allowing users to track how DMF funds are collected and utilized. This feature ensures that financial transactions are visible to the public, fostering accountability in the management of mineral resources.
- Improved accessibility, due to user friendly interface ensures that all relevant stakeholders can effectively utilize the available resources and data.

Thematic Area: Technology, research and development

5 Drone survey of Quarries

Drone Survey is for vigilance and effective lease management of Minor mineral Quarries. The objective of Drone survey is to curb illegal mining in Quarries by establishing a base line and periodic drone survey data for scientific assessment of mineral quantity

Highlights:

- Currently, All minor mineral quarry's in the state are being surveyed using drone and DGPS survey.
- Drone survey is being carried out in the presence of quarry owners and district DMG officials to ensure transparency.
- DGPS survey of corner points of the block is also carried out to resolve boundary disputes, if any. This activity includes comparison of grant sketch area and physical possession area to finalise the actual boundary of the lease as one time measure.

Outcomes :

- As on Dec 2023, survey activities in the ground are completed in 13 districts and data processing is in progress.
- **Enhanced Safety:** Drones can access hazardous areas without putting human surveyors at risk. This minimizes exposure to dangerous conditions such as unstable rock faces or steep terrains, significantly improving overall safety during site assessments
- **Rapid Surveying & Mapping:** Drone surveys can cover large areas quickly compared to traditional methods, drastically reducing the time required for data collection.

Thematic Area: Sustainable Mining Practice

6 Sand Policy, 2020:

It was implemented in response to the increasing shortage of river sand and aims to promote the production and usage of manufactured sand (M-sand).

Highlights:

- The policy grants powers to Gram Panchayats to issue permits for the transportation of sand from local streams for personal consumption.
- Regulated pricing: This pricing structure is intended to make sand more affordable and reduce illegal mining activities by providing a legal alternative
- Karnataka Minor Mineral Concession Rules,1994 Amendment Rules 2023, Rule 31-ZC (Special provisions for M-sand) has been amended to promote M-sand production in the state.
- The persons/firm/companies who already have established M-sand crusher unit will be given opportunity to grant quarry lease in Government land within 30 kilometers radius from the crusher unit without going through E-auction.

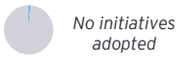
Outcomes :

- Total sand production over the last 4 years till Nov-24 is around 11.32 million MT. Production in FY'22, FY'23, FY'24, FY'25 (Until Nov-24) is 3.04 million MT, 3.04 million MT, 3.09 million MT, 2.14 million MT respectively.
- Total revenue generated through M-Sand policy over the last 4 years till Nov-24 is around Rs. 3,192 cr. Revenues in FY'22, FY'23, FY'24, FY'25 (Until Nov-24) is Rs. 683 cr, 970 cr, 1,016 cr and 523 cr respectively.
- Decentralization by empowering gram panchayats aims to streamline the process and make it more accessible for local communities
- This pricing structure is intended to make sand more affordable for local people in village and therefore price for sand sold through Gram Panchayats is fixed at ₹300 per metric tonne in 2024

Summary of Initiatives & Recommendations - Karnataka (1/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Karnataka						



S.No.	Initiative adopted	Impact from adoption of Initiative
1	Integrated Lease Management System (ILMS)	▪ This FY 2022-2023, the state collected Rs 5946 crore revenue (the state's revenue target for the full year is Rs 6,500 crore), achieving 91.5% of the target. ▪ 1,09,50,000 e-permits issued and 4500 Lessee registered through the ILMS portal adoption ▪ Total revenue generated through ILMS portal over the last 5 years is around Rs. 25,178 cr. Revenues in 2020, 2021, 2022, 2023, 2024 is Rs. 3,629 cr, 3,893 cr, 5,343 cr, 5389 cr and 6,924 cr respectively.
2	One State One GPS (OSOG)	▪ 56,300 mineral carrying vehicles are currently covered by One State One GPS platform ▪ Approximately 4,000 mineral carrying vehicles are still to be covered under One State One GPS platform ▪ It can help in curbing illegal transportation as well as maintaining transparency in mineral trade. ▪ Facilitates better decision-making and efficient resource allocation by consolidating relevant information in one place.
3	Modern Check post and interstate border checks	▪ Reduction in paperwork, speeds up processing times, and enhances transparency in the transportation of minerals. ▪ Enables authorities to identify irregularities or potential illegal activities, allowing for proactive enforcement of mining regulations. ▪ This feature ensures that mining operations comply with environmental regulations, contributing to sustainable practices in the industry
4	Integrated Centralized DMF web portal	▪ Centralization improves information availability for stakeholders ▪ Enhancement in transparency by allowing users to track how DMF funds are collected and utilized. ▪ Improved accessibility, due to user friendly interface ensures effectively utilization of the available resources & data by relevant stakeholders
5	Drone survey of Quarries	▪ As on Dec 2023, survey activities in the ground are completed in 13 districts and data processing is in progress. ▪ Enhanced Safety: Drones can access hazardous areas without putting human surveyors at risk. ▪ Rapid Surveying & Mapping: Drone surveys can cover large areas quickly compared to traditional methods, drastically reducing the time required for data collection.
6	Sand policy, 2020	▪ Total sand production over the last 4 years till Nov-24 is around 11.32 million MT. Production in FY'22, FY'23, FY'24, FY'25 (Until Nov-24) is 3.04 million MT, 3.04 million MT, 3.09 million MT, 2.14 million MT respectively. ▪ Total revenue generated through M-Sand policy over the last 4 years till Nov-24 is around Rs. 3,192 cr. Revenues in FY'22, FY'23, FY'24, FY'25 (Until Nov-24) is Rs. 683 cr, 970 cr, 1,016 cr and 523 cr respectively. ▪ Decentralization by empowering gram panchayats aims to streamline the process and make it more accessible for local communities ▪ This pricing structure is intended to make sand more affordable for local people in village and therefore price for sand sold through Gram Panchayats is fixed at ₹300 per metric tonne in 2024

Summary of Initiatives & Recommendations -Karnataka (2/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Karnataka						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Mineral Administration and Mineral Concession	▪ Other states have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	▪ Other states have been actively pursuing initiatives: ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Sustainable Mining Practices	▪ Other states have adopted other initiatives: ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development
Technology, research and development	▪ Other states have adopted other initiatives: ▪ Mine Surveillance system ▪ E-Check gate implementation ▪ Sand Mine Portal ▪ These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.
Social project implementation	▪ Other states have adopted other initiatives: ▪ Mines and Mineral Restoration and Rehabilitation Fund ▪ Upgradation of Healthcare services ▪ These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .
Mine closure, waste management , reclamation and rehabilitation	▪ Other states have adopted the initiatives: ▪ Management of Abandoned mines ▪ Dumping of Overburden and waste outside the lease area for Minor minerals ▪ These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.
Skilling and Capacity Building	▪ Other states have adopted the initiatives: ▪ Human Resource Development ▪ This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

For more information, visit the following website: Department of Mines and Geology - Index

5.4 State-wise initiatives and outcomes

12. Kerala

Kerala Mineral Scenario

- Kerala's mineral resources, although not as extensive as those of other states such as Rajasthan or Odisha, play an important role in key sectors such as construction, manufacturing, and heavy industry.
- The mining sector in Kerala is particularly known for the extraction of non-metallic minerals, with a few significant metallic minerals also contributing to its economic activities
- The mineral wealth of Kerala is mainly concentrated along its coastal areas and in the hilly regions of the Western Ghats, which are home to deposits of various minerals such as ilmenite, bauxite, limestone, and granite.

What's going on so far...

- Although Kerala's mining sector is not as large-scale as those in other Indian states, it still makes a vital contribution to the economy, especially in supporting construction activities, infrastructure projects, and mineral-based industries.
- The state also boasts a significant granite industry, with deposits of high-quality granite used for both domestic consumption and export purposes. However, despite these resources, the mining sector in Kerala faces several challenges, including environmental concerns related to deforestation, land degradation, and water scarcity

Best Practices adopted by Kerala

Thematic Area: Mineral Administration

1 Permit issuing authority:

The Department of Mining and Geology is the only Department authorised to issue Quarrying permits/Leases, Movement permits, Dealers Licences and Mineral transit passes in all cases except the Mineral transit passes for the removal of ordinary earth from places of construction of a building having area up to 3000 Sqft.

Highlights:

- There is a District squad under the Department of Mining and Geology in each district to prevent illegal mining and transportation and also for Redressal of complaints.
- By regulating the issuance of permits, the authority helps ensure that all mining activities are documented and monitored
- The Permit Issuing Authority simplifies the process of obtaining permits for mining activities.

Outcomes :

- This streamlining and simplification of processes reduces bureaucratic delays, making it easier for miners to start operations promptly and efficiently.
- Mitigation of illegal mining activities and promotion of sustainable practices.
- Facilitation of better data collection regarding mining activities, including the types of minerals extracted and their quantities.

2 Relaxation for digging foundations

No quarrying permit or quarrying lease is required for extraction of ordinary earth in connection with the construction or digging of the foundation for the building not requiring environmental clearance under the Environment (Protection) Act, 1986, if the owner of the land obtained prior valid permit for construction of such building from LSG authorities.

Highlights:

- As per Kerala Minor Mineral Concession Rules, 2015, no quarrying permit is required under the rules for the extraction of ordinary earth in connection with the construction and digging of foundations for building that do not require environmental clearance under the Environment (Protection) Act, 1986 (Central act 29 of 1986), if the owner of the land obtained a prior valid building permit from the Local Self Government authorities concerned.
- No volume or depth threshold is fixed for foundation digging. However, it is insisted that the plan issued under Kerala Panchayath Building Rules, 2019 shall contain the precise area proposed for the extraction of ordinary earth with demarcation details. The precise area shall not exceed the sum of the plinth area of the ground floor, the open space around the building as per the Building Rules, and the space required for implementing safety provisions, including the driveaway.
- In the case of the construction of residential buildings or common facilities like public wells, public libraries, reading rooms, recognised educational institutions, temples, churches, mosques etc, where extraction of minor minerals is inevitable for the construction, the person doing such work is exempted from obtaining quarrying permit/lease. However, the person concerned shall inform the competent authority of his intention to carry out the work and also shall furnish necessary documents as required by the competent authority.

Outcomes:

- Enable quicker assessments of soil conditions before excavation begins. This can help avoid delays in project timelines.
- Reduction in administrative bottlenecks and expedites the commencement of construction projects.
- Enhancement of resource efficiency

Source: State Ministry information received and secondary research

3 Vigilance and Monitoring Committee

The Government had constituted three level Monitoring Committees to check illegal mining. (State Level Monitoring, District Level Vigilance & Divisional Level Vigilance)

Highlights:

- State Level Monitoring Committee under the Chairmanship of Principal Secretary (Industries)- will examine the policy aspects with regard to mining.
- District Level Vigilance & Monitoring Committee under the Chairmanship of District Collector-will observe the working of Divisional level committee.
- Divisional Level Vigilance & Monitoring Committee under the Chairmanship of Revenue Divisional Officer - will visit the quarries, redress complaints.
- The officers of Land Revenue, Local Self Government, Mining and Geology department and Kerala Pollution Control Board are members on all the three level Committees.
- A joint team consisting of officials from Departments of Police, Motor Vehicles and Mining and Geology conduct frequent surprise checks to prevent illegal transportation of minerals and also to check overloaded vehicles carrying minerals.

Outcomes :

- Improved Monitoring of Fund utilization: The VMC can effectively track the flow of funds from allocation to utilization across different levels. This monitoring helps identify discrepancies or delays in fund disbursement
- Enhanced Oversight and Accountability: The multi-tiered structure allows for comprehensive oversight of programs at various administrative levels. This ensures that officials are held accountable for their actions, reducing the likelihood of corruption and mismanagement of funds.
- Coordination Across Levels: The three-level structure promotes better coordination between state, district, and divisional authorities. This collaboration enhances the effectiveness of program implementation by ensuring that all levels work towards common objectives.

Thematic Area: Technology, research and development

4 Application of Drone Technology to prevent illegal Mining – Kerala Mineral Drone LiDAR Survey (KMDL)

The Kerala Mineral Drone LiDAR Survey (KMDL) Project, was inaugurated on October 24, 2024, in Perumkadavila, Trivandrum by Minister P. Rajeev, is implemented by KELTRON

Highlights:

- Advance calculation of mineable reserve will be made by making use of Drone technology.
- Periodical measurement of working quarry is under consideration apart from the assessment of quarries during the time of submission of Mining Schemes and also quarry closure Plans.
- The drone survey will calculate the amount of minerals that can be legally mined in areas applying for mining permits, as well as the amount of minerals being mined illegally

Outcomes :

- This initiative aims to prevent illegal mining thereby ensuring that mining activities are conducted in compliance with the regulations
- Introduction of such technological innovations would make the operations of the department more transparent and systematic
- Rapid data collection allows mining companies to obtain critical information quickly, enabling timely decision-making and operational adjustments
- Equipped with advanced sensors, drones capture high-resolution images and precise topographic data, resulting in more accurate and detailed 3D models of mining sites.

The Kerala Mineral Drone LiDAR Survey (KMDL) Project, inaugurated on October 24, 2024, in Perumkadavila, Trivandrum by Minister P. Rajeev, is implemented by KELTRON and uses advanced GIS, LiDAR, drone mapping, and bathymetric surveys to enhance mineral resource management, promoting transparency, efficiency, and sustainability in Kerala's mining sector.

5 Kerala Online Mining Permit Awarding Services (KOMPAS)

It is the e-Governance initiative of the Department of Mining and Geology for bringing efficiency and transparency to mineral administration in the State.

Highlights:

- Used for issuing movement permits, collection of royalty, compliance of mining plan, generating reports and returns.
- Integrated with Google maps and Google Earth.
- Equipped with GIS capabilities.
- Location, shape and area of mines are checked using KOMPAS
- Monitors validity of mineral concession as well as other statutory licences.
- KOMPAS provides fast and timely service to the public.
- In addition to the Department of Mining and Geology, the officials of the Revenue Department and Police can check illegal transport. They can check the genuineness of e-pass through the Portal/KOMPAS app.

Outcomes: (As on 20th December, 2024)

- 1,844 e-Movement permits issued
- 74,139 vehicles enrolled
- 3,41,72,789 – Total e-Passes issued
- It ensures efficiency & transparency,
- Automated checks and documentation help maintain compliance with safety and environmental standards, reducing the risk of legal issues and promoting responsible mining practices.

Thematic Area: Mine Closure, Reclamation & Rehabilitation

6 Management of abandoned mines:

Abandoned mines are used in the state for various activities. Some of the activities are Cultivating vegetables, Pisciculture and water storage for agriculture purposes.

Highlights:

- The Kerala government has undertaken efforts to identify and assess abandoned mine sites. This includes evaluating the environmental impact and the extent of reclamation needed for each site.
- Some of the activities for which the abandoned mines are used are cultivating vegetables, Pisciculture and water storage for agricultural purposes

Outcomes :

- Educational initiatives are conducted to raise public awareness about the issues associated with abandoned mines, including their environmental impact and potential health hazards. These campaigns aim to enhance the information of communities about the importance of sustainable practices in mining.
- Mitigation of the ecological damage caused by mining activities.
- By addressing hazards associated with abandoned mines, such as unstable structures and contaminated land, the management efforts enhance public safety.

Thematic Area: Waste Management

7 Dumping of OB and waste outside lease area

In order to prevent wastage of overburden and to utilise the same during quarry closure, a provision is laid down in KMMC Rules to remove and store the same outside lease area

Highlights:

- The state has established a regulatory framework governing the dumping of OB and waste, which includes strict compliance with waste management laws.
- The state is investing in infrastructure to manage waste more effectively, including the development of regional treatment facilities for solid waste.
- The management approach encourages community involvement in monitoring activities related to waste dumping.
- Periodical inspection is conducted to ensure management of overburden

Outcomes :

- Enforces responsible waste disposal practices
- This infrastructure aims to reduce the reliance on dumping by providing safer alternatives for waste processing and disposal

Summary of Initiatives & Recommendations - Kerala (1/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Kerala						

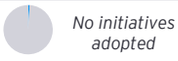
 No initiatives adopted
 *0-25% initiatives adopted*
 *25-50% initiatives adopted*
 *50-75% initiatives adopted*
 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1.	Permit issuing authority	▪ This streamlining and simplification of processes reduces bureaucratic delays, making it easier for miners to start operations promptly and efficiently. ▪ Mitigation of illegal mining activities and promotion of sustainable practices. ▪ Facilitation of better data collection regarding mining activities, including the types of minerals extracted and their quantities.
2.	Relaxation for digging foundations	▪ Enable quicker assessments of soil conditions before excavation begins. This can help avoid delays in project timelines. ▪ Reduction in administrative bottlenecks and expedites the commencement of construction projects. ▪ Enhancement of resource efficiency
3.	Vigilance and Monitoring Committee	▪ Improved Monitoring of Fund utilization: The VMC can effectively track the flow of funds from allocation to utilization across different levels. ▪ Enhanced Oversight and Accountability: The multi-tiered structure allows for comprehensive oversight of programs at various administrative levels. ▪ Coordination Across Levels: This three-level structure enhances the collaboration which enhances the effectiveness of program implementation by ensuring that all levels work towards common objectives.
4.	Drone Technology to prevent illegal Mining	▪ This initiative aims to prevent illegal mining thereby ensuring that mining activities are conducted in compliance with the regulations ▪ Introduction of such technological innovations would make the operations of the department more transparent and systematic ▪ Rapid data collection allows mining companies to obtain critical information quickly, enabling timely decision-making and operational adjustments ▪ Equipped with advanced sensors, drones capture high-resolution images and precise topographic data, resulting in more accurate and detailed 3D models of mining sites.
5.	Kerala Online Mining Permit Awarding Services (KOMPAS)	▪ 1,844 e-Movement permits issued (As on 20th Dec, 2024) ▪ 74,139 vehicles enrolled (As on 20th Dec, 2024) ▪ 3,41,72,789 – Total e-Passes issued (As on 20th Dec, 2024) ▪ It ensures efficiency & transparency, ▪ Automated checks and documentation help maintain compliance with safety and environmental standards, reducing the risk of legal issues and promoting responsible mining practices.
6.	Management of abandoned mines	▪ Educational initiatives are conducted with the aim to enhance the information of communities about the importance of sustainable practices in mining. ▪ Mitigation of the ecological damage caused by mining activities. ▪ By addressing hazards associated with abandoned mines, such as unstable structures and contaminated land, the management efforts enhance public safety.
7.	Dumping of OB and waste outside lease area	▪ Enforces responsible waste disposal practices ▪ This infrastructure aims to reduce the reliance on dumping by providing safer alternatives for waste processing and disposal

Summary of Initiatives & Recommendations - Kerala (2/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Kerala						



Recommendation

Mineral Administration and Mineral Concession	▪ Other states have have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
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Sustainable Mining Practices	▪ Other states have have adopted other initiatives: ▪ M-Sand Policy ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development
Technology, research and development	▪ Other states have have adopted other initiatives: ▪ Mine Surveillance system ▪ E-Check gate implementation ▪ Sand Mine Portal ▪ These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.
Social project implementation	▪ Other states have have adopted other initiatives: ▪ DMF Portal ▪ Mines and Mineral Restoration and Rehabilitation Fund ▪ Upgradation of Healthcare services ▪ These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .
Skilling and Capacity Building	▪ Other states have adopted the initiatives: ▪ Human Resource Development ▪ This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

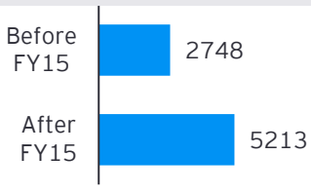
For more information, visit the following website: *Department of Mining and Geology – Government of Kerala*

5.4 State-wise initiatives and outcomes

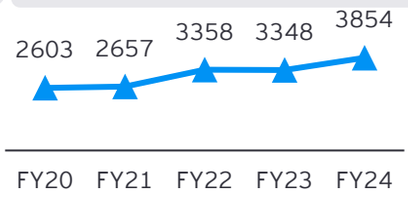
13. Madhya Pradesh

KPIs so far....

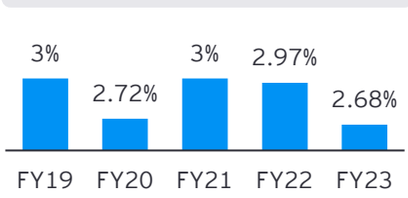
(Revenue Pre & Post Auction), INR Cr



Value of mineral production, INR Cr



Mining contribution (%) to State GDP



Madhya Pradesh Mineral Scenario

- Madhya Pradesh (MP) holds a strategic position in India's mining sector, offering a diverse array of valuable minerals that contribute significantly to the state's economic growth. As one of the top mineral-rich states in the country, MP's mining industry is key not only for its domestic needs but also plays a vital role in global mineral supply chains. The state is endowed with significant deposits of coal, limestone, copper, manganese, and bauxite, as well as precious minerals such as diamond
- MP is unique in that it is the only state in India that produces diamonds, with the Panna diamond mine being a notable source, producing around 100,000 carats annually.

What's going on so far...

- Madhya Pradesh is positioning itself as a leader in the mining sector through several initiatives aimed at improving the mineral extraction process and fostering sustainable development.
- The state is working on increasing the efficiency of its mining operations through the adoption of modern technologies like AI and machine learning, which are expected to enhance the quality and productivity of mining activities
- To further promote mineral development, MP has taken several strategic steps. These include policy incentives for private sector participation, especially in exploration and mining of diamonds, gold, and other precious minerals.

Best Practices adopted by Madhya Pradesh

Thematic Area: Mineral Administration

1 Inter-Departmental Collaboration for Auction Approval:

Inter-departmental collaboration for auction approval offers several significant benefits that enhance efficiency, transparency, and overall effectiveness in the process.

Highlights:

- Technical Evaluation & Tender Approval Committee (TETAC): A multi-disciplinary, inter-departmental committee (TETAC) has been set up, including representatives from Forest, Law, and other departments, to approve auction of identified mineral blocks.
- Coordination for Compliance: Close coordination with the Geological Survey of India (GSI) and Mineral Exploration Corporation Limited (MECL) ensures that Geological Reports are in compliance with Mineral (Evidence of Mineral Contents) Rules, 2015.

Outcomes :

- MP auctioned highest blocks (78) amongst all the states between FY'15 to FY'24
- In FY'23-24, 22 mineral blocks were auctioned, which is projected to generate around ₹38,100 crore
- Improved Efficiency and Reduced Delays: Collaboration among various departments streamlines the auction approval process.

2 Streamlined exploration & operationalization:

It focus on optimizing processes to accelerate resource identification and efficient project execution. By leveraging advanced technologies and robust planning, it ensures minimal delays and maximized output while adhering to sustainability and safety standards

Highlights:

- District and HO Collaboration: Active collaboration between various districts and headquarters through periodic reviews to monitor exploration activities and operationalization of mineral blocks.
- Focused Exploration Efforts: Increased emphasis on exploration activities to prepare a pipeline of future mineral blocks.

Outcomes :

- **Streamlined processes** lead to faster outcomes, which can enhance satisfaction among stakeholders, including bidders and local communities affected by mining operations.
- Increased Supplier engagement, by involving suppliers early in the exploration and operationalization phases, companies can foster more collaborative relationships.

Source: State Ministry information received and secondary research

3 Facilitating Compensatory Afforestation:

Involves identifying suitable land and ensuring the timely plantation of trees to offset environmental impacts of land use changes. This process promotes ecological balance, biodiversity conservation, and compliance with forest conservation policies.

Highlights:

- Availability of Land Banks: The Revenue Department of Government of Madhya Pradesh has significant land banks that can be made available to preferred bidders for compensatory afforestation, supporting environmental sustainability.
- Monitoring and Maintenance: Establishing systems for regular monitoring, survival rate assessments, and long-term maintenance of planted areas to ensure the success of afforestation efforts

Outcomes :

- Community Engagement, engaging local communities in afforestation efforts
- Contribution to long term sustainability national goals
- Improved relationships with regulatory bodies by demonstrating compliance & proactive environmental management

4 Proactive review and support for bidders:

This focus on providing timely guidance, clarifications, and resources to ensure a seamless bidding process. This includes assessing bid submissions for compliance, addressing queries promptly, and offering assistance to enhance bidder confidence and participation

Highlights:

- The progress of operationalization of auctioned blocks is reviewed periodically at the highest level.
- Further, an inter-departmental committee (MRD order Dt. 02nd Aug 2024) headed by the Principal Secretary, Mineral Resources Department, Government of Madhya Pradesh and comprising of representatives from Forest Dept, Revenue Dept and Environmental Dept. is in place that periodically reviews the progress

Outcomes :

- Increased auctionability rate
- Decrease statutory clearance time
- High premium on pre- embedded clearance blocks
- Less gestation period

5 Pre embedded Clearance:

It ensures that critical approvals and permissions, such as environmental and land clearances, are obtained in advance by the authorities. This reduces procedural delays, simplifies the bidding process, and enhances project readiness for immediate operationalization.

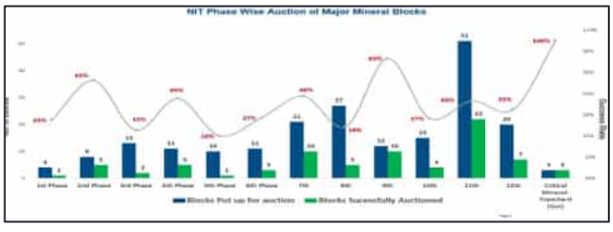
Highlights:

- The Directorate of Geology & Mining has signed an MoU with Madhya Pradesh State Mining Corporation Limited (MPSMCL) for obtaining statutory clearances including Mining Plan Approval, Forest Clearance-I, Environmental Clearance for blocks to be put up for auction.
- Out of 4 blocks (Dadartola Dadar Bauxite Block, Gudha Limestone Block, Muariya Base metal Block, Jariyari Bauxite Block) blocks given to MPSMCL, 2 blocks (Gudha Limestone Block, Muariya Base Metal Block) will be available for auction by Aug 2025 and the remaining 2 blocks to be put up for auction in Dec 2025

Outcomes :

- Improved Business environment by promoting ease of doing business
- Reducing bureaucratic delays fosters positive perceptions among stakeholders, including local communities and businesses
- Predictable Operations: With clearances secured beforehand, companies can engage in long-term planning for resource extraction and management

Success Rate of Auctioned Major Mineral Blocks in Madhya Pradesh



6 Auction and operationalization of Sand mines:

Auction and operationalization of Sand mines in Madhya Pradesh regulated through Sand (Mining, Transportation, Storage and Trade) Rules 2019

Highlights:

- Mines allocated to the Madhya Pradesh State Mining Corporation Limited (MPSMCL) for a duration of 10 years.
- MPSMCL is tasked with obtaining all necessary statutory clearances (Mining Plan, Environmental Clearance, CTO, etc.).
- All available sand mines in the districts are grouped and auctioned through a single/multiple tender depending upon the auctioned quantity.

Outcomes:

- Revenue: Successfully auctioned 40 sand clusters. Increase in revenue from INR 887 Cr in FY 2022-23 to INR 1243 Cr in FY 2023-24
- Sand Mine Groups: Total 44 sand clusters having 1171 sand mines at present
- Availability: 3.60 Cr. Cu.m of sand quantity available
- Active participation by the bidders in e-Auction of sand mine groups and Sustained availability of sand to general public as well as for construction projects

Thematic Area: Technology, research and development

7 E-Check Gate Implementation:

i. The E-Check Gate system is being implemented by RailTel Corporation, ensures real-time monitoring of mineral transportation

ii. State-level Control and Command Center, along with a District Command Center in Bhopal, has been established and operations have commenced

iii. Under the pilot project, I-check gates have been installed at four locations (Eitkhedi, Neelbadh, Bangarsia, Obaidullaganj) in Bhopal district, with plans to complete installation of additional 37 location by December 2024 in Bhopal, has been established and operations have commenced.

Highlights:

- Field officers can conduct on-the-spot inspections with handheld devices, while a web app handles audits, e-TP validation, and e-notice issuance.
- The system also triggers real-time alerts via a mobile app, streamlining communication with all stakeholders.

Outcomes :

- Enhanced Asset Tracking and management is ensured by RFID technology by attaching RFID tags to equipment and vehicles
- Improved Security and theft prevention along with streamlined supply chain management

State Command and Control Center

E-Check Gate Technology Setup

8 Satellite based Mining Surveillance System:

Leverages advanced remote sensing technology to monitor mining activities in real-time, ensuring transparency and regulatory compliance.

Highlights:

- **Real-Time Monitoring:** Utilizes satellite imagery to track mining activities in near real-time, ensuring continuous oversight and minimizing the chances of illegal mining operations.
- **Detection of Unauthorized Activities:** Identifies deviations from approved mining plans, such as unauthorized land use or over-extraction, enabling swift corrective actions.
- **Environmental Impact Assessment:** Supports the evaluation of mining-induced environmental changes, including deforestation and land degradation, aiding in the formulation of mitigation strategies.

Outcomes :

- Geofencing has been successfully completed for 7000 mines
- Enhanced Operational Efficiency: Satellite-based mining surveillance systems provide real-time monitoring of mining operations, allowing companies to track progress, identify inefficiencies, and make informed decisions quickly.
- Improved Transparency and Accountability: Satellite imagery promotes transparency in mining operations by providing unbiased data that can be shared with stakeholders, including local communities and regulatory agencies.

9 Mining Plan Approval System:

It streamlines the evaluation and approval of mining plans, ensuring alignment with regulatory and environmental standards. It enhances efficiency by digitizing processes, reducing approval timelines, and fostering transparency in mining operations

Highlights:

- The Mining Plan Approval System (MPAS) streamlines online RQP registration, mining plan submissions, and approvals
- MPAS enables real-time tracking of mining plans and sends alerts for delayed approvals, ensuring transparency and timely processing.
- Structured Review Process: The system mandates a structured review process for mining plans, where submissions are scrutinized by qualified professionals.

Outcomes :

- 400 mining plans processed since June'23
- Regulatory Compliance: Mining Plan Approval Systems ensure that all mining operations comply with legal and environmental regulations
- Transparency and Accountability: The system fosters transparency by mandating thorough documentation and review processes.

10 Drone Survey & Volumetric Analysis:

Drone Survey and Volumetric Analysis utilize advanced UAV technology to capture high-resolution aerial data for precise mapping and measurement of mining sites. This approach enables accurate calculation of extracted volumes, improves operational efficiency, and supports better resource planning.

Highlights:

- Drone survey & volumetric analysis with the data thoroughly analyzed for accuracy and insights
- High-Resolution Data Collection: Drone surveys provide exceptionally high-resolution imagery and detailed 3D models of mining sites, significantly enhancing the accuracy of volumetric analysis and enabling precise measurements of stockpiles and excavation areas.
- Rapid Data Acquisition: Drones can collect data up to 30 times faster than conventional land-based surveying techniques. This quick turnaround allows mining companies to obtain critical information more efficiently, reducing downtime and accelerating project timelines

Outcomes:

- Drone survey and volumetric analysis conducted at 130 stockyards
- Rapid Data Collection: This allows mining operations to obtain critical information quickly, significantly reducing project timelines and enhancing overall efficiency
- Cost-Effectiveness: Implementing drone technology in mining operations is often more cost-effective than traditional surveying techniques. Drones reduce labor costs and resource expenditures while delivering high-quality results, making them a financially advantageous option for mining companies

11 E-khanij:

E-Khanij is an online platform developed by the Government of Madhya Pradesh to streamline and enhance the management of mineral resources in the state.

Highlights:

- E- khanij application is live since October 2016.
- Lessee registration process is carried out on the e-khanij platform
- Vehicle registration process is completed through the portal and has been integrated with VAHAN portal.
- Electronic Transit Passes (ETPs) ae generated online. Production and Dispatch details are recorded online through the e-khanij portal
- MIS and reports are generated for informed decision and strategic planning

Outcomes: (From April'17 till present)

- 5.07 Cr. ETP have been issued
- 7,371 Quarry Lease are Operational
- 508 mining leases are operational
- 3,771 stock licenses are operational
- 11,126 users have been onboarded
- 4,500 Quarry Permits are operational

12 Sand Mine Portal:

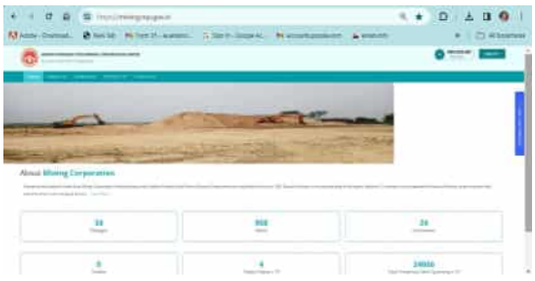
The Sand Mining Portal developed by the Government of Madhya Pradesh serves as an online platform to regulate and manage the extraction and distribution of sand within the state.

Highlights:

- Entire activity from onboarding of Sand Mines Group to issuance of e-Transit pass is computerized.
- All sand mines, Statutory Clearances, Validity of clearances are online on a single platform.
- Real time status of Sand being extracted, transported form the mine vis.-a-vis. Quantity as per statutory clearances
- Real time tracking of dues of the MDO, automatic stoppage of e-TP.
- Management of Sand Stocks- approval, mineral register management.

Outcomes:

- Ease of Access and Convenience: The portal allows users to apply for sand mining licenses and permits online, streamlining the process and reducing bureaucratic delays.
- Transparency and Accountability: The Sand Mining Portal promotes transparency in the sand mining process by providing real-time data on sand availability, pricing, and regulatory compliance.
- Monitoring and Regulation: The portal enhances the government's ability to monitor sand extraction activities effectively.



Thematic Area: Social Project Implementation

13 District Mineral Foundation:

Establish a Project Management Unit (PMU) to oversee DMF/PMKKKY initiatives, develop mechanism for tracking fund collection and utilization, conduct studies, oversee the implementation of the approved projects, develop reporting & monitoring frameworks

Highlights:

- Creation of State level DMF portal to increase transparency, focus on convergence with ongoing work and to avoid non-repetitions of works
- PMU personnel deployed at Singrauli, Anuppur, Katni, Betul, Chhindwara, Balaghat, and Shahdol (top DMF collection districts) to better monitor the work and participate in DMF meetings at the local level
- An Expert – Finance has been appointed as part of the DMF PMU for managing funds, utilization of funds and yearly audits

Outcomes:

- Participatory Planning: The DMF encourages a bottom-up planning approach, involving local communities in decision-making processes regarding fund allocation. This participatory framework ensures that the projects funded align with the actual needs and priorities of the affected populations
- Sustainable Livelihoods: One of the primary objectives of the DMF is to promote long-term sustainable livelihoods for individuals impacted by mining operations.
- Total DMF collection: Rs.7755 Cr. (Sept'24)
- Allocation of amount: Rs. 4406 Cr.
- Total no. of projects sanctioned: 16,452
- Total no. of projects completed: 7,582

Thematic Area: Exploration & Mine Development

14 Collaborative Exploration projects with PSUs:

MOIL, DGM, and MPSMCL signed a Memorandum of Understanding (MoU) whereby MOIL will conduct exploration for Manganese ore in Madhya Pradesh at its own expense. If commercially viable reserves are found, a Joint Venture (JV) shall be formed, and application to reserve the block in the name of said JV will be submitted.

Highlights:

MOIL has carried out exploration for Manganese in four districts—Chhindwara, Balaghat, Jabalpur, and Jhabua- with commercially viable findings in Chhindwara and Balaghat district (Bhudkum and Selwa Blocks)

A Joint Venture agreement was executed on 18th Oct 2024, during the Madhya Pradesh Mining Conclave, 2024.

Outcomes :

- 64 exploration blocks of critical and major minerals are under exploration within the state, which is the highest in the country.
- Exploration activities will be completed in 62 blocks at the end of the year.
- Out of 64, 39 blocks are of G4 category and 25 are of G3 category
- Emphasis is on exploration of more G3 blocks to provide geological data with a higher confidence level to increase the auctionability of the blocks.

15. MoU with Madhya Pradesh State Mining Corporation (MPSMCL):

Directorate of Geology & Mines Madhya Pradesh has executed an MoU with MPSMCL for conducting exploration within the state.

Highlights:

Mineral Resources Department, Govt. of Madhya Pradesh has taken the initiative of compiling available geological data from all the possible sources to develop a State Geological Data Repository portal. Online monitoring of all the ongoing exploration projects shall also be taken up through this portal. Its development is currently under process

Outcomes :

- Additional 58 blocks have been given to MPSMCL for exploration
- MPSMCL being Notified exploration agency started exploration in 8 blocks through NMET

Exploration Highlights: Status of ongoing exploration projects in Madhya Pradesh (64 blocks)

Exploration Agency	District	No. of Blocks	Commodity
Geological Survey of India (GSI)	Jhabua, Betul, Chhindwara, Neemuch, Gwalior, Damoh, Dindori, Bhind, Umaria, Shahdol, Shivpuri, Sidhi, Singrauli, Jabalpur, Katni, Balaghat, Chhatarpur, Panna	37 G3-12 | G4-25	Basemetal (7), Limestone (7), Iron Ore (4), Critical (1), REE (4), Glauconite (2), Bauxite (7), Gold (2), Ni Cr (1), Manganese (1), Copper Graphite (1)
Mineral Exploration and Consultancy Ltd. (MECL)	Balaghat, Chhatarpur, Katni, Sidhi, Jabalpur and Satna	12 G3-6 | G4-6	Copper(1), Manganese(1), REE (1), Graphite & Gold (1), Diamond (2), Iron and Manganese (2), Iron (2), Manganese and Glauconite (2)
Notified Private Exploration Agencies (NPEA)*	Balaghat and Betul	03 G4-3	PGE, Gold & REE (1), Vanadium(1) and Graphite (1)
MP State Mining Corporation Limited (MPSMCL)	Chhatarpur, Satna, Panna, Jhabua and Betul	07 G3-3 | G4-4	Limestone (4), Phosphorite (1), Graphite (1), Lead, Zinc and Copper (1)
MP Directorate of Geology and Mining (DGM)	Dindori, Damoh, Satna and Neemuch	05 G3-4 | G4-1	Limestone (3), Bauxite (1) and Glauconite (1)

- Exploration of 62 blocks out of 64 is scheduled to be completed this year 2024-25
- Exploration of 2 blocks of NPEA (Manori Sirapala, Bhursadongari Murum) will be completed in next financial year.

Thematic Area: Waste Management

16 Waste Management initiatives :

Highlights:

- Provisions are in place for the efficient utilization of mineral by-products. Overburden from limestone and coal can be processed into M-sand, in consultation with the Indian Bureau of Mines (IBM)
- Marble rejects serve as an alternative to dolomite in putty plants, while flagstone rejects are repurposed as filling material, promoting waste reduction and resource efficiency.

Summary of Initiatives & Recommendations - MP (1/3)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Madhya Pradesh						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

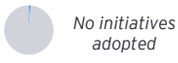
 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1	Inter-Departmental Collaboration for Auction Approval	▪ MP auctioned highest blocks (78) amongst all the states between FY'15 to FY'24 ▪ In FY'23-24, 22 mineral blocks were auctioned, which is projected to generate around ₹38,100 crore ▪ Improved Efficiency and Reduced Delays: Collaboration among various departments streamlines the auction approval process.
2	Streamlined exploration & operationalization	▪ Streamlined processes lead to faster outcomes, which can enhance satisfaction among stakeholders ▪ Increased Supplier engagement, by involving suppliers early in the exploration and operationalization phases, companies can foster more collaborative relationships.
3	Facilitating Compensatory Afforestation:	▪ Community Engagement, engaging local communities in afforestation efforts ▪ Contribution to long term sustainability national goals ▪ Improved relationships with regulatory bodies by demonstrating compliance & proactive environmental management
4	Proactive review and support for bidders	▪ Increased auctionability rate ▪ Decrease statutory clearance time ▪ High premium on pre- embedded clearance blocks ▪ Less gestation period
5	Pre embedded Clearance	▪ Improved Business environment by promoting ease of doing business ▪ Reducing bureaucratic delays fosters positive perceptions among stakeholders, including local communities and businesses ▪ Predictable Operations: With clearances secured beforehand, companies can engage in long-term planning for resource extraction and management
6	E-Check Gate Implementation	▪ Enhanced Asset Tracking and management is ensured by RFID technology by attaching RFID tags to equipment and vehicles ▪ Improved Security and theft prevention along with streamlined supply chain management
7	Satellite based Mining Surveillance System	▪ Geofencing has been successfully completed for 7000 mines ▪ Enhanced Operational Efficiency: Satellite-based mining surveillance systems provide real-time monitoring of mining operations, allowing companies to make informed decisions quickly. ▪ Improved Transparency and Accountability: Satellite imagery promotes transparency in mining operations by providing unbiased data that can be shared with stakeholders, including local communities and regulatory agencies.
8	Mining Plan Approval System	▪ 400 mining plans processed since June'23 ▪ Regulatory Compliance: Mining Plan Approval Systems ensure that all mining operations comply with legal and environmental regulations ▪ Transparency and Accountability: The system fosters transparency by mandating thorough documentation and review processes.
9	Auction and operationalization of Sand mines	▪ Revenue: Successfully auctioned 40 sand clusters. Increase in revenue from INR 887 Cr in FY 2022-23 to INR 1243 Cr in FY 2023-24 ▪ Sand Mine Groups: Total 44 sand clusters having 1171 sand mines at present

Summary of Initiatives & Recommendations - MP (2/3)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Madhya Pradesh						



S.No.	Initiative adopted	Impact from adoption of Initiative
10.	Drone Survey & Volumetric Analysis	▪ Drone survey and volumetric analysis conducted at 130 stockyards ▪ Rapid Data Collection: This allows mining operations to obtain critical information quickly, significantly reducing project timelines and enhancing overall efficiency ▪ Cost-Effectiveness: Drones reduce labor costs and resource expenditures while delivering high-quality results, making them a financially advantageous option for mining companies
11.	E-khanij	▪ (Outcomes from April'17 till present) ▪ 5.07 Cr. ETP have been issued ▪ 7,371 Quarry Lease are Operational ▪ 508 mining leases are operational ▪ 3,771 stock licenses are operational ▪ 11,126 users have been onboarded ▪ 4,500 Quarry Permits are operational
12.	Sand Mine Portal	▪ Ease of Access and Convenience: The portal allows users to apply for sand mining licenses and permits online, streamlining the process and reducing bureaucratic delays. ▪ Transparency and Accountability: The Sand Mining Portal promotes transparency in the sand mining process by providing real-time data on sand availability, pricing, and regulatory compliance. ▪ Monitoring and Regulation: The portal enhances the government's ability to monitor sand extraction activities effectively.
13	District Mineral Foundation	▪ Participatory Planning: The DMF encourages a bottom-up planning approach, involving local communities in decision-making processes regarding fund allocation. ▪ Sustainable Livelihoods: One of the primary objectives of the DMF is to promote long-term sustainable livelihoods for individuals impacted by mining operations. ▪ Total DMF collection: Rs.7755 Cr. (Sept'24) ▪ Allocation of amount: Rs. 4406 Cr. ▪ Total no. of projects sanctioned: 16,452 ▪ Total no. of projects completed: 7,582
14	Collaborative Exploration projects with PSUs	▪ 64 exploration blocks of critical and major minerals are under exploration within the state, which is the highest in the country. ▪ Exploration activities will be completed in 62 blocks at the end of the year. ▪ Out of 64, 39 blocks are of G4 category and 25 are of G3 category ▪ Emphasis is on exploration of more G3 blocks to provide geological data with a higher confidence level to increase the auctionability of the blocks.
15.	MoU with Madhya Pradesh State Mining Corporation (MPSMCL)	▪ Additional 58 blocks have been given to MPSMCL for exploration ▪ MPSMCL being Notified exploration agency started exploration in 8 blocks through NMET
16.	Waste Management Initiatives	▪ Provisions are in place for the efficient utilization of mineral by-products. Overburden from limestone and coal can be processed into M-sand, in consultation with IBM. ▪ Marble rejects serve as an alternative to dolomite in putty plants, while flagstone rejects are repurposed as filling material, promoting waste reduction and resource efficiency.

Summary of Initiatives & Recommendations - MP (3/3)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Madhya Pradesh						

No initiatives adopted | *0-25% initiatives adopted* | *25-50% initiatives adopted* | *50-75% initiatives adopted* | *>75% initiatives adopted*

Recommendation

Exploration and Mines development

- Other states have been actively pursuing initiatives such as
- Digitization, Segregation and Categorization of Past Exploration data/ reports
- Strategic Collaboration for Mineral Resource Mapping
- Establishment of State Mineral exploration trust
- Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation

Sustainable Mining Practices

- Other states have adopted
- M-Sand Policy
- Star Rating of Minor Minerals
- Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development

Social project implementation

- Other states have adopted other initiatives:
- Mines and Mineral Restoration and Rehabilitation Fund
- Upgradation of Healthcare services
- These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Mine closure, waste management , reclamation and rehabilitation

- Other states have adopted the initiatives:
- Management of Abandoned mines
- Dumping of Overburden and waste outside the lease area for Minor minerals
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Skilling and Capacity Building

- Other states have adopted the initiatives:
- Human Resource Development
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

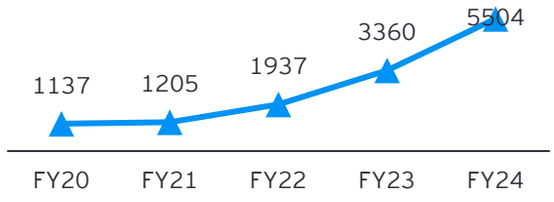
For more information, visit the following website: *e-Khanij:Home Page | Mineral and Resource Department*

5.4 State-wise initiatives and outcomes

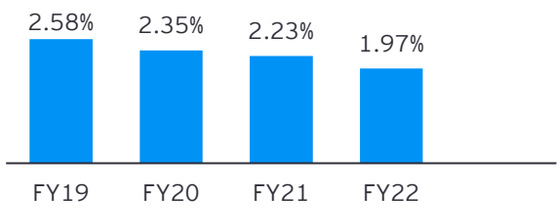
14. Maharashtra

KPIs so far....

Value of mineral production, INR Cr



Mining contribution (%) to State GDP



Maharashtra Mineral Scenario

- Maharashtra, located in western India, is one of the country's most industrialized and economically significant states. The state's mineral resources play a crucial role in supporting its diverse industrial base, ranging from power generation to cement manufacturing, steel production, and various other sectors.
- The state's mineral deposits are spread across several regions, with particular concentration in the Vidarbha, Konkan, and Marathwada areas. .
- The availability of minerals like coal, limestone, bauxite, and manganese supports not only the state's own industries but also the national economy. Additionally, Maharashtra is a leading producer of minerals that fuel critical industries such as electricity generation construction, and metal production.
- The state continues to work on balancing the demand for minerals with sustainable development goals, ensuring that the mineral-rich resources contribute positively to the economy while minimizing their ecological footprint.

What's going on so far...

- The state has successfully auctioned several mineral blocks, ensuring transparency and maximizing revenue generation. To further streamline the process, the state has implemented an Integrated Lease Management System (ILMS), which tracks lease applications, compliance, royalty payments, and environmental obligations in real-time.
- Efforts to monitor and curb illegal mining activities, especially in minor minerals such as sand and granite, have been bolstered through digital interventions like the e-permit system. These initiatives have significantly reduced manual inefficiencies and enhanced governance in the sector.

Best Practices adopted by Maharashtra

Thematic area - Mineral administration

1 **Integrated Lease Management system**

Integrated Lease Management System (ILMS) provides DGM single interface to manage the complete life cycle of the lease management process i.e. reconciliation of payments received with respect to the mines given on lease by the government, the process of issuing royalty pass to the lease-holders and its actual utilization when excavating the minerals.

The ILMS comprise of modules which are used at various operational and functional levels by stake holders & DGM for the integration system & ILMS system ensure which bases the transparency, accuracy, and efficiency in the royalty collection.

Highlights of ILMS 2.0:

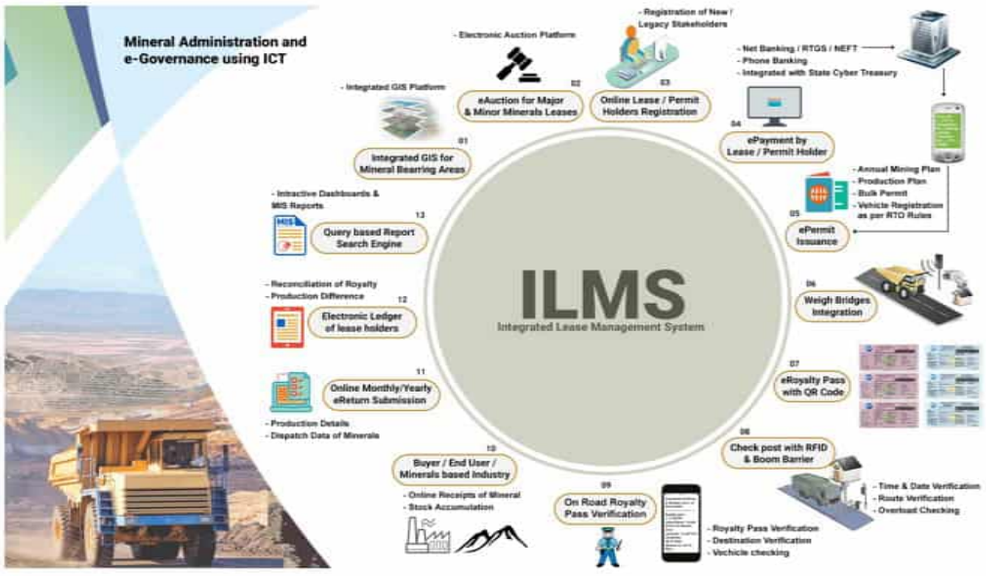
- E-KYC Module of all registered stakeholders and entities
- GSTIN e-Way Bill Integration
- VTMS System development and Integration with ILMS
- Mining Lease Application Submission and Tracking Information
- Dashboard and BI Analytics for stake holder of ILMS
- Integration with online e-Grass (Virtual Treasury) –Site to site integration
- Mobile App development for End User/ Buyer
- Coal Washery integration for Coal Dispatch

Outcomes :

- The ILMS ensures real-time tracking of lease applications, approvals, and renewals, significantly reducing the scope for irregularities.
- All stakeholders, including government departments, mining operators, and the public can access relevant data fostering openness in lease management process
- Integration with satellite imagery and GIS tools aids in monitoring mining activities, preventing illegal mining and over-extraction

Source: State Ministry information received and secondary research

Snapshot of ILMS



2 Mahakhanij system

Mahakhanij System is a web-based solution initiative by Department of Revenue and Forest, Government of Maharashtra to combat illegal mining and transportation of minor minerals

This initiative aids the department in making a reasonable advancement in terms of maintaining a database related to minerals, registered agencies, lease period, renewals, tracking and monitoring the movement of minerals, payment processes, recovery procedures, and so on.

Key Features of Mahakhanij System

- **Centralized Data Management**: The Mahakhanij system stores all data related to mining activities on a central cloud server, ensuring easy access and management for authorized users
- **Interstate Mineral Transport**: The system is equipped to handle interstate mineral transport, requiring registration and payment through its platform, thereby simplifying compliance with regulatory requirements
- **User-Friendly Interface**: The interface is designed to be intuitive, making it accessible for various stakeholders involved in the mining sector, including government officials and mining operators

Outcomes

- Mahakhanij system consolidates all data related to mineral mining activities into a central cloud server, facilitating better access and management for stakeholders involved in mining operations
- The system employs advanced technologies such as Automatic Number Plate Recognition (ANPR) to monitor vehicle movements effectively

3 Mahageomin system:

The objective of Mahageomin Project is to prepare master plan for all the major minerals mining leases of Maharashtra and monitor mining activates, provide access to geological, mineral location, mining lease data and relevant data to end users

Under the guidelines of Maharashtra Remote Sensing Application Centre (MRSAC) well equipped geospatial lab has been established in DGM Maharashtra for monitoring of mining activities in state

The database created in Mahageomin project is linked with mining surveillances system (MSS), and therefore it is easy to bring effective control over illegal excavation

Key Features of Mahageomin System:

- Integrated IT Solutions: Mahageomin introduces an integrated IT-enabled process that replaces manual tracking with a digital platform, allowing for comprehensive monitoring of mineral extraction and transportation from quarries to their final destinations
- End-to-End Tracking: One of the significant advancements is the capability for end-to-end tracking of minor minerals. This feature ensures that the actual quantities extracted are accurately recorded and monitored throughout the supply chain

Outcomes :

- Efficiency in Operations: By automating processes that were previously handled manually, the system significantly reduces delays and improves service delivery in mineral management.
- Transparency and Accountability: The digital nature of the Mahageomin system fosters greater transparency in mining operations, making it easier to track compliance with regulations and monitor illegal activities

4 Mine Surveillance system:

MSS is system which gives trigger if mining excavation is carried out of lease area, and on receipt such information DGM through mining officer of concerned district conduct inspection and investigation and takes action according to rules and regulation

This system leverages advanced technology, such as satellite monitoring, geospatial tools, and real-time data analytics, to oversee mining activities across the state

Key Features of Mine Surveillance System:

- High-resolution satellites track changes in land use and detect unpermitted mining activities.
- Periodic analysis of satellite imagery ensures that any unauthorized excavation is identified promptly
- Each mine is geo-tagged with its approved boundaries. A geo-fencing mechanism raises alerts when mining activity occurs outside the designated areas
- A mobile app is integrated with MSS to allow stakeholders, including citizens and officials, to report incidents of illegal mining in real-time

Outcomes

- MSS identifies unauthorized mining activities through satellite imagery and geo-fencing, enabling authorities to act quickly.
- The system has significantly curbed illegal mining, safe-guarding natural resources and preventing revenue loss.
- The system ensures that mining operations are confined to approved areas, preventing over-extraction and resource depletion

5 Pre Embed clearance

Key Features of Mine Surveillance System:

- The initiative involves securing key regulatory clearances, such as environmental and forest clearances, before auctioning mining blocks.
- This ensures that investors and mining operators face fewer procedural delays after acquiring the blocks

Outcomes

- The state has already selected 5 mineral blocks for pre-embedded clearance initiative.
- The process of obtaining clearance from various departments is ongoing. The followup with various departments is being handled by the DGM.

6 Digitization, Segregation and Categorization of Past Exploration data/ reports

Key Features of Mine Surveillance System:

- Outsourcing the collection of Seigniorage Fee/Royalty to third-party agencies involves delegating the responsibility of managing and collecting royalties or fees from mining operations to an external agency

Outcomes

- The Directorate of geology and Mining Maharashtra has scanned all their old geological reports for the purpose of digitization and will upload them on the NGDR portal very soon. Additionally digital platforms such as Bukosh and others have been used to ensure better tracking of mineral exploration related work.

7 Outsourcing right of seigniorage fee

Key Features of Mine Surveillance System:

- The Digitization, Segregation, and Categorization of Past Exploration Data in Odisha is a strategic initiative aimed at organizing and utilizing historical exploration data for efficient mineral resource management

Outcomes

- DGM Maharashtra is in process of the engagement of quality council of India to appoint as Independent 3rd party agency to carry out major mineral sampling and analysis.

8 Drone survey for Quarries and Mines

Key Features of Mine Surveillance System:

- The Drone Survey for Quarries and Sand Mines is an initiative aimed at improving precision in resource mapping and regulatory compliance. Using advanced drones equipped with GPS and digital cameras, the surveys generate detailed plans, 3D models, and volumetric analyses.

Outcomes

- Drone surveys are conducted regularly for inspecting illegal mining activities and for general inspection of sand ghats. All of these activities are monitored through the Mahakhanij system. A total of 190 drone surveys were conducted in the year 2024.

Summary of Initiatives & Recommendations - Maharashtra (1/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Maharashtra						

S.No.	Initiative adopted	Impact from adoption of Initiative
1	Integrated Lease Management system	▪ The ILMS ensures real-time tracking of lease applications, approvals, and renewals, significantly reducing the scope for irregularities ▪ All stakeholders, including government departments, mining operators, and the public can access relevant data fostering openness in lease management process
2	Mahakhanij system	▪ Mahakhanij system consolidates all data related to mineral mining activities into a central cloud server, facilitating better access and management for stakeholders involved in mining operations ▪ The system employs advanced technologies such as Automatic Number Plate Recognition (ANPR) to monitor vehicle movements effectively
3	Mahageomin project	▪ Efficiency in Operations: By automating processes that were previously handled manually, the system significantly reduces delays and improves service delivery in mineral management. ▪ Transparency and Accountability: The digital nature of the Mahageomin system fosters greater transparency in mining operations, making it easier to track compliance with regulations and monitor illegal activities
4	Mine Surveillance system	▪ MSS identifies unauthorized mining activities through satellite imagery and geo-fencing, enabling authorities to act quickly. ▪ The system has significantly curbed illegal mining, safe-guarding natural resources and preventing revenue loss.
5	Pre-Embed clearance	▪ The state has already selected 5 mineral blocks for pre-embedded clearance initiative. ▪ The process of obtaining clearance from various departments is ongoing. The followup with various departments is being handled by the DGM.
6	Digitization, Segregation and Categorization of Past Exploration data/ reports	▪ The Directorate of geology and Mining Maharashtra has scanned all their old geological reports for the purpose of digitization and will upload them on the NGDR portal very soon. Additionally digital platforms such as Bukosh and others have been used to ensure better tracking of mineral exploration related work
7	Outsourcing right of seigniorage fee	▪ DGM Maharashtra is in process of the engagement of quality council of India to appoint as Independent 3rd party agency to carry out major mineral sampling and analysis. ▪ This will go a long way in preventing misclassification of grades. This will be a significant step to improve state government royalty and revenue
8	Drone survey for Quarries and Mines	▪ Drone surveys are conducted regularly for inspecting illegal mining activities and for general inspection of sand ghats. All of these activities are monitored through the Mahakhanij system. A total of 190 drone surveys were conducted in the year 2024.

Summary of Initiatives & Recommendations - Maharashtra (2/2)

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Maharashtra						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Mineral Administration and Mineral Concession

- Other states have have adopted other initiatives:
- Post auction facilitation establishment
- Facilitating Compensatory Afforestation
- These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines

Exploration and Mines development

- Other states have have been actively pursuing initiatives:
- Strategic Collaboration for Mineral Resource Mapping
- Establishment of State Mineral exploration trust
- Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation

Sustainable Mining Practices

- Other states have adopted other initiatives:
- DMF Portal
- Mines and Mineral Restoration and Rehabilitation Fund
- Upgradation of Healthcare services
- These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Mine closure, waste management , reclamation and rehabilitation

- Other states have adopted the initiatives:
- Management of Abandoned mines
- Dumping of Overburden and waste outside the lease area for Minor minerals
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Skilling and Capacity Building

- Other states have adopted the initiatives:
- Human Resource Development
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

For more information, visit the following website: *Directorate of Geology, Nagpur*

5.4 State-wise initiatives and outcomes

15. Meghalaya

Meghalaya Mineral Scenario

- Meghalaya, a picturesque state in India's northeast, is not only renowned for its lush green landscapes, rolling hills, and unique biodiversity but also for its rich mineral wealth. The state's geological formations harbour a variety of significant mineral resources, making mining an integral part of its economy.
- The abundance of limestone, coal, uranium, and other minerals has attracted both small-scale and large-scale mining activities over the years. However, the region's mining sector operates within the unique framework of Meghalaya's tribal landownership system, where natural resources are predominantly controlled by local communities rather than the state government.

What's going on so far...

- Approximately 26,000 abandoned rat-hole coal mines in East Jaintia Hills district remain unsealed, posing significant risks to human safety and the environment.
- Efforts to regulate and monitor mining activities face challenges due to the complex interplay of local governance, traditional land rights, and enforcement limitations.
- The persistence of illegal mining activities has led to environmental degradation and has been associated with accidents resulting in loss of life, underscoring the need for effective enforcement of mining regulations

Best Practices adopted by Meghalaya

Thematic Area: Mineral Administration

1 Meghalaya Minor Mineral Concession Rule 2016:

The Meghalaya Minor Mineral Concession Rules, issued under the authority of the state government, govern the extraction, processing, and transportation of minor minerals within Meghalaya. These rules aim to regulate the mining activities of minor minerals while ensuring sustainable practices and equitable distribution of mineral resources.

Highlights:

- The rules provide a structured framework for granting mining leases and quarry permits for minor minerals, ensuring that all mining activities are regulated
- The rules specify that mining leases and permits are granted by designated authorities, such as the Director of Mineral Resources or competent officers, based on the area size and intended use of the minerals.
- The rules establish mechanisms for regular monitoring of mining activities and require operators to submit periodic reports on mineral production and transportation.

Outcomes :

- The rules ensure that the extraction of minor minerals is conducted in a regulated manner, promoting sustainable mining practices.
- Regular oversight ensures compliance with regulations, helping to prevent illegal mining activities and promoting transparency in operations.

Source: State Ministry information received and secondary research

Summary of Initiatives & Recommendations - Meghalaya

Initiative overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Meghalaya						

S.No.	Initiative adopted	Impact from adoption of Initiative
1	Meghalaya Minor Mineral Concession Rule 2016	▪ The rules ensure that the extraction of minor minerals is conducted in a regulated manner, promoting sustainable mining practices. ▪ Regular oversight ensures compliance with regulations, helping to prevent illegal mining activities and promoting transparency in operations.

Recommendation

Mineral Administration and Mineral Concession	▪ Other states have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	▪ Other states have been actively pursuing initiatives: ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Sustainable Mining Practices	▪ Other states have adopted other initiatives: ▪ M-Sand Policy ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development
Technology, research and development	▪ Other states have adopted other initiatives: ▪ Mine Surveillance system ▪ Drone Survey of Quarries ▪ E-Check gate implementation ▪ Sand Mine Portal ▪ These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.
Social project implementation	▪ Other states have adopted other initiatives: ▪ DMF Portal ▪ Mines and Mineral Restoration and Rehabilitation Fund ▪ Upgradation of Healthcare services ▪ These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .
Mine closure, waste management , reclamation and rehabilitation	▪ Other states have adopted the initiatives: ▪ Management of Abandoned mines ▪ Dumping of Overburden and waste outside the lease area for Minor minerals ▪ These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.
Skilling and Capacity Building	▪ Other states have adopted the initiatives: ▪ Human Resource Development ▪ This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

For more information, visit the following website: *Homepage: Department of Mining and Geology*

5.4 State-wise initiatives and outcomes

16. Mizoram

Mizoram Mineral Scenario

- Mizoram is part of the Assam-Arakan Basin, comprising predominantly sedimentary rocks such as sandstones, shales, and limestones. These rocks belong to the Bhuban Formation of the Surma Group, dating from the Late Oligocene to Early Miocene age
- The state has reported occurrences of various minerals, including limestone, sandstone, clay, coal, and petroleum. There is also a strong possibility of uranium mineralization, although it has yet to be thoroughly explored
- Mizoram accounts for less than 1% of the national mineral production. Major deposits of economic importance have not been reported so far, and the state is devoid of any major mineral-based industries
- With the realization of full-fledged crude oil production, the state could see the establishment of polymer, plastic, and paint industries. Additionally, the development of cement, pottery, sandstone, and tile manufacturing units is feasible based on the current availability of workable deposits

What's going on so far...

- Mining in Mizoram is governed by the Mines and Minerals (Development and Regulation) Act, 1957 and state-specific rules.
- The Environmental Protection Act, 1986 plays a crucial role due to the ecologically sensitive zones.
- Currently, the mining sector in Mizoram contributes modestly to the state's economy.
- The focus has been on local use rather than large-scale extraction for export or industrial use.
- The government and private players are likely to intensify efforts to explore untapped mineral reserves, especially oil, gas, and limestone.
- Modern geological surveys and technologies such as GIS are expected to be used.
- Emphasis on sustainable mining to protect Mizoram's unique biodiversity.
- Development of limestone mining could spur cement industries, given the increasing demand for construction materials in northeastern India.

Best Practices adopted by Mizoram

Thematic Area: Mineral Administration

1. Minor Minerals Concession

The government regulates and administers the rules for granting mining leases and permits and preventing illegal mining. The administration and concession of minor minerals in Mizoram are governed by The Mizoram Minor Minerals (Concession & Prevention of Illegal Mining) Rules, 2023 and the DMF rules of Mizoram, 2023. These rules are designed to regulate the extraction and management of minor minerals, ensuring that mining activities are conducted legally and sustainably.

Key Features and Highlights:

- Preferential rights for surface landowners in granting mineral concessions, which simplifies the process and encourages local participation.
- Clear guidelines for the concession process to ensure transparency, efficiency, and fairness in the allocation of mining rights.

Outcomes :

- 9 permanent check gates to monitor transport of minor minerals and to penalize illegal transports.
- 13 mobile check gates in areas where minor mineral exploitation is being undertaken.

Source: State Ministry information received and secondary research

2. Sand Mining

Sustainable River Sand Mining guidelines have been incorporated into Rule 16 of the MMMCPIM Rules, 2023. These guidelines aim to promote environmentally friendly sand mining practices that minimize ecological impact and ensure the sustainable use of sand resources.

Key Features and Highlights:

- Allocation of sand mining through an auction system, which is pending approval of District Survey Reports to ensure thorough environmental assessment.
- Emphasis on sustainable and environmentally friendly mining practices to protect river ecosystems and prevent over-extraction.

Outcomes :

- Establishment of a policy for environmental clearance for mining leases in clusters, specifically for minor minerals up to 5 hectares and 25 hectares in cluster mining.
- Formation of the DEIAA, headed by the District Collector, to oversee the environmental clearance process for mining activities.
- Development of guidelines by the Ministry of Environment, Forest and Climate Change (MoEF&CC) in consultation with state governments. These guidelines detail the provisions for environmental clearance for different mining clusters and emphasize the importance of sustainable practices.

Summary of Initiatives & Recommendations - Mizoram (1/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Mizoram						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1	Minor Minerals Concession	▪ 9 permanent check gates to monitor transport of minor minerals and to penalize illegal transports. ▪ 13 mobile check gates in areas where minor mineral exploitation is being undertaken.
2	Sand Mining	▪ Establishment of a policy for environmental clearance for mining leases in clusters, specifically for minor minerals up to 5 hectares and 25 hectares in cluster mining. ▪ Formation of the DEIAA, headed by the District Collector, to oversee the environmental clearance process for mining activities. ▪ Development of guidelines by the Ministry of Environment, Forest and Climate Change (MoEF&CC) in consultation with state governments. These guidelines detail the provisions for environmental clearance for different mining clusters and emphasize the importance of sustainable practices.

Recommendation

Mineral Administration and Mineral Concession

- Other states have adopted other initiatives:
- Pre-embedded clearances for auction and
- Post auction facilitation establishment
- Facilitating Compensatory Afforestation
- These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines

Exploration and Mines development

- Other states have been actively pursuing initiatives:
- Digitization, Segregation and Categorization of Past Exploration data/ reports
- Strategic Collaboration for Mineral Resource Mapping
- Establishment of State Mineral exploration trust
- Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation

Sustainable Mining Practices

- Other states have adopted other initiatives:
- M-Sand Policy
- Star Rating of Minor Minerals
- Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development

Technology, research and development

- Other states have adopted other initiatives:
- Mine Surveillance system
- Drone Survey of Quarries
- E-Check gate implementation
- Sand Mine Portal
- These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.

Summary of Initiatives & Recommendations - Mizoram (2/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Mizoram						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Social project implementation

- Other states have adopted other initiatives:
- DMF Portal
- Upgradation of Healthcare services
- District Mineral Foundation
- These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Mine closure, waste management , reclamation and rehabilitation

- Other states have adopted the initiatives:
- Management of Abandoned mines
- Dumping of Overburden and waste outside the lease area for Minor minerals
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Skilling and Capacity Building

- Other states have adopted the initiatives:
- Human Resource Development
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

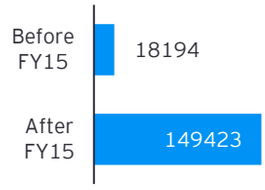
For more information, visit the following website: Directorate Of Geology & Mining, Government of Mizoram, India

5.4 State-wise initiatives and outcomes

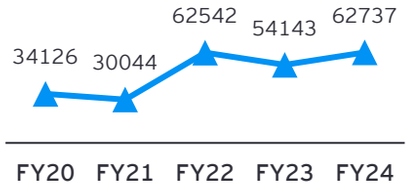
17. Odisha

KPIs so far....

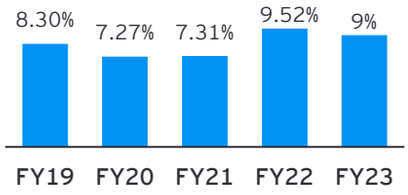
(Revenue Pre & Post Auction), INR Cr



Value of mineral production, INR Cr



Mining contribution (%) to State GDP



Odisha Mineral Scenario

- Odisha is one of India's richest states in terms of mineral resources, with significant deposits of iron ore, chromite, bauxite, and limestone. These resources are crucial for various industries, including steel, aluminum, and cement production.
- The state's location, with access to both the Eastern Ghats and a long coastline along the Bay of Bengal, enhances its mining potential and facilitates both domestic and international trade.
- Odisha boasts well-developed infrastructure for mining, processing, and transportation of minerals. Major industrial clusters and mining regions are supported by robust road, rail, and port connectivity, which facilitate efficient mineral logistics.
- Ranked in the "achiever" category in 2020 by the Department for Promotion of Industry and Internal Trade (DPIIT), Government of India.

What's going on so far...

- Odisha is a major hub for iron ore production in India. However, there are concerns about the depletion of these reserves. A public interest litigation highlighted that due to excessive mining, iron ore reserves in Odisha might be exhausted within the next two decades. Despite this, the state continues to be a significant contributor to India's iron ore output.
- Odisha also has substantial coal reserves. The state has been actively auctioning coal blocks to private and public sector companies. These auctions are part of the government's efforts to boost domestic coal production and reduce dependency on imports.
- The mining sector in Odisha faces several challenges, including environmental concerns and illegal mining activities. The state government has been working to address these issues through stricter regulations and enforcement measures.
- The state has adopted an auction-based system for mining leases to ensure transparency and fair competition. However, the Comptroller and Auditor General (CAG) of India reported irregularities in the auction process. There was a significant decline in the grade of iron ore reported by new lessees' post-auction, which led to substantial revenue losses for the state

Best Practices adopted by Odisha

Thematic areas - Mineral administration

1 Implementation of Land Management System (GO-Plus)

GO-Plus, an Integrated Land Management System, has been implemented to monitor and automate various land-related activities within the lease area. This comprehensive system enhances visibility on land identification, land use patterns, and record-keeping by continuously tracking and supervising all land management operations. By automating routine tasks, O-Plus reduces manual intervention, increases efficiency, and minimizes human error, ensuring that all data is easily accessible and well-organized

Highlights:

- E-Governance Integration: Streamlines land allocation, compliance monitoring, and revenue management using digital tools.
- Monitoring & Enforcement: Prevents unauthorized mining and ensures efficient resource use through a dedicated Directorate for Minor Minerals.
- Transparency in Land Transactions: Provides up-to-date information to stakeholders via online platforms, reducing disputes and malpractice.

Outcomes :

- The Government of Odisha has created a land bank of 1,00,000 acres for industrial use.
- The Industrial Development Corporation of Odisha (IDCO) has collaborated with various primary processing companies to co-create plug & play parks.
- As part of the collaboration with Private Players, raw material security is ensured. For instance, NALCO has committed to 50,000 tonnes of Hot Metal for Downstream manufacturers within the park.

Source: State Ministry information received and secondary research

2 Implementation of Logistics Management System (LMS):

The Logistics Management System (LMS) is an IoT-based application that enhances ore-handling and evacuation capabilities through automated digital workflows. It aims to improve efficiency and transparency in logistics management by providing real-time data and insights, reducing delays, and minimizing errors.

Features and Highlights:

- Weighbridge Automation: Automates vehicle weighing for accurate and efficient ore measurement.
- Traffic Management System: Optimizes vehicle flow to reduce congestion and improve safety.
- Surveillance through Command & Control Centre: Monitors the mining area for enhanced security and quick incident response.
- Stockyard Management: Manages ore storage and handling for efficient dispatch and quality maintenance.
- Integration of i3MS Dispatch Database for Real-Time Monitoring: Provides real-time monitoring of ore dispatches for improved transparency and decision-making

Outcomes

- Odisha's excellent performance in developing good logistics network can be gauged from the Logistic Ease Across Different States (LEADS) score by the Ministry of Commerce & Transport, Government of India. Odisha has jumped from 10th Rank in 2019 to 7th Rank in 2021.
- it is decided to extend the implementation tenure of i3MS for five more years (2022-2027) with an expenditure of INR 326.79 crore. Steps are being taken to adopt drone technology to further improve the i3MS system.

3 Auctions and Operationalization of New Mines:

Supply of raw materials to the mineral based industry is a serious challenge for any Government as consumption has increased many folds. Odisha, being the most mineral rich State in the country has the responsibility to ensure an adequate supply of raw materials to industry and Odisha is making every effort to fulfil the same.

Features and Highlights

- The auction sale of minor minerals is a way to sell or dispose of them to the highest bidder.
- The Competent Authority sets the terms and conditions of the auction.
- There are two types of concessions granted i.e., Quarry lease and Quarry permit.

Outcomes

- Since 2015, Odisha has completed the highest number of successful auctions in the country. Odisha has not only been able to successfully complete the auction process of 40 mineral blocks but has also operationalized 25 blocks since 2015.
- Fifteen more mineral blocks of Iron ore, Bauxite, Manganese, Limestone & Dolomite, Copper & Nickel are almost ready for auction.
- Two iron ore mines, Jilling-Langalota and Guali in Keonjhar district, were allocated to Odisha Mining Corporation Ltd within 25 days, with all clearances from the Central Government, and OMC began production in under 40 days.

4 Exploration program to generate new auctionable blocks:

Exploration Program to Generate New Auctionable Blocks refers to initiatives undertaken by the Government of Odisha to identify and evaluate mineral deposits in the state. These programs aim to enhance the state's mineral resource base and provide auction-ready mineral blocks for mining, ensuring sustainable economic development and support for mineral-based industries.

Features and Highlights:

- Use of modern geological and geophysical methods such as remote sensing, drilling, and sampling.
- Engagement of agencies like the Geological Survey of India (GSI), Odisha Mining Corporation (OMC), and private exploration firms.
- Prioritizing minerals in high demand, such as iron ore, bauxite, chromite, coal, limestone, and manganese.
- Identifying both greenfield (new sites) and brownfield (extensions of existing sites) exploration opportunities.
- Encouragement of Public-Private Partnerships (PPPs) for advanced exploration.
- Inter- department collaboration for auction approval

Outcomes

- In the last five years i.e. from 2017-2018 to 2021-2022, the Directorate of Mines & Geology, Government of Odisha has completed 89 Geological explorations, finalized 39 Geological Reports for auctionable blocks, and identified 36 blocks for upgradation of resources.
- Currently, 111 blocks have been allotted to various Government agencies for the exploration.

5 Facilitating compensatory afforestation:

Odisha, rich in minerals like iron ore, bauxite, and coal, faces forest land diversion due to extensive mining, requiring compensatory afforestation to restore ecological balance. State has created a land bank for Compensatory Afforestation which is unique at its kind to facilitate the Project Proponent for Forest Clearances. Continued efforts in monitoring, innovative restoration techniques, and stakeholder collaboration will further strengthen these initiatives.

Features and Highlights:

- Forest (Conservation) Act, 1980: Mining projects requiring forest land diversion must seek clearance under this act and undertake compensatory afforestation as a precondition.
- Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act): Ensures sustainable mining practices and mandates environmental restoration activities, including afforestation.
- Environmental Clearance: The Ministry of Environment, Forest, and Climate Change (MoEF&CC) requires mining companies to submit afforestation plans as part of their Environmental Impact Assessment (EIA).

Outcomes :

- OMC plants saplings @ 1 tree per 10 metric tons of ore extracted as part of its green initiative. Since the inception of this initiative, OMC has spent a substantial Rs. 88.01 Crore, resulting in the planting of 90.37 lakh trees across various forest divisions in Odisha.

6 Pre embedded Clearance :

It ensures that critical approvals and permissions, such as environmental and land clearances, are obtained in advance by the authorities. This reduces procedural delays, simplifies the bidding process, and enhances project readiness for immediate operationalization.

Features and Highlights:

- The initiative involves securing key regulatory clearances, such as environmental and forest clearances, before auctioning mining blocks. This ensures that investors and mining operators face fewer procedural delays after acquiring the blocks.
- Odisha has implemented systems like the Integrated Mines and Minerals Management System (I3MS) to enhance transparency and efficiency in mining operations. This system facilitates the monitoring of compliance and the management of pre-clearances to ensure sustainable mining practices.

Outcomes

- State has initiated two mineral blocks under Pre embedded clearances and one of these are in advance stage where Public hearing is to be conducted shortly.

7 Long Term Linkage (LTL) Policy:

The Long-Term Linkage (LTL) Policy in Odisha is designed to ensure a steady supply of minerals to industries within the state by facilitating agreements through the Odisha Mining Corporation (OMC). This policy primarily targets mineral-based industries such as steel and aluminium plants, ensuring they have consistent access to resources like iron ore and bauxite. The initiative supports industrial growth, generates revenue for the state, and promotes transparent allocation mechanisms.

Features and Highlights:

- Auction-based Allocation: Minerals are allocated through competitive bidding to maintain fairness.
- Priority to Local Industries: Preference is given to industries operating within Odisha to boost the state's economy.
- Transparent Mechanism: Allocation processes and pricing are governed by transparent guidelines to ensure accountability.
- Revenue Maximization: The policy aims to enhance state revenue by securing competitive prices during allocations.
- Sustainability Focus: The policy considers environmental and social impacts, ensuring responsible mining and mineral usage.

Outcomes

- The State has developed a Long-Term Linkage policy wherein 20% of the material of OMC is kept in national auction to discover the market price of the mineral and remaining 80% of the total production of the OMC is allocated through the said policy to the needy industries at the price discovered from the auction. This process is applicable for Iron, manganese, Bauxite, Chromite and Limestone.

8 Mineral Dealer License System:

In Odisha, the mineral dealer license system is governed by the Odisha Minerals (Prevention of Illegal Mining, Transportation, and Storage) Rules, 2007, along with provisions under the Mines and Minerals (Development and Regulation) Act, 1957. To operate as a mineral dealer in Odisha, individuals or companies must obtain a mineral dealer's license from the concerned authority.

Features and Highlights:

- Regulates and licenses mineral trade: Only licensed dealers can buy, sell, and transport minerals, ensuring legal and transparent operations.
- Eligibility and compliance: Dealers must meet business registration, financial, and environmental standards, and maintain records of transactions.
- Periodic inspections and audits: Authorities conduct regular checks to ensure compliance with mining and safety regulations.

Outcomes

- The State gives dedicated licences for Storage, Transportation, export of minerals. These licences are getting registered under i3MS and all of the mineral transaction happening under them are getting monitored centrally.

9 Post Auction Facilitation Cell:

The state established a Post Auction Cell to facilitate preferred bidders for both minor and major minerals with two separate appointed Nodal Officers. The primary objective of the PAFC is to provide a structured, streamlined process for managing and facilitating all activities and legal requirements following the auction of mineral resources. These include the allocation of mining leases, compliance with statutory obligations, obtaining necessary clearances, and assisting miners with various post-auction formalities

Features and Highlights:

- Assists successful bidders in complying with regulatory requirements, obtaining necessary clearances, and starting operations.
- Facilitates coordination between bidders and government departments to speed up approvals and clearances.
- Monitors progress and ensures compliance, providing support for capacity building and resolving grievances.

Outcomes

- State is conducting review at regular interval for auctioned mineral blocks and taking updates from the stake holders on their clearances. Dedicated Nodal agency is created for the monitoring of the same. Digital integration of the same is also designed and to be launched shortly.

10 Auction of Sand Mines:

The primary goal of the sand mining auction process in Odisha is to bring transparency to the extraction of sand and curb illegal mining practices. It ensures that sand mining activities are conducted by licensed entities that adhere to environmental and legal regulations while contributing to the state's revenue.

Features and Highlights

- Sand Mines auction are conducted through an online bidding platform to ensure transparency and fairness.
- Registered bidders can access auction details, participate in real-time bidding, and secure mining leases.
- The online system encourages participation from multiple stakeholders, including private contractors, cooperative societies, and local entities

Outcomes

- The State is conducting sand mining auction from 2019 and so far, 3333 Nos of sand mines have been auctioned in the State.

11 Enforcement:

State of Odisha has set up two levels of enforcement squads for vigilant morning of mineral transaction throughout the State such as State Level Enforcement Squad headed by Chief Secretary and District Level Enforcement Squad headed by District Collector.

Features and Highlights:

- The squads are responsible for ensuring compliance with mineral regulations, preventing illegal activities such as unauthorized mining and transportation
- he squads work together, with the state-level squad providing broader oversight and the district-level squad focusing on ground-level vigilance

Outcomes

- Reduction in Illegal Mining: The vigilance of both the state and district-level squads has helped reduce illegal mining activities, ensuring that all mining operations comply with state laws and regulations
- Strengthened Accountability: These squads have increased accountability within the mining sector, making it more difficult for illegal transactions to go unnoticed, thus promoting transparency in mineral trade

Thematic Area: Mineral Exploration

12 MoU with CSIRO, Australia:

Odisha Mining Corporation (OMC) has entered into a significant partnership by signing a Memorandum of Understanding (MoU) with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) of Australia. This collaboration is set to provide OMC with valuable technical guidance and expertise for the development of a state-of-the-art Drill Core Library. The primary objective of this initiative is to significantly enhance the exploration capabilities within the state of Odisha. By leveraging CSIRO's advanced technological knowledge and experience, OMC aims to improve the efficiency and effectiveness of its mineral exploration processes, ultimately contributing to the sustainable development of the region's mining sector.

Features and Highlights:

- Technical Guidance: This collaboration provides OMC with access to advanced methodologies and expertise from CSIRO, enabling the adoption of cutting-edge technologies and best practices in mineral exploration and management.
- Resource Mapping: The partnership aims to enhance techniques for identifying and managing mineral resources, leading to more accurate and efficient resource mapping and utilization.

Outcomes :

- The drill core library will have a storage capacity of 6,00,000-8,00,000 meters of drill core.
- CSIRO has equipped the laboratory with state-of-the-art instruments for detailed analysis of drill cores. This includes the Maia Mapper, which offers high-resolution elemental imaging, and the HyLogger-3, which uses rapid reflectance spectroscopy to determine mineralogy

13 Digital Implementation of ArcGIS for Mineral Resource Mapping:

The use of ArcGIS in this context involves creating detailed base maps of government-notified blocks. This process integrates legacy data from various sources, including the Geological Survey of India (GSI), the Department of Mines and Geology (DoMG), and historical reports. The primary goal of this digital implementation is to streamline data visualization, making it easier to access and analyze critical information. By leveraging ArcGIS, the initiative aims to enhance the accuracy and efficiency of mineral resource mapping, ultimately supporting better decision-making and resource management.

- **Features and Highlights:**
  - Base Maps Creation: This involves the integration of various data sources, including legacy data from the Geological Survey of India (GSI), the Department of Mines and Geology (DoMG), and historical reports.
  - Mineral Atlas: The development of a desktop version of the Mineral Atlas aims to enhance data visualization and analysis. This tool will provide users with an accessible and interactive platform to view and analyze mineral resource data, improving the overall efficiency and accuracy of resource management and decision-making processes.
- **Outcomes**
  - The detailed maps have improved the accuracy and efficiency of mineral exploration activities. By providing precise geological and topographical information, these maps help in identifying potential mineral-rich areas more effectively
  - The mineral atlas serves as a comprehensive repository of the state's mineral resources, aiding in better management and utilization. It helps in planning and decision-making processes for both government and private stakeholders

14 Airborne and Heliborne Geophysical Investigations:

Government of Odisha, in collaboration with World Geoscience Corporation, Australia, acquired high Resolution Airborne magnetic and spectrometric data for the period 1993-1998. Planned airborne and heliborne surveys aim to identify targeted metal deposits using advanced aerial techniques. These surveys are expected to efficiently explore and map potential mineral resources.

Features and Highlights

- Advanced Aerial Techniques: Utilizes cutting-edge technology, like drones, for precise resource identification and mapping.
- Efficient Exploration: Enhances the ability to explore and identify mineral reserves in less accessible areas.
- Data Integration and Analysis: Combines various data sources for comprehensive analysis, improving decision-making and resource management.

Outcomes

- Coverage – 75,000 sq. km with 3,30,000-line km
- Flying – height of 80m with a line spacing of 250m
- 9 blocks with 22 target areas having potential commodities such as Copper, Gold, Lead, Zinc, Silver, Nickel, Chromium, PGE has been identified for further exploration through Heliborne Time Domain Electro Magnetic (HTDEM) & Fixed Wing Magnetic (FWM) Surveys

15 Strategic Collaboration for Mineral Resource Mapping:

Odisha has partnered with global mineral exploration agencies, engaging them as Strategic Technical Consultants (STC) to the Odisha Mining Corporation (OMC). This collaboration is centered on leveraging advanced techniques for mineral resource mapping and the identification of potential mineral blocks. By bringing in international expertise, the partnership aims to enhance the accuracy and efficiency of exploration activities, ensuring that Odisha's mineral resources are identified and managed effectively.

Features and Highlights:

- Global Expertise: This partnership provides access to international best practices and advanced tools, ensuring that the latest and most effective techniques are applied in mineral exploration and management.
- Resource Mapping: The collaboration adopts a systematic and scientific approach to resource identification, enhancing the accuracy and efficiency of mapping potential mineral blocks.

Outcomes

- A centralized platform, Mineral Exploration Data Base Management System (MEDBMS), is being developed by the State for capturing the data pertaining to exploration, mining, tenement etc. for analyzing, and visualization.

16 Digitization, Segregation and Categorization of Past exploration data:

The Digitization, Segregation, and Categorization of Past Exploration Data in Odisha is a strategic initiative aimed at organizing and utilizing historical exploration data for efficient mineral resource management. This initiative is a crucial component of Odisha's collaboration with global mineral exploration agencies as Strategic Technical Consultants (STC) to the Odisha Mining Corporation (OMC).

Features and Highlights:

- Global Partnership with international agencies to bring technical expertise and advanced methodologies to mineral exploration.
- Advanced Techniques: Utilizes modern approaches such as airborne and heliborne surveys for comprehensive mapping and analysis of legacy exploration data
- Resource Mapping and Identification: Enhances mineral resource mapping to identify untapped mineral reserves and high-potential blocks for future auctions and mining activities

Outcomes :

- The Odisha Mineral Exploration Corporation Ltd (OMECL) signed an agreement with Consortium of MSA, South Africa and IDEPX (India) for exploration of mineral deposits in Odisha.

17 Petrography and Mineral Chemistry Laboratory:

The Petrography and Mineral Chemistry Laboratory in Odisha is a key facility under the Directorate of Geology. It focuses on analyzing and characterizing minerals and rocks to support geological exploration and resource development. This lab is equipped for detailed petrographic studies, mineralogical analyses, and chemical testing, which are critical for assessing mineral deposits and understanding their formation and quality.

Features and Highlights:

- Petrographic Analysis: Detailed study of rocks and minerals under a microscope
- Mineral Chemistry Testing

Outcomes

- The State is equipped with advanced XRF & XRD enabled Lab at Bhubaneswar and Joda. The State is also working on setting up of Robo Lab for which approvals at Government level has been taken up.
- Odisha also has advanced testing facilities such as Gem Laboratory, Petrological Laboratory and Ore dressing Laboratory to achieve the mineral investigation objectives in a faster and more accurate manner. 7,939 stones were analyzed in the Gem Laboratory in the last five years and the Directorate of Mines & Geology, Government of Odisha was able to analyze 896 samples and 18 samples from XRF and XRD Lab respectively during 2021-2022

18 Promotion of NPEA:

Notified Private Exploration Agencies initiative in Odisha aims to enhance mineral exploration through strategic involvement of private agencies

Features and Highlights

- Odisha supports the involvement of private exploration agencies for deep-seated and critical minerals such as graphite, gold, PGE (Platinum Group Elements), and rare earth elements, aligning with national mineral development goals.
- NPEAs, sanctioned by the Ministry of Mines, receive exploration licenses directly without an auction process, enabling focused exploration of significant mineral resources.
- Through the National Mineral Exploration Trust (NMET), private agencies receive incentives such as a 25% reimbursement of approved project costs to encourage robust exploration efforts.

Outcomes

- The State has empanelled few Private exploration agencies for exploration and the exploration is going on from past few years.
- The 17 projects, including 11 of critical minerals granted to the five NPEAs are located in Maharashtra, Madhya Pradesh, Chhattisgarh, Odisha, Gujarat and Karnataka.
- A total of Rs 15.88 crore have also been sanctioned from NMET funds, as per the Ministry.

Thematic Area: Skilling and Capacity Building

19 Human Resource Development (Learning, Development and Capacity building):

Odisha is committed to fostering a robust learning culture that prioritizes the enhancement of employee capabilities. This focus on continuous professional and personal development ensures that employees are equipped with the necessary skills and knowledge to excel in their roles. By investing in training and development programs, Odisha aims to create a dynamic and adaptable workforce that can meet the evolving demands of the industry and contribute to the overall growth and success of the organization.

Features and Highlights:

- Structured L&D and Induction Policy: Comprehensive framework for learning and development and induction process for new employees.
- Industry-Academia Interaction: Collaborations with academic institutions for tailored programs.
- Learning Management System (LMS): E-learning platforms for continuous learning and development.
- Management Development Programs: Training programs at reputed institutes for professional knowledge enrichment.
- International Exposure: Participation in global conferences for international insights and best practices.
- In-House Training Programs: Delivery of technical and functional training through top training organizations.
- Leadership Summits and Team Building: Regular summits and team-building activities for employees.

Outcomes

- The state's Vision 2030 aims to achieve more than 50% value addition to the primary metals produced in Odisha, which will further boost employment in the downstream metal sector.
- Collaboration with ITEES, Singapore, as a knowledge partner. This initiative aims to enhance the skill levels of the local workforce by providing high-quality vocational training.
- More than 1,70,000 graduates emerge every year from over 950 training institutions in Odisha. This large pool of skilled manpower is a significant attraction for investors.
- Odisha is home to several globally recognized institutes of higher learning and research, including AIIMS, IIM, IIT, IIIT, CIPET, Institute of Chemical Technology (ICT), CSIR-Institute of Minerals and Materials Technology (IMMT), and Biju Patnaik National Steel Institute. These institutions contribute to the state's reputation as a knowledge hub.

Thematic Area: Technology, research and development

20 Integrated Mines and Minerals Management System (i3MS) & Sand Mine Portal:

The Integrated Mines and Minerals Management System (i3MS) is designed to enhance transparency and efficiency in mineral administration. It includes the automation of government weighbridges and check gates, integration with the railway freight operation information system for coal, and a dedicated helpdesk system with IVRS for user support. The system also features an integrated facility for the authentication of statutory clearances, resource mapping and upgradation of exploration data, and a core sample depository. Additionally, i3MS incorporates drone technology and satellite-based monitoring for improved oversight and capacity building of mining officials through training programs at institutions of eminence.

Features and Highlights:

- E-transit Pass
- VTS & Geo-fencing
- Check point Automation
- Sampling and Testing Automation
- Analytics and Dashboard
- Data democratization and secured data sharing
- Implementation for data security

Outcomes

- Licensee: 147
- Mineral e-Transactions: 3,303
- Revenue Collected: ₹28,456.7 crore
- Permitted Quantity: 248 million metric tonnes (MeT)
- Trip Sheets Generated: 70,329,267 (Data Since: 1st Apr 2024)
- Despatched Quantity: 203 million metric tonnes (MeT)
- Parrel portal called i4MS similar to this but focused on minor minerals and sand mining

21 Check Gate Automation

This initiative aims to ensure secure and auditable mineral transportation by automating the processes at government weighbridges and check gates. By implementing advanced technologies, the system enhances the accuracy and efficiency of weighing and monitoring mineral loads. This automation reduces the risk of human error and fraud, ensuring that all mineral transportation is properly documented and traceable, thereby improving overall security and accountability in the mineral supply chain.

Features and Highlights

- RFID Readers and Antenna: Enables automated tracking and identification of vehicles and goods.
- Proximity Sensors and Boom Barriers: Controls access and enhances security at entry points.
- AI-Powered IP Cameras: Provides intelligent surveillance and monitoring capabilities.
- Traffic Lights and Audio Systems: Manages vehicle flow and provides audible alerts for safety.
- Electronic Controller and Networking: Integrates and controls various automated systems for seamless operation

Outcomes

- Improved Security: The automated gates have enhanced security at industrial and mining sites by providing controlled and monitored access, reducing unauthorized entries.
- Real-Time Monitoring: The gate automation system provides real-time data on vehicle and personnel movements, enhancing the ability to track and manage site activities
- Reduced Manual Intervention: Automation has minimized the need for manual checks, reducing human error and freeing up personnel for other critical tasks

22 Drone Survey for Quarries and Sand Mines

The Drone Survey for Quarries and Sand Mines in Odisha is an initiative aimed at improving precision in resource mapping and regulatory compliance. Using advanced drones equipped with GPS and digital cameras, the surveys generate detailed plans, 3D models, and volumetric analyses.

Features and Highlights

- Accurate Resource Mapping
- Integration with DMF Portal: Links survey data to the District Mineral Foundation (DMF) portal for enhanced transparency and sustainable mining practices
- Volumetric Analysis: Provides detailed reports on extracted and remaining resources, aiding efficient management.

Outcomes

- The State has adopted the Drone based survey for major as well as minor minerals including sand mining blocks.
- Leveraging its state-of-the-art drone technology, Garuda Aerospace has introduced its specialised large scale mapping drones - Bhumi and Vayu that are integrated with artificial intelligence (AI) and machine learning (ML), making way for a more enhanced digitised mapping exercise.

23 GO – SWIFT (Government of Odisha – Single Window for Investor

For the ease of doing business in Odisha and to promote a conducive business environment through transparency and time-bound clearances, the Government has brought GO – SWIFT portal

Features and Highlights

- The Portal also acts a s a repository of information relating to the latest rules, policy initiatives and reforms undertaken by the Government of Odisha to facilitate and handhold the investors.

Outcomes

- The approval process for 52 services from 18 State Government departments has been made online for submission, payment, tracking and processing

Thematic Area: Social Project Implementation

24 DMF Portal

The District Mineral Foundation (DMF) Portal in Odisha is a digital platform designed to track and manage the collection, expenditure, and utilization of funds under the DMF. This fund is created from the contribution of mining companies, where a portion of the royalty from minerals extracted is allocated for welfare and developmental activities in mining-affected areas.

Features and Highlights:

- Transparency: It enables better tracking of the financial flow and usage of funds for community development in mining regions.
- Real-time Data: Ensures that the public, government, and other stakeholders have access to accurate and updated information regarding the DMF's activities.
- Welfare Projects: Supports various projects related to health, education, infrastructure, and environmental rehabilitation in mining-impacted districts.

Outcomes

- Total Accrual - ₹ 23,737.60 Cr
- Total Number of Projects - 30,070
- Total Allocation - ₹ 19,774.19 Cr
- Total Expenditure - ₹ 1,826.71 Cr

25 Water Sanitization

Water, Sanitation and Hygiene Wash are some of the most basic needs for human health and survival. WASH can also be crucial components in freeing people from poverty. Drinking water supply and sanitation in India continue to be inadequate, despite longstanding efforts by the various levels of government and communities at improving coverage.

Features and Highlights:

- Comprehensive Rural Water Supply Programs
- BASUDHA Program: Under this program, Odisha has prioritized the provision of safe drinking water to rural populations, ensuring that every household has access to potable water
- Spot and Protected Water Supply Schemes: Various types of water supply systems, including bore wells and protected water supply schemes, are being set up to cater to specific rural needs

Outcomes

- Total Number of Projects - 364
- Total Allocation - ₹ 39.13 Cr
- Total Expenditure - ₹ 3.08 Cr

Thematic Area: Sustainable Mining Practices

26 Zero waste initiative

The Zero Waste Initiative in Odisha focuses on minimizing waste generation and promoting efficient recycling, waste segregation, and composting at local levels. This initiative emphasizes decentralized waste management, where municipal solid waste is processed at smaller scales through micro-composting centres (MCCs) and material recovery facilities (MRFs). The initiative has achieved notable success, with a high percentage of organic waste being composted and dry waste being channelled for recycling.

Features and Highlights:

- Decentralized Waste Management
- Waste Segregation at Source
- Single-Use Plastic Ban
- Revenue Generation from Waste

Outcomes

- The initiative has led to a considerable increase in the processing of organic waste through micro-composting centers (MCCs), with nearly 96% of wet waste being processed. Additionally, 100% of dry waste is successfully directed to material recovery facilities (MRFs) for recycling

Summary of Initiatives & Recommendations - Odisha (1/4)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Odisha						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1	Implementation of Land Management System (GO-Plus)	▪ The Government of Odisha has created a land bank of 1,00,000 acres for industrial use. ▪ The Industrial Development Corporation of Odisha (IDCO) has collaborated with various primary processing companies to co-create plug & play parks.
2	Implementation of Logistics Management System (LMS)	▪ Odisha's logistics network performance is reflected in its LEADS score, jumping from 10th in 2019 to 7th in 2021. ▪ The i3MS implementation will be extended for five years (2022-2027) with an expenditure of INR 326.79 crore, and drone technology will be adopted to enhance the system.
3	MoU with CSIRO, Australia	▪ The drill core library will have a storage capacity of 600,000-800,000 meters of drill core. ▪ CSIRO has equipped the laboratory with state-of-the-art instruments, including the Maia Mapper for high-resolution elemental imaging
4	Digital Implementation of ArcGIS for Mineral Resource Mapping	▪ Detailed maps have improved the accuracy and efficiency of mineral exploration activities. ▪ These maps identify potential mineral-rich areas and the mineral atlas aids in resource management and planning for stakeholders
5	Airborne and Heliborne Geophysical Investigations	▪ Coverage – 75,000 sq. km with 3,30,000-line km ▪ Flying – height of 80m with a line spacing of 250m ▪ 9 blocks with 22 target areas having potential commodities such as Copper, Gold, Lead, Zinc, Silver, Nickel, Chromium, PGE has been identified for further exploration through HTDEM & FWM Surveys
6	Strategic Collaboration for Mineral Resource Mapping	▪ A centralized platform, Mineral Exploration Data Base Management System (MEDBMS), is being developed by the State for capturing, analysing, and visualizing data related to exploration, mining, and tenements.
7	Human Resource Development (Learning & Development & Capacity building)	▪ Vision 2030 aims for over 50% value addition to Odisha's primary metals, boosting downstream metal sector employment. ▪ Collaboration with ITEES, Singapore, will enhance local workforce skills through high-quality vocational training. ▪ Over 1,70,000 graduates from 950+ training institutions in Odisha provide a significant pool of skilled manpower for investors
8	Integrated Mines and Minerals Management System (i3MS)	▪ Licensee: 147 ▪ Mineral e-Transactions: 3,303 ▪ Revenue Collected: ₹28,456.7 crore ▪ Permitted Quantity: 248 million metric tonnes (MeT) ▪ Trip Sheets Generated: 70,329,267 ▪ Despatched Quantity: 203 million metric tonnes (MeT) ▪ Data Since: 1st April 2024
9	Check Gate Automation	▪ Automated gates enhance security by controlling access, provide real-time monitoring of movements, and reduce manual checks, minimizing errors and freeing up personnel for critical tasks.

Summary of Initiatives & Recommendations - Odisha (2/4)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Odisha						

S.No.	Initiative adopted	Impact from adoption of Initiative
10	Auctions and Operationalization of New Mines	▪ Since 2015, Odisha has completed the highest number of successful auctions in the country. Odisha has not only been able to successfully complete the auction process of 40 mineral blocks but has also operationalized 25 blocks since 2015. ▪ Fifteen more mineral blocks of Iron ore, Bauxite, Manganese, Limestone & Dolomite, Copper & Nickel are almost ready for auction. ▪ Two iron ore mines, Jilling-Langalota and Guali in Keonjhar district, were allocated to Odisha Mining Corporation Ltd within 25 days, with all clearances from the Central Government, and OMC began production in under 40 days.
11	Exploration program to generate new auctionable blocks	▪ In the last five years i.e. from 2017-2018 to 2021-2022, the Directorate of Mines & Geology, Government of Odisha has completed 89 Geological explorations, finalized 39 Geological Reports for auctionable blocks, and identified 36 blocks for upgradation of resources. ▪ Currently, 111 blocks have been allotted to various Government agencies for the exploration.
12	Enforcement	▪ Reduction in Illegal Mining: The vigilance of both the state and district-level squads has helped reduce illegal mining activities, ensuring that all mining operations comply with state laws and regulations ▪ Strengthened Accountability: These squads have increased accountability within the mining sector, making it more difficult for illegal transactions to go unnoticed, thus promoting transparency in mineral trade
13	Facilitating compensatory afforestation	▪ OMC plants saplings @ 1 tree per 10 metric tons of ore extracted as part of its green initiative. Since the inception of this initiative, OMC has spent a substantial Rs. 88.01 Crore, resulting in the planting of 90.37 lakh trees across various forest divisions in Odisha.
14	Pre embedded Clearance	▪ State has initiated two mineral blocks under Pre embedded clearances and one of these are in advance stage where Public hearing is to be conducted shortly
15	Long Term Linkage (LTL) Policy	▪ The State has developed a Long-Term Linkage policy wherein 20% of the material of OMC is kept in national auction to discover the market price of the mineral and remaining 80% of the total production of the OMC is allocated through the said policy to the needy industries at the price discovered from the auction. This process is applicable for Iron, manganese, Bauxite, Chromite and Limestone.
16	Mineral Dealer License System	▪ The State gives dedicated licences for Storage, Transportation, export of minerals. These licences are getting registered under i3MS and all of the mineral transaction happening under them are getting monitored centrally.
17	Post Auction Facilitation Cell	▪ State is conducting review at regular interval for auctioned mineral blocks and taking updates from the stake holders on their clearances. Dedicated Nodal agency is created for the monitoring of the same. Digital integration of the same is also designed and to be launched shortly.
18	Auction of Sand Mines	▪ The State is conducting sand mining auction from 2019 and so far, 3333 Nos of sand mines have been auctioned in the State.

Summary of Initiatives & Recommendations - Odisha (3/4)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Odisha						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
19	Digitization, Segregation and Categorization of Past exploration data	▪ The Odisha Mineral Exploration Corporation Ltd (OMECL) signed an agreement with Consortium of MSA, South Africa and IDEPX (India) for exploration of mineral deposits in Odisha.
20	Petrography and Mineral Chemistry Laboratory	▪ The State is equipped with advanced XRF & XRD enabled Lab at Bhubaneswar and Joda. The State is also working on setting up of Robo Lab for which approvals at Government level has been taken up. ▪ Odisha also has advanced testing facilities such as Gem Laboratory, Petrological Laboratory and Ore dressing Laboratory to achieve the mineral investigation objectives in a faster and more accurate manner. 7,939 stones were analyzed in the Gem Laboratory in the last five years and the Directorate of Mines & Geology, Government of Odisha was able to analyze 896 samples and 18 samples from XRF and XRD Lab respectively during 2021-2022
21	Promotion of NPEA	▪ The State has empanelled few Private exploration agencies for exploration and the exploration is going on from past few years. ▪ The 17 projects, including 11 of critical minerals granted to the five NPEAs are located in Maharashtra, Madhya Pradesh, Chhattisgarh, Odisha, Gujarat and Karnataka. ▪ A total of Rs 15.88 crore have also been sanctioned from NMET funds, as per the Ministry.
22	Drone Survey for Quarries and Sand Mines	▪ The State has adopted the Drone based survey for major as well as minor minerals including sand mining blocks. ▪ Leveraging its state-of-the-art drone technology, Garuda Aerospace has introduced its specialised large scale mapping drones - Bhumi and Vayu that are integrated with artificial intelligence (AI) and machine learning (ML), making way for a more enhanced digitised mapping exercise.
23	GO – SWIFT Single Window for Investor Facilitation & Tracking	▪ Approval process for 52 services from 18 State Government departments has been made online for submission, payment, tracking and processing
24	DMF Portal	▪ Total Accrual - ₹ 23,737.60 Cr ▪ Total Number of Projects - 30,070 ▪ Total Allocation - ₹ 19,774.19 Cr ▪ Total Expenditure - ₹ 1,826.71 Cr
25	Water Sanitization	▪ Total Number of Projects - 364 ▪ Total Allocation - ₹ 39.13 Cr ▪ Total Expenditure - ₹ 3.08 Cr
26	Zero waste initiative	▪ The initiative has led to a considerable increase in the processing of organic waste through micro-composting centres (MCCs), with nearly 96% of wet waste being processed. Additionally, 100% of dry waste is successfully directed to material recovery facilities (MRFs) for recycling

Summary of Initiatives & Recommendations - Odisha (4/4)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Odisha						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Sustainable Mining Practices

- Other states have adopted other initiatives:
- M-Sand Policy
- Star Rating of Minor Minerals
- Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development

Technology, research and development

- Other states have adopted other initiatives:
- Mine Surveillance system
- These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.

Mine closure, waste management , reclamation and rehabilitation

- Other states have adopted the initiatives:
- Management of Abandoned mines
- Dumping of Overburden and waste outside the lease area for Minor minerals
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

For more information, visit the following website: *Department of Steel and Mines, Goverenment of Odisha*

5.4 State-wise initiatives and outcomes

18.Punjab

Punjab Mineral Scenario

- Punjab is also home to a variety of mineral resources that play a vital role in its industrial growth. The state's mineral resources are not as extensive or diverse as those of some other mineral-rich states like Odisha or Jharkhand, but they still support key industries, particularly in construction, cement production, and agriculture.
- The mineral scenario in Punjab is characterized mainly by non-metallic minerals, which are essential for the production of materials like cement, building stones, and fertilizers. Key minerals found in the state include limestone, salt, gypsum, and some other industrial minerals.
- These minerals are critical to supporting the state's thriving cement industry, which has become one of the main pillars of Punjab's economy. Additionally, Punjab's mineral resources help meet the needs of its agricultural sector, with minerals like gypsum and salt used to enhance soil quality and improve crop yields.
- While the state's mineral sector is not as dominant as its agricultural sector, it still plays a vital role in Punjab's industrial activities and overall economic development. The presence of mineral deposits has led to the establishment of cement plants, salt industries, and construction materials, providing employment and contributing to the state's revenue.

What's going on so far...

- One of the major issues in Punjab's mining sector is illegal mining. Despite efforts by the government to curb these activities, illegal mining continues to be a problem, leading to environmental degradation and loss of revenue for the state.
- The state government has implemented various regulatory measures to control mining activities. This includes stricter enforcement of mining laws, regular inspections, and the use of technology to monitor mining operations.
- Mining, particularly of sand and gravel, plays a crucial role in the construction industry in Punjab. It provides raw materials for infrastructure projects, contributing to the state's economic growth.
- There is a growing emphasis on adopting sustainable mining practices. This includes measures to minimize environmental impact, such as reclamation of mined land and reducing pollution.
- The use of advanced technologies like GPS tracking, drones, and automated machinery is expected to improve efficiency and reduce illegal mining activities.
- The government is likely to introduce more policy reforms aimed at making the mining sector more transparent and accountable. This could include stricter penalties for illegal mining and incentives for companies that adopt sustainable practices.
- Increasing community involvement in mining activities can help in better monitoring and reporting of illegal activities. It also ensures that the benefits of mining are shared with local communities.

Best Practices adopted by Punjab

Thematic Area: Technology, research and development

1 Public Mining Sites (PMS)

Launched under the Punjab State Minor Mineral Policy 2023, these sites are designed to regulate and promote sustainable mining practices. They allow the public to extract sand using hand tools and personal labor, ensuring that mining activities are conducted in an environmentally friendly and controlled manner. This approach not only helps in conserving natural resources but also encourages community involvement and adherence to sustainable practices.

Features and Highlights:

- Employment Generation: Creates job opportunities through sustainable mining practices.
- Price Stabilization: Helps maintain stable prices for sand by regulating supply.
- Enhanced Transparency: Improves transparency in mining operations and transactions.

Outcomes

- At present, 60 public mining sites are operational in different districts. Collectively, 15.90 lakh metric tonnes of sand has been extracted at ₹5.50 per cubic feet by the general public till date
- Punjab mining and geology minister Chetan Singh Jauramajra will dedicate 12 new public mining sites in five districts – Ferozepur, Nawanshahr, Amritsar, Moga and Jalandhar

Source: State Ministry information received and secondary research

2 UAV Survey of Sand Mines

Punjab has integrated Unmanned Aerial Vehicles (UAVs) into its sand mining operations to enhance monitoring, ensure compliance, and promote environmental conservation. By utilizing UAVs, the state can conduct more precise and frequent inspections of mining sites, detect unauthorized activities, and assess environmental impacts more effectively. This technological advancement helps in maintaining sustainable mining practices and protecting natural resources.

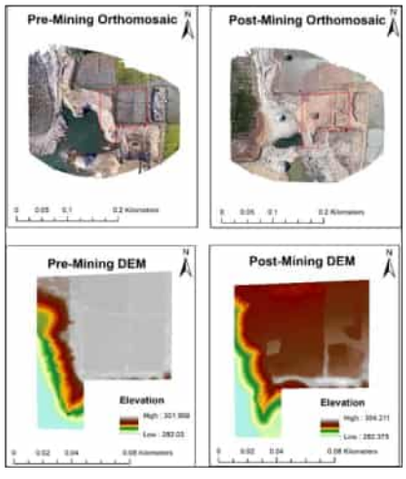
Features and Highlights:

- Monitor Mining Activities: Detect illegal activities and ensure compliance.
- Data Collection and Analysis: Accurate topographical mapping and resource estimation.
- Transparency and Accountability: High-resolution data shared via digital platforms.
- Pre and Post Mining Surveys: Conducted to measure the exact quantity mined.
- Accountability: Ensures contractors adhere to allotted quantities

Outcomes

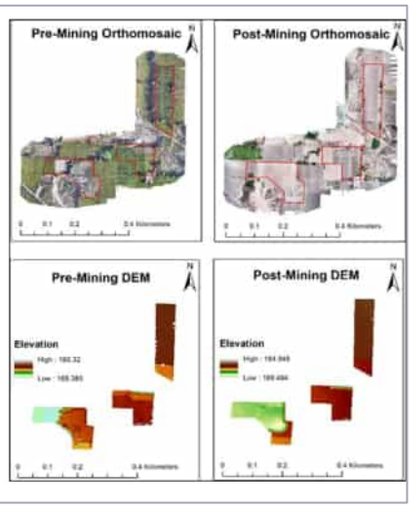
- IIT Ropar surveyed the periphery outside approved mining areas and investigated unauthorized mining in some locations. The final data processing is underway, with results expected by December 15, 2024.

Naushera, Hoshiarpur



Volume mined: 5663.61 m^3

Sukhera, Fazilka



Volume mined: 2225.83 m^3

Summary of Initiatives & Recommendations - Punjab (1/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Punjab						

S.No.	Initiative adopted	Impact from adoption of Initiative
1	UAV Survey of Sand Mines	▪ IIT Ropar surveyed areas outside approved mining zones for unauthorized mining. Final data processing is underway, with results expected by December 15, 2024.
2	Public Mining Sites (PMS)	▪ Currently, 60 public mining sites are operational, with 15.90 lakh metric tonnes of sand extracted at ₹5.50 per cubic foot. ▪ Punjab mining minister Chetan Singh Jauramajra will dedicate 12 new public mining sites in Ferozepur, Nawanshahr, Amritsar, Moga, and Jalandhar.

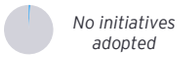
Recommendation

Mineral Administration and Mineral Concession	▪ Other states have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	▪ Other states have been actively pursuing initiatives: ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Sustainable Mining Practices	▪ Other states have adopted other initiatives: ▪ M-Sand Policy ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development
Technology, research and development	▪ Other states have adopted other initiatives: ▪ Mine Surveillance system ▪ Drone Survey of Quarries ▪ E-Check gate implementation ▪ Sand Mine Portal ▪ These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.
Social project implementation	▪ Other states have adopted other initiatives: ▪ DMF Portal ▪ Upgradation of Healthcare services ▪ District Mineral Foundation ▪ These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Summary of Initiatives & Recommendations - Punjab (2/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Punjab						



Recommendation

Mineral Administration and Mineral Concession

- Other states have adopted the initiatives:
- Management of Abandoned mines
- Dumping of Overburden and waste outside the lease area for Minor minerals
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Exploration and Mines development

- Other states have adopted the initiatives:
- Human Resource Development
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

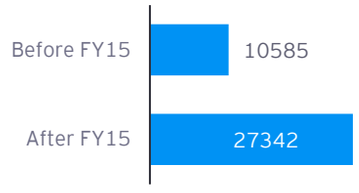
For more information, visit the following website: *Mineral Sale Management and Monitoring System*

5.4 State-wise initiatives and outcomes

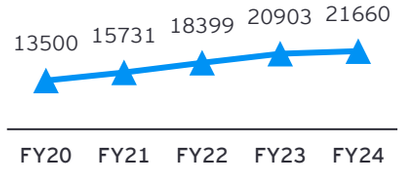
19. Rajasthan

Rajasthan Mineral Scenario

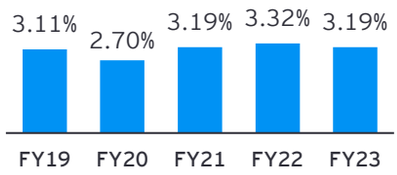
(Revenue Pre & Post Auction), INR Cr



Value of mineral production, INR Cr



Mining contribution (%) to State GDP



What's going on so far...

- Rajasthan, located in the northwestern region of India, is one of the country's most mineral-rich states. The state's mineral wealth has been a cornerstone of its economy for centuries, contributing significantly to both its industrial development and national growth.
- Known for its vast and varied mineral resources, Rajasthan has emerged as one of India's leading producers of a wide range of minerals, including non-metallic minerals like limestone, marble, and gypsum, as well as metallic ores such as zinc, lead, copper, and others.
- Rajasthan's mineral deposits are spread across its diverse geographic regions, from the arid Thar Desert in the west to the fertile plains in the east and are vital to several key sectors, including cement production, construction, steel manufacturing, and the electrical and electronics industries.
- The mining sector in Rajasthan is a major driver of both industrial growth and employment, offering direct and indirect job opportunities to millions of people, particularly in rural and semi-urban areas

What's going on so far...

- The state of Rajasthan has put together a plan of policies and framework that are expected to support streamlined and sustainable mining operations and resolve issues around resource conservation, decarbonization AI-driven innovations, and renewable energy to reshape the mining sector.
- The industry provides employment to over 35 lakh people and is working towards implementing new changes and encourage mining units through benefits provisions under Rajasthan Investment Promotion Scheme 2024.
- Incorporating these changes is expected to boost resource security and drive sustainable exploration to achieve India's goal of self-reliance and resource future in mining sector

Best Practices adopted by Rajasthan

1.Thematic area: Mineral Administration

1 Post Auction Facilitation Cell Establishment (PAFC):

The primary objective of the PAFC is to provide a structured, streamlined process for managing and facilitating all activities and legal requirements following the auction of mineral resources. These include the allocation of mining leases, compliance with statutory obligations, obtaining necessary clearances, and assisting miners with various post-auction formalities

Highlights:

- The state established this cell to facilitate preferred bidders for both Minor and Major Minerals.
- Two separate Nodal Officers appointed for both minor & major minerals
- The nodal officers facilitate the preferred bidders to apply and procure necessary approvals, clearances and no objections from various departments.
- Coordinated with revenue department and NoC for Charagarh land obtained in one case, one another case processed from Collector Sikar to Revenue Department and issuance of NoC is under process in one case

Outcomes :

- Average time taken in issuance of ToR as reduced from **20 days to 10 days**.
- This Cell caused **issuance of TOR in 3 matters of major minerals and TOR** in 17 **LoI of auctioned plots** of bajri from SEIAA.
- This Cell **accelerated approval of 12 mining plans of major mineral** and **200 mining plans of minor minerals**.
- No. of EDS/ADS reduced in re-appraisal cases of EC due to better coordination.

Source: State Ministry information received and secondary research

2 Online e-permit management system

Rajasthan's Department of Mines & Geology offers an online e-permit system for mining activities. This system allows users to apply for various permits and licenses, including eRawanna/Transit-Pass details, mining leases, and more. These digital solutions have transformed the way mineral transportation is managed.

Highlights:

- Weighbridges empanelled for generation of E-Rawanna and E-TP
- Miners and transporters can now resort to obtaining permits online instead of traditional physical paper-based permits
- Applicants can track the status of their permit applications and receive updates through SMS, email, or the portal
- This process can save time and reduced the administrative burden associated with issuing and tracking physical permits

Outcomes :

- E-Rawanna system started in 2017 and 99 Lacs+ e Rawanna issued so far.
- E-Payment system and E-Assessment of mining leases started in 2017
- For mineral rehandling Transit Pass system, 52 lacs + e TP issued so far since 2019
- Alerts to ME for dispatch of more than 30 vehicles in a day from a lease

3 Minor Mineral plots auction

The Rajasthan Department of Mines and Geology regularly conducts e-auctions for minor mineral-bearing areas. These auctions are managed through the MSTC E-Commerce platform. The latest auctions include plots for various minerals such as masonry stone and sandstone in regions like Jodhpur, Tonk, and Chittorgarh

Highlights:

- Aimed to ensure transparency and efficiency in allocation of mining lease
- Dedicated online portal provides a user-friendly interface for registering, bidding, and accessing auction-related data
- This process saved time and reduced the administrative burden associated with issuing and tracking physical permits

Outcomes :

- The state has so far auctioned **1980** minor mineral plots after RMMCR 2017 in **3880.7 Hect**., premium amount to be received – Rs. 1,982 Crore
- In FY 2024-25, the State successfully auctioned **592** plots in **11,634 Hect**., premium amount to be received – Rs. 1242.50 Crore
- The State auctioned successfully **93 plots** for Bajri in FY 2024-25

4 Reappraisal of EC from SEIAA granted by DEIAA):

The Rajasthan State Environment Impact Assessment Authority (RSEIAA) has been reconstituted to facilitate timely renewal of environmental clearances in the state through state appointed committees which are expected to help the state authority with mandatory clearances for mining and other environmentally impactful activities based on recommendations from respective appraisal committees

Highlights:

- Reconstitution of the RSEIAA and state authorities to ensure continued mining operations employing over 1.5 million workers
- Mining leaseholders operating on district level approvals can now seek state level environment clearances

Outcomes :

- The state facilitated the lease holders with reappraisal of EC by SEIAA granted by DEIAA
- 22,000 ECs granted by DEIAA and out of which FORM-2 for 12000 applications uploaded on Parivesh portal by department for EC by DEIAA and 1000 EC granted so far
- Nodal officer also appointed to facilitate the leases

Thematic Area: Mineral Exploration

5 Establishment of Rajasthan State Mineral Exploration Trust in 2020 (RSMET):

Objective of RSMET is to take up regional and detailed exploration giving priority to higher value minerals in state, to facilitate the process of mineral exploration and assessment of mineral resources, to undertake activities of mineral development sustainable mining adoption of advanced scientific and technological practices and mineral extraction metallurgy, to facilitate geophysical ground and aerial survey and geochemical survey of the obvious geological potential areas and develop mineral Atlas for the entire state of Rajasthan, to organise capacity building programmes to raise technical capability of personnel engaged in or to be engaged in exploration, such other purposes that the Governing Body may decide or authorise Executive Committee to be necessary or expedient in the interest of conservation, development and Exploitation of mineral resources in State.

Highlights:

- Initiate action to strengthen and upgrade the department laboratory and provide impetus to research and development
- 2% of royalty from minor minerals is collected for RSMET fund
- Videos, brochures, presentations of various e-auction blocks are being prepared and publicity through social media. Coffee booklet of Geo-heritage sites of Rajasthan and a panoramic illustrative video prepared on Geo-Heritage sites of the state.

Outcomes :

- **Central Laboratory - Chemical analysis of 17,271** core and spot samples related to departmental exploration pending since the year 2017-18 and procurement of Chemical reagents, equipment etc.
- To prepare e-auction blocks of mineral Limestone and Iron Ore, **18,296 meters of core drilling has been done in district Bhilwara, Jodhpur, Rajsamand, Jhunjhunu**.
- To prepare e-auction blocks for minerals Copper, Gold, Lead and Zinc, **5,854 meters core drilling has been done in district Chittorgarh, Rajsamand and Bhilwara**.
- Resource enhancement by RSMET – **3 Blocks enhanced from G4 to G2 and 2 Blocks from G3 to G2**
- No. of blocks in which RSMET worked and proposed for auction is **105**.
- Total collection in RSMET Fund till Nov-24 is **Rs. 178.35 Crore** and Drilling done is **26,164 Mt**
- RSMET is preparing **8 Pre embedded blocks** of major minerals
- **5 Mining plan of blocks** JMK01, JMK02, JMK06, JMK07, JMK08 approved from Indian Bureau of Mines, Ajmer
- **21 G-2 level mining lease blocks** have been prepared for Mineral Limestone n/v Harima, Pithasar, Somana Tehsil Nagaur and Deh District Nagaur.
- **51 G-2 level mining lease blocks** have been prepared for Mineral Limestone n/v Tadas, Khodwa Tehsil Khivsar District Nagaur.
- **11 G-2 level mining lease blocks** have been prepared for Mineral Limestone n/v Nimbol, Bogasani, Sinla Tehsil Jaitaran District Beawar.

6 Collaboration with PSUs

Rajasthan is collaborating with Public Sector Undertakings (PSUs) for mineral exploration to leverage their expertise and resources. This collaboration aims to accelerate the exploration and development of the state's abundant mineral resources, including gold, silver, lead, zinc, marble, and granite.

Highlights:

- MECL, RSMML and DMG sign tripartite agreement for harnessing potash in Rajasthan
- Oil India Limited and RSMML Sign MoU to Enhance Collaboration on Critical Minerals and Energy Exploration

Outcomes

- Tripartite agreement creating import substitution by way of boosting the domestic mineral production of Potash and associated minerals
- Collaboration to enhance exploration and utilization of Critical Minerals, Underground Lignite Gasification, Coal Bed Methane

Thematic area: Sustainable mining practices

7 M-Sand Policy

The M-Sand Policy 2024 aims to incentivize M-Sand units, simplify regulations, and promote quality standards. It aims to ensure environmental protection, foster economic growth, and support community well-being, contributing to Rajasthan's sustainable development. This policy was introduced to encourage the usage of sand (M-Sand) and reduce pressure on the state's riverbeds from sand mining and the state government is expected to offer incentives to establish these units, streamline their operations to make them investor friendly

Highlights:

- Minimize harm to river ecosystems by managing use of river sand judiciously, decreasing reliance and offering simple and affordable substitute
- Increase existing M-sand production by 20% every year, targeting 30 million tonnes per annum by 2028-29
- Promote sustainable and eco-friendly mining practices and recycling of the coarse and fine aggregates in construction and demolition waste of building/concrete structures in the State.
- Promote M-Sand industry and simultaneously develop opportunities for employment at local level

Outcomes

- **16 M-Sand production units** are operating from the last 3 years
- **M-Sands units procure raw minerals from which about Rs. 80 Crores revenue** is collected annually.
- Relaxed eligibility to establish units by removing a 3-year experience requirement and the condition of INR 3 Cr turnover

8 Regulation of Bajri (River Sand) Mineral Concession

Efforts to be made for auctioning maximum number of blocks of various sizes to meet the local demand. Create a Sand portal to connect producer and the end user to transfer the direct benefit of sale price of Bajri and to curb illegal Bajri mining. Review of post auction execution of concession deeds with respect to environment clearance requirements.

Highlights:

- Bajri Plots allocated to the State PSU – RSMML
- Bajri replenishment study being done by department of Mines & Geology for early operationalization of plots

Outcomes

- The State has auctioned 460 minor mineral plots and 108 Bajri plots in 2024-25
- Created online portal for Bajri purchase

9 Star Rating of Minor Minerals

Rajasthan has implemented the Star Rating system for minor minerals to promote sustainable and eco-friendly mining practices. This initiative is part of the state's broader efforts to conserve natural resources and ensure responsible mining. The system evaluates mining leases based on criteria such as environmental protection, water conservation, worker health and safety, community engagement, and statutory compliance

Highlights:

- Aims to evaluate mines based on parameters including mining operations, environment related parameters, adoption of technologies and economic performance among others
- Other evaluation parameters include rehabilitation and resettlement and labor compliance safety and security

Outcomes

- Fostered competitiveness among mines and recognize their performances based on compliances
- Facilitated adoption of mining technology and economic achievements

10 Best Sustainable Mining Practices adopted by RSMML

Highlights:

- Aims to evaluate mines based on parameters including mining Upgraded low-grade rock phosphate (16% P_2O_5) to high-grade (31.5% P_2O_5), by beneficiation
- M-sand Manufacturing using overburden

Thematic area: Social Project Implementation

11 DMF Portal

State government vide notification dated 31-05-2016, enacted DMFT Rules, 2016 to establish district mineral foundation trust in each district of the state as a non-profit body in the mining operation affected districts. In all 33 districts District Mineral Foundation Trust has been established in the state.

Highlights:

- The objective of District Mineral Foundation is to work for the interest of the benefit of the persons and areas affected mining-related operations in such manner as may be prescribed by the State Government.
- Every holder of a mining lease or a prospecting licence-cum-mining shall, in addition to the royalty, pay to District Mineral Foundation of the district in which the mining operations are carried on, an amount at the rate of-
  - Ten per cent of the royalty paid in terms of the Second Schedule to the Mines & Minerals (Development and Regulation) Act, 1957 (67 of 1957) (herein referred to as the said Act) in respect of mining leases or, as the case may be, prospecting licence-cum-mining lease granted on or after 12th January 2015; and
  - Thirty per cent of the royalty paid in terms of the Second Schedule to the said Act in respect of mining leases granted before 12th January 2015

Outcomes (As of Nov'24)

- Total collection – **Rs. 10,493.72 Cr.**
- No. of financial sanctioned projects – **19,248**
- Amount of financial sanctioned projects (As on Nov 24) – **Rs. 7,833.11 Cr**.
- Total Expenditure – **Rs. 5,013.71 Cr**.

12 Pneumoconiosis Policy

Pneumoconiosis Policy launched in 2019. The State of Rajasthan has been pioneer in setting up institutional mechanisms for detection of Pneumoconiosis and providing payment of relief to the affected workers as per the administrative instructions and circulars

Highlights:

- Rs 3 lakh per patient and Rs 2 Lakh to legal heirs of every deceased is being disbursed.
- 47 health checkup camps and 26 silicosis awareness camps organized in 2023-24, 1702 persons diagnosed, 128 persons found symptomatic and referred to hospitals

Outcomes (As of Nov'24)

- A total of **1,05,000 people were examined** through mobile Pneumoconiosis Van. Out of which **1123 people were found to be Pneumoconiosis** positive and were treated.
- From 2018-19 to 2023-24, **Rs. 274 Crores disbursed to 13,364 patients** and **Rs. 84 Crores disbursed to legal heirs of 3301 deceased patients**.

13 Other social initiatives:

Highlights & Outcomes :

1. School Education:

Purchase of UPS with 5 computers in each school in total 152 government schools of Hanumangarh District. Total amount sanctioned is Rs. 1.40 Cr., total amount spent is Rs. 1.39 Cr. and total beneficiaries are 35,000 students

2. Animal Husbandry:

Sex sorted Semen was tested on a total of 20,000 animals, of which 6,782 (female calves) showed positive results in Bhilwara District

3. Irrigation:

Reconstruction and strengthening work of Balera Dam in Barmer District, where the approved amount is Rs. 1.95 Cr. and 15 villages are benefited

4. Forestry and Nursery Development:

9 lakh plants prepared, and the activities involved the construction of permanent beds, GLR & seed store

5. Flexi Biogas Plant – 2 m3 Capacity:

Beneficiary will not have to buy LPG gas cylinders, which will save Rs. 1200/- per month per person. 80 Kg slurry is produced daily and Slurry will be purchased from the farmers at 75 paise to Rs. 1 per kg. 17-18 thousands beneficiaries have been benefitted.

6. District Library:

Rs. 5.79 Cr. Sanctioned for Savitri Bai Phule District Library, set to benefit around 300 students per day

7. Legacy waste segregation machine with JCB tractor in Hanumangarh

Total amount sanctioned is Rs. 66.50 lakhs and total amount spent is Rs. 62.865 lakhs

8. Drinking water supply

3.33 cr Sanctioned for water supply pipeline. It will benefit 7000 persons across 1654 households

9. Sports stadium

Construction of 99 sports stadiums in the Gram Panchayats /Municipal Bodies in Chittorgarh district with approx. 24750 beneficiaries per day

10. Menstrual Hygiene : Establishment of Incinerator

Establishment of incinerator in total 521 government schools of Hanumangar, with 55,000 girls benefiting from the initiative. Total sanctioned amount is Rs 65.13 Lakhs of which 56.37 Lakhs is spent.

11. College Education

Establishment of Government college, railmagra in Rajsamand district to benefit 700 students per year

Thematic area: Technology, research and development

14 Drone Survey for Quarries and Sand Mines

Starting Apr 1, 2025 all minor mineral leaseholders will be required to conduct drone or aerial survey of their lease areas and the surrounding 100 metres. The data obtained through a volumetric assessment is expected to outline three major discrepancies in the sector which include issuing fewer mineral dispatch permits than the actual production and dispatch from authorized areas, issuing permits for areas outside authorized zones, and conducting illegal mining in areas adjacent to lease zones.

Highlights:

- To provide relief to leaseholders of minor mineral mines through volumetric assessment
- Area of all leases are covered under drone survey.
- Volumetric assessment are designed to address penalties caused by discrepancies in mining leases

Outcomes (As of Nov'24)

- All major minerals and minor minerals leases are covered under drone survey. Major mineral leases are covered under Mineral Conservation and Development (Amendment) Rules, 2021. Minor mineral leases are covered under Rajasthan Minor Mineral Concession (Amendment) Rules, 2024.
- Base Daily Cost incurred for the operations of the drone survey: Rs. 5,000 (includes deployment of one drone pilot, one assistant, one drone, and one DGPS unit)

15 Central Control Room for illegal mining

This initiative aims to enhance enforcement efforts by providing real-time data and insights, thereby promoting sustainable resource management and protecting the environment.

Highlights:

- Can monitor illegal mining initiatives and utilizes advanced technologies such as satellite remote sensing and surveillance systems to track and prevent unauthorized mining activities.

Outcomes (As of Nov'24)

- So, far 700+ information received and resolved

Summary of Initiatives & Recommendations - Rajasthan (1/3)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Rajasthan						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1.	Post Auction Facilitation Cell Establishment (PAFC)	▪ Average time taken in issuance of ToR as reduced from 20 days to 10 days. ▪ This Cell caused issuance of TOR in 3 matters of major minerals and TOR in 17 LoI of auctioned plots of bajri from SEIAA. ▪ This Cell accelerated approval of 12 mining plans of major mineral and 200 mining plans of minor minerals. ▪ No. of EDS/ADS reduced in re-appraisal cases of EC due to better coordination.
2.	Online e-permit management system	▪ E-Rawanna system started in 2017 and 99 Lacs+ e Rawanna issued so far. ▪ E-Payment system and E-Assessment of mining leases started in 2017 ▪ For mineral rehandling Transit Pass system, 52 lacs + e TP issued so far since 2019 ▪ Alerts to ME for dispatch of more than 30 vehicles in a day from a lease
3.	Minor Mineral plots auction	▪ The state has so far auctioned 1980 minor mineral plots after RMMCR 2017 in 3880.7 Hect., premium amount to be received – Rs. 1,982 Crore ▪ In FY 2024-25, the State successfully auctioned 592 plots in 11,634 Hect., premium amount to be received – Rs. 1242.50 Crore ▪ The State auctioned successfully 93 plots for Bajri in FY 2024-25
4.	Reappraisal of EC from SEIAA granted by DEIAA)	▪ The state facilitated the lease holders with reappraisal of EC by SEIAA granted by DEIAA ▪ 22,000 ECs granted by DEIAA and out of which FORM-2 for 12000 applications uploaded on Parivesh portal by department for EC by DEIAA and 1000 EC granted so far ▪ Nodal officer also appointed to facilitate the leases
5.	Establishment of Rajasthan State Mineral Exploration Trust in 2020 (RSMET)	▪ Resource enhancement by RSMET – 3 Blocks enhanced from G4 to G2 and 2 Blocks from G3 to G2 ▪ No. of blocks in which RSMET worked and proposed for auction is 105. ▪ Total collection in RSMET Fund till Nov-24 is Rs. 178.35 Crore and Drilling done is 26,164 Mt ▪ RSMET is preparing 8 Pre embedded blocks of major minerals
6.	Collaboration with PSUs	▪ Tripartite agreement creating import substitution by way of boosting the domestic mineral production of Potash and associated minerals ▪ Collaboration to enhance exploration and utilization of Critical Minerals, Underground Lignite Gasification, and Coal Bed Methane
7.	M-Sand Policy	▪ 16 M-Sand production units are operating from the last 3 years ▪ M-Sands units procure raw minerals from which about Rs. 80 Crores revenue is collected annually. ▪ Relaxed eligibility to establish units by removing a 3-year experience requirement and the condition of INR 3 Cr turnover
8.	Regulation of Bajri (River Sand) Mineral Concession	▪ The State has auctioned 460 minor mineral plots and 108 Bajri plots in 2024-25 ▪ Created online portal for Bajri purchase
9.	Star Rating of Minor Minerals	▪ Fostered competitiveness among mines and recognize their performances based on compliances ▪ Facilitated adoption of mining technology and economic achievements
10.	Best Sustainable Mining Practices adopted by RSMML	▪ Upgraded low-grade rock phosphate (16% P2O5) to high-grade (31.5% P2O5), by beneficiation ▪ M-sand Manufacturing using overburden
11.	DMF Portal (Outcomes as of Nov'24)	▪ Total collection – Rs. 10,493.72 Cr. ▪ No. of financial sanctioned projects – 19,248 ▪ Amount of financial sanctioned projects – Rs. 7,833.11 Cr. ▪ Total Expenditure – Rs. 5,013.71 Cr.

Summary of Initiatives & Recommendations - Rajasthan (2/3)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Rajasthan						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
12.	Post Auction Facilitation Cell Establishment (PAFC)	▪ A total of 1,05,000 people were examined through mobile Pneumoconiosis Van. Out of which 1123 people were found to be Pneumoconiosis positive and were treated. ▪ From 2018-19 to 2023-24, Rs. 274 Crores disbursed to 13,364 patients and Rs. 84 Crores disbursed to legal heirs of 3301 deceased patients.
13.	Online e-permit management system	**1. School Education:** ▪ Purchase of UPS with 5 computers in each school in total 152 government schools of Hanumangarh District. Total amount sanctioned is Rs. 1.40 Cr., total amount spent is Rs. 1.39 Cr. and total beneficiaries are 35,000 students **2. Animal Husbandry:** ▪ Sex sorted Semen was tested on a total of 20,000 animals, of which 6,782 (female calves) showed positive results in Bhilwara District **3. Irrigation:** ▪ Reconstruction and strengthening work of Balera Dam in Barmer District, where the approved amount is Rs. 1.95 Cr. and 15 villages are benefited **4. Forestry and Nursery Development:** ▪ 9 lakh plants prepared, and the activities involved the construction of permanent beds, GLR & seed store **5. Flexi Biogas Plant – 2 m3 Capacity:** ▪ Beneficiary will not have to buy LPG gas cylinders, which will save Rs. 1200/- per month per person. 80 Kg slurry is produced daily, and Slurry will be purchased from the farmers at 75 paise to Rs. 1 per kg. 17-18 thousands beneficiaries have been benefitted. **6. District Library:** ▪ Rs. 5.79 Cr. Sanctioned for Savitri Bai Phule District Library, set to benefit around 300 students per day **7. Legacy waste segregation machine with JCB tractor in Hanumangarh** ▪ Total amount sanctioned is Rs. 66.50 lakhs and total amount spent is Rs. 62.865 lakhs
14.	Minor Mineral plots auction	▪ All Major Minerals and Minor Minerals leases are covered under drone survey. Major mineral leases are covered under Mineral Conservation and Development (Amendment) Rules, 2021. Minor mineral leases are covered under Rajasthan Minor Mineral Concession (Amendment) Rules, 2024. ▪ Base Daily Cost incurred for the operations of the drone survey: Rs. 5,000 (includes deployment of one drone pilot, one assistant, one drone, and one DGPS unit)
15.	Reappraisal of EC from SEIAA granted by DEIAA)	▪ So, far 700+ information received and resolved

Summary of Initiatives & Recommendations - Rajasthan (3/3)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Rajasthan						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Mineral Administration and Mineral Concession	Other states have adopted other initiatives: ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	Other states have been actively pursuing initiatives: ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Technology, research and development	Other states have adopted other initiatives: ▪ Mine Surveillance system ▪ E-Check gate implementation ▪ Sand Mine Portal ▪ These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.
Social project implementation	Other states have adopted other initiatives: ▪ Mines and Mineral Restoration and Rehabilitation Fund ▪ These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .
Mine closure, waste management , reclamation and rehabilitation	Other states have adopted the initiatives: ▪ Management of Abandoned mines ▪ Dumping of Overburden and waste outside the lease area for Minor minerals ▪ These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.
Skilling and Capacity Building	Other states have adopted the initiatives: ▪ Human Resource Development ▪ This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

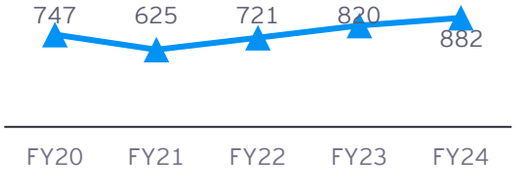
For more information, visit the following website: *Department of Mines & Geology*

5.4 State-wise initiatives and outcomes

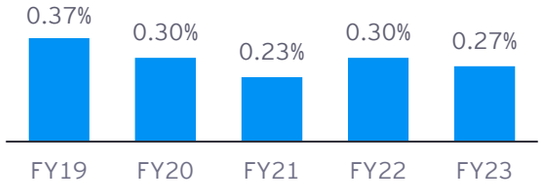
20. Tamil Nadu

KPIs so far....

Value of mineral production, INR Cr



Mining contribution (%) to State GDP



Tamil Nadu Mineral Scenario

- Tamil Nadu, located in the southern part of India, is endowed with a wealth of mineral resources due to its diverse geological formations, ranging from the Precambrian to recent sedimentary deposits. The state's mineral landscape plays a pivotal role in its industrial development, contributing significantly to sectors such as construction, cement, energy, and manufacturing. Tamil Nadu's coastline, mountainous terrains, and fertile plains further enhance its mineral diversity, positioning it as one of India's prominent contributors to mining activities
- As per National Mineral Inventory as on 01.04.2020, Tamil Nadu is the leading holder of country's resources of vermiculite, molybdenum, rutile, garnet, and ilmenite. The State accounts for the country's 79% vermiculite, 46% garnet, 66% molybdenum, 34% magnesite, 27% titanium minerals, 24% sillimanite, 8% PGM and 5% each graphite & iron (magnetite) resources.

What's going on so far...

- Tamil Nadu saw mixed results across its minerals. Limestone production increased by 9%, contributing 6% to the national total. Graphite production grew by 46%, while vermiculite production experienced a 100% increase from the previous year
- marl production fell by 11%, and the state's magnesite production, despite a 26% rise in quantity, showed only modest growth in value. The number of mines in Tamil Nadu that submitted MCDR returns during 2023-24 is 222
- Tamil Nadu is the only state in India to have all its districts covered under industrial corridor projects. It is aimed at development of futuristic industrial cities in Tamil Nadu which can compete with the best manufacturing and investment destinations in the world.
- Tamil Nadu's Primary sector (consisting of agriculture crops, forestry, and mining and quarrying) grew at an average rate of 4.95 percent from 2012-13 to 2022-23.

Best Practices adopted by Tamil Nadu

Thematic area - Sustainable Mining practices

1 M-Sand Policy

The Tamil Nadu government has introduced a policy to regulate quarries of manufactured sand (popularly known as M-sand) in the state. The policy aims to improve the quality of M-sand, a type of crushed sand that is used as a construction aggregate, and regulate the quarries

As of March 2023, there were 378 licensed crushed stone sand manufacturing units in the state, while many other quarries are operating without licences.

Highlights:

- A single-window portal and a centralised system to monitor the activities of M-sand and crushed sand units
- As per the new policy, the pollution control board, public works department, mines, and other departments will be merged to ensure that quarry owners receive speedy clearance for their licences
- All crusher units must be registered with the Directorate of Industrial Safety and Health. The standalone units will be allowed to operate if they meet the criteria of the state pollution control board.

Outcomes (As of Nov'24)

- The single-window portal and centralised monitoring system will make it easier for quarry owners to obtain licences and clearances, while also ensuring that the quality of M-sand meets the prescribed standards.
- The new policy is expected to bring more regulation and transparency to the M-sand industry
- It is expected to improve the quality of M-sand with greater compressive strength adhering to BIS prescribed standard
- Promotes zero waste mining/quarrying in the state

Source: State Ministry information received and secondary research

Thematic Area: Technology, research and development

2 Mining Tenement System

Mining Tenement System for minor minerals involves automation of the entire mineral concessions, life cycle starting from application stage to closure of mines. The system will enable the applicants to track the status of the applications. To implement the online system for Mining Tenement System, the said work was entrusted to Tamil Nadu e-Governance Agency

Features and Highlights of the system:

- Comprehensive database of mining tenements in mineral bearing areas in various districts. The registry will also provide satellite images of cities and villages with survey numbers along with details of mining leases.
- The registry will provide satellite images of cities and villages with survey numbers along with details of mining leases.
- MTS enables spatial visualization of mining tenements. This aids in better planning, monitoring, and management of mineral resources

Outcomes (As of Nov'24)

- Monitoring via satellite imagery will help the district administration keep a close watch on the boundaries of mineral bearing areas and
- During the FY 23-24 till November, 2023, a total of 427 Nos. of registration for different business domains has been carried out in the portal
- Up to October, 2023, 8086 Miners, 5437 End Users, 10392 Traders, 2937 Stockiest, 1610 Exporters have registered online

3 DGPS and Drone Survey Technology:

Tamil Nadu has been incorporating advanced technologies like DGPS (Differential Global Positioning System) and drone surveys into its mining and infrastructure management to improve efficiency. DGPS is used for accurate mapping of mineral reserves, land boundaries, and mining sites. It provides real-time corrections to GPS data, ensuring centimetre-level precision.

Key Features and Highlights

- Twenty-three agencies have been empanelled for conducting Differential Global Positioning System (DGPS) surveys for the existing/proposed mines/quarries to demarcate the lease area
- In order to prevent illicit mining/quarrying in the State, the Government has sanctioned an amount of Rs. 25 crore as recurring expenditure for measuring the volume and extent analysis of the mines and quarries using drones

Outcomes

- DGPS surveys have been completed in 1,132 mines/quarries.
- In the first phase, drone surveys have been completed in 200 quarries, and the reports are under scrutiny by Tamil Nadu Unmanned Aerial Vehicle Corporation

4 Minera l Management System (MiMaS):

The Mineral Management System (MiMaS) is an online platform being developed by the Tamil Nadu government to enhance the management and monitoring of mining activities within the state. This initiative aims to streamline operations, improve transparency, and ensure compliance with regulations in the mining sector.

Features and Highlights of the system

- The development of software for Mineral Management System was entrusted to the Tamil Nadu e-Governance Agency
- Initially, the e-permit system for obtaining bulk permits has been launched on trial basis in Chengalpattu and Kancheepuram districts.
- Action is being taken to enable generation of e-dispatch slips on security paper by the lessees, for which printing of paper with security features has been entrusted to the Government Printing Press.

Outcomes

- The Government have accorded sanction for an amount of Rs. 3.78 crore for issuing e-permits with security feature for transporting minerals.
- TNeGA has developed 16 mineral concession modules which facilitates online receipt quarry lease applications, tracking of lease applications, scrutinizing and granting of lease applications.

Thematic Area: Mine closure, waste management , reclamation and rehabilitation

5 Green Fund for reclamation, restoration, re-habilitation of Abandoned Quarries:

The State Government created a separate fund for reclamation, restoration, re-habilitation of abandoned quarries in the State by collecting contributions from the minor mineral lessees, in addition to the seigniorage fee making suitable amendments to the TNMMCR, 1959.

Features and Highlights of the system

- Twenty-three agencies have been empanelled for The rate of contribution to the green fund is 10% of seigniorage fee for utilizing the mineral within the state and 50% of seigniorage fee for transportation the minerals the state.
- A committee has been constituted in every districts under the chairmanship of the District Collector concerned along with ex-officio members from various line Departments namely Mines, Forest, WRD, TNPCB, Disaster Management, District Fire Officer for taking up projects for utilizing the fund.

Outcomes

- An amount of Rs.150.48 Cr collected towards Green fund and the implementation of the projects are initiated in the Districts.
- 377 abandoned quarries have been identified for reclamation/ restoration/ re-habilitation. Out of which 66 quarries have been handed over to Local bodies/TWAD for augmenting water resources for drinking water & irrigation purposes.
- In Kancheepuram and Chengalpattu Districts feasibility studies are going on in 56 abandoned quarries for re-adoptive use through outsourced agency.

Summary of Initiatives & Recommendations - Tamil Nadu (1/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Tamil Nadu						

 No initiatives adopted
 *0-25% initiatives adopted*
 *25-50% initiatives adopted*
 *50-75% initiatives adopted*
 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1	M- Sand Policy	▪ The single-window portal and centralised monitoring system will make it easier for quarry owners to obtain licences and clearances, while also ensuring that the quality of M-sand meets the prescribed standards. ▪ The new policy is expected to bring more regulation and transparency to the M-sand industry ▪ It is expected to improve the quality of M-sand with greater compressive strength adhering to BIS prescribed standard ▪ Promotes zero waste mining/quarrying in the state
2	Mining Tenement system	▪ Monitoring via satellite imagery will help the district administration keep a close watch on the boundaries of mineral bearing areas and ▪ During the FY 23-24 till November, 2023, a total of 427 Nos. of registration for different business domains has been carried out in the portal ▪ Up to October, 2023, 8086 Miners, 5437 End Users, 10392 Traders, 2937 Stockiest, 1610 Exporters have registered online
3	DGPS and Drone Survey Technology	▪ DGPS surveys have been completed in 1,132 mines/quarries. ▪ In the first phase, drone surveys have been completed in 200 quarries, and the reports are under scrutiny by Tamil Nadu Unmanned Aerial Vehicle Corporation
4	Mineral Management system	▪ The Govemment have accorded sanction for an amount of Rs. 3.78 crore for issuing e-permits with security feature for transporting minerals. ▪ TNeGAhas developed 16 mineral concession modules which facilitates online receipt quarry lease applications, tracking of lease applications, scrutinizing and granting of lease applications.
5	Green Fund for reclamation, restoration, re-habilitation of AbandonedQuarries	▪ An amount of Rs.150.48 Cr collected towards Green fund and the implementation of the projects are initiated in the Districts. ▪ 377 abandoned quarries have been identified for reclamation/ restoration/ re-habilitation. Out of which 66 quarries have been handed over to Local bodies/TWAD for augmenting water resources for drinking water & irrigation purposes.

Recommendation

Mineral Administration and Mineral Concession	Other states such as Gujarat, MP and Rajasthan have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	States such as Gujarat, MP, Odisha and Rajasthan have been actively pursuing initiatives such as ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation

Summary of Initiatives & Recommendations - Tamil Nadu (2/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Tamil Nadu						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Technology, research and development

Other states have adopted other initiatives:

- Mine Surveillance system
- E-Check gate implementation
- Sand Mine Portal
- These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.

Social project implementation

Other states have adopted other initiatives:

- DMF Portal
- Mines and Mineral Restoration and Rehabilitation Fund
- Upgradation of Healthcare services
- These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Mine closure, waste management , reclamation and rehabilitation

Other states have adopted the initiatives:

- Management of Abandoned mines
- Dumping of Overburden and waste outside the lease area for Minor minerals
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Skilling and Capacity Building

Other states have adopted the initiatives:

- Human Resource Development
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

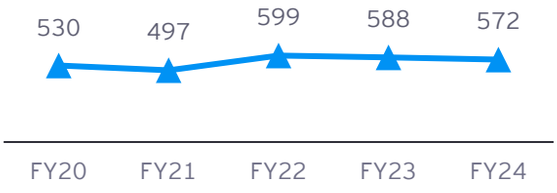
For more information, visit the following website: https://tnmines.tn.gov.in/index.php

5.4 State-wise initiatives and outcomes

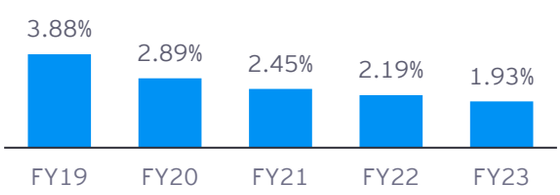
21. Telangana

KPIs so far....

Value of mineral production, INR Cr



Mining contribution (%) to State GDP



Telangana Mineral Scenario

- Telangana, located in the southern region of India, is a mineral-rich state with vast geological diversity that supports a thriving mining and mineral-based industrial sector. The state has a well-established reputation as one of India's significant contributors to mineral production, owing to its rich deposits of coal, limestone, granite, and other economically important minerals.
- Telangana's geological formations, ranging from the ancient Archean rocks to younger sedimentary basins, provide a strong foundation for the exploration and extraction of these resources.
- As per National Mineral Inventory as on 01.04.2020, Telangana accounts for 46% kyanite and 8% limestone resources of the country. Important minerals occurring in Telangana are corundum in Khammam district; garnet in Khammam district; iron ore (hematite) in Karimnagar and Khammam district; iron ore (magnetite) in Adilabad, Mahabubnagar and Warangal districts; limestone in Adilabad, Hyderabad, Karimnagar, Mahabubnagar, Nalgonda, Rangareddy, districts; manganese ore in Adilabad district; Other minerals that occur in the State are chromite, copper, graphite and kyanite in Khammam district.

What's going on so far...

- The principal minerals produced in the state are Limestone, Minor Mineral and Manganese Ore. In 2023-24, Telangana produced 26.79 million tonnes of limestone, contributing 6% to India's total, with a 1% decline from the previous year. The value of this production was ₹5728 crore, representing 5% of the national total.
- Manganese ore production was significantly lower at 6,055 tonnes, a 44% drop, with negligible contribution towards country's total. Its value stood at ₹40 lakh, a 51% decline from the previous year

Best Practices adopted by Telangana

Thematic area - Mineral administration

1 Development of Mineral Resources and Technology Upgradation Fund (DMRTUF)

The Development of Mineral Resources and Technology Upgradation Fund (DMRTUF) is a financial initiative established by the government of India to promote the growth and development of the mineral industry in the country. The primary aim of this fund is to support technological advancements and provide financial assistance for the exploration, extraction, and processing of minerals.

Highlights:

- Mineral Wealth in the State has formulated a Fund for development of mineral resources and also to upgrade the latest techniques and trends in the mining sector.
- State is first in the country to create 'Development of Mineral Resources and Technology Up-gradation Fund (DMRTUF)' by allocating a marginal 10% of sales turnover from the Telangana State Mineral Development Corporation.
- State Government constituted an autonomous Trust for functioning of the DMRTUF.

Outcomes (As of Nov'24)

- mining areas, which directly contributes to economic growth by creating jobs and improving local economies. Enhanced infrastructure also supports better access to resources and markets
- DMRTUF facilitates comprehensive resource audits, which involve the collection of geological, geophysical, and geochemical data. This helps in assessing the mineral wealth of the state effectively and aids in informed decision-making regarding resource allocation and management

Source: State Ministry information received and secondary research

2 Telangana Sand Mining Policy

The Telangana Sand Mining Policy was introduced by the Government of Telangana to regulate and manage sand extraction activities in the state. The policy aims to ensure sustainable sand mining practices, prevent illegal mining, and make sand available at reasonable prices for construction purposes.

Features and Highlights of the system:

- The Sand available from Rivers and streams is categorized into I to V order depending on size and capacity. In I-order streams, the source is small village stream or vagu while V-order would be large rivers like Krishna and the Godavari.
- The Government shall fix the rates and revise the rates of Siegniorage Fee as per the situation/demand warrants.
- Government Departments shall be mandated to use at least 50% of Rock Sand in Government constructions.

Outcomes

- The policy ensures that adequate quantities of quality sand are available at reasonable prices to consumers. This is particularly beneficial for construction industries that rely on consistent and high-quality sand supplies.
- The policy establishes a structured framework for sand mining, reducing illegal extraction and ensuring that mining activities comply with environmental regulations. This regulation helps maintain ecological balance and prevents resource depletion.

Thematic Area: Technology, research and development

3 TS-e Mining Mobile Application:

TS-eMining App was officially launched on 30-09-2023. The mobile app facilitates inspection of minerals during transportation by vehicles. TS-eMining Mobile App is robust and dynamic in nature, being enriched continuously with new functionalities that empowered by latest technology and standard practices

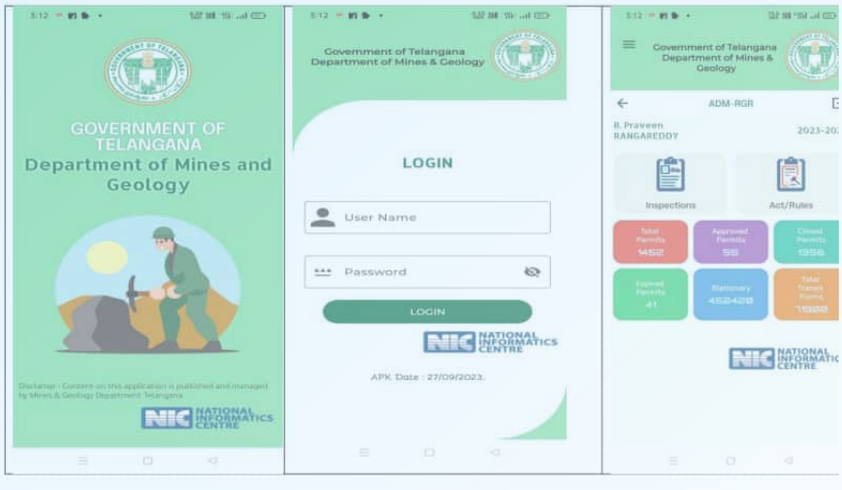
Features and Highlights of the system:

- TS-eMining Mobile App serves the field officers at District level to verify the validity of the transit forms/passes, sand way bills, Brick Transportation etc., issued by the department
- In case of unauthorized mineral transportation detection, the Mobile App facilitates auto calculation of statutory payments based on the quantity, type and variety of mineral the Payment Link is sent through SMS to the owner of the vehicle to pay penalty online.

Outcomes

- It provides online payment facility for the penalty imposed due to non-availability of passes or excess quantity that being transported.
- Owners/ defaulters are be communicated through SMS and avoid manual handling of cash by the officers in the field
- Online Receipts and Reports shall be viewed and verified by the concerned authorities

Mobile APP Screen Shots



Summary of Initiatives & Recommendations - Telangana (1/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Telangana						

 No initiatives adopted
 *0-25% initiatives adopted*
 *25-50% initiatives adopted*
 *50-75% initiatives adopted*
 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1	Development of Mineral Resources and Technology Upgradation Fund (DMRTUF)	▪ DMRTUF promotes infrastructure development in mining areas, which directly contributes to economic growth by creating jobs and improving local economies. Enhanced infrastructure also supports better access to resources and markets ▪ DMRTUF facilitates comprehensive resource audits, which involve the collection of geological, geophysical, and geochemical data. This helps in assessing the mineral wealth of the state effectively and aids in informed decision-making regarding resource allocation and management
2	Telangana Sand Mining Policy	▪ The policy ensures that adequate quantities of quality sand are available at reasonable prices to consumers. This is particularly beneficial for construction industries that rely on consistent and high-quality sand supplies. ▪ The policy establishes a structured framework for sand mining, reducing illegal extraction and ensuring that mining activities comply with environmental regulations. This regulation helps maintain ecological balance and prevents resource depletion.
3	TS-e Mining Mobile Application	▪ It provides online payment facility for the penalty imposed due to non-availability of passes or excess quantity that being transported. ▪ Owners/ defaulters are be communicated through SMS and avoid manual handling of cash by the officers in the field ▪ Online Receipts and Reports shall be viewed and verified by the concerned authorities

Recommendation

Mineral Administration and Mineral Concession	Other states such as Gujarat, MP and Rajasthan have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	States such as Gujarat, MP, Odisha and Rajasthan have been actively pursuing initiatives: ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Sustainable Mining Practices	States such as Chhattisgarh and Rajasthan have adopted other initiatives: ▪ M-Sand Policy ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development

Summary of Initiatives & Recommendations - Telangana (2/2)

Initiative Overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Telangana						

No initiatives adopted | *0-25% initiatives adopted* | *25-50% initiatives adopted* | *50-75% initiatives adopted* | *>75% initiatives adopted*

Recommendation

Technology, research and development

Other states have adopted other initiatives:

- Mine Surveillance system
- Drone Survey of Quarries
- E-Check gate implementation
- These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.

Social project implementation

Other states have adopted other initiatives:

- DMF Portal
- Upgradation of Healthcare services
- District Mineral Foundation
- These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Mine closure, waste management , reclamation and rehabilitation

Other states have adopted the initiatives:

- Management of Abandoned mines
- Dumping of Overburden and waste outside the lease area for Minor minerals
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Skilling and Capacity Building

Other states have adopted the initiatives:

- Human Resource Development
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

For more information, visit the following website: https://mines.telangana.gov.in/

5.4 State-wise initiatives and outcomes

22. Uttar Pradesh

Uttar Pradesh Mineral Scenario

- Uttar Pradesh (UP), one of India's largest and most populous states, is known for its agricultural strength, cultural significance, and historical landmarks. While the state is not as mineral-rich as some other parts of India, it holds substantial mineral resources that are crucial for its economic growth, particularly in sectors like construction, infrastructure development, and manufacturing.
- The state's mineral wealth is primarily concentrated in non-metallic minerals, which play an essential role in key industries such as cement, construction, ceramics, and brick production.
- The state's mineral reserves, though not as diverse or extensive as those in other mineral-rich states, still contribute significantly to India's overall mineral production. Limestone, sand, clay, building stones, and other industrial minerals found in Uttar Pradesh support the construction sector, which is crucial to the state's infrastructure development.
- Additionally, Uttar Pradesh has significant reserves of minerals such as mica and bentonite, which are essential for specific industries like electronics and cosmetics.
- Given Uttar Pradesh's large population and rapid urbanization, there is an increasing demand for building materials, infrastructure, and housing, all of which are heavily dependent on the state's mineral resource
- The mining sector in the state plays a pivotal role in fulfilling these needs. Although the state's mining industry is mainly focused on non-metallic minerals, it is still crucial to the local economy and provides employment to thousands of people, especially in rural areas where mining and mineral processing are key sources of livelihood.

What's going on so far...

- Despite its economic importance, Uttar Pradesh's mining sector faces several challenges. Issues like illegal mining, environmental degradation, and unregulated mining practices have hindered the sustainable growth of the industry.
- To address these challenges, the state has been working towards improving its mining regulations, promoting sustainable practices, and ensuring better enforcement of laws to prevent illegal mining activities.
- The government's efforts to modernize the sector and focus on responsible mining practices are crucial for maximizing the benefits of Uttar Pradesh's mineral resources while minimizing their environmental impact

Best Practices adopted by Uttar Pradesh

1.Thematic area: Mineral Administration

1 MineMitra

MineMitra is an online platform developed by the Directorate of Geology & Mining, Government of Uttar Pradesh. It aims to streamline and digitize various mining-related services for citizens, businesses, and government officials. It has four components 1. Mining e-services for Citizens and Concessionaire, 2. Online Mineral Management for DGM, Lessee, Stockist and transporter, 3. Smart Enforcement system and 4. e-commerce portal

Highlights:

- An integrated IT Solution to curb illegal mining practices through real-time data surveillance & creating a standardized legal regime applicable uniformly to all concessionaires operating across the state.
- Created a complete tech-driven ecosystem that includes geo-fencing of lease areas, PTZ cameras and weighbridges in mines

Outcomes (As of Nov'24)

- Over 1,256 lease areas have been geo-fenced, which is a location-based service that creates a virtual boundary
- More than 800 weighbridges – the platforms used to determine the weight of large vehicles and containers – are installed. The weighbridges are connected to the Vahan portal to know the permissible weight for the vehicles.

Source: State Ministry information received and secondary research

2 Online E-permit systems

The Online E-Permit system in Uttar Pradesh, available through the MineMitra platform, has streamlined the process of obtaining permits for mining activities. The system allows for easy application and issuance of permits for mining, transportation and storage of minerals, thus reducing time and efforts. These efforts have led to a more efficient, transparent and sustainable mining sector in the state.

Highlights:

- Ease of Access: Users can apply for various permits online, including those for mining, transportation, and storage of minerals
- Transparency and Efficiency: The system ensures that all applications are processed transparently and efficiently, reducing delays and enhancing compliance

Outcomes

- MineMitra has issued over 1.5 million e-permits for mining activities in Uttar Pradesh

Thematic area: Sustainable Mining Practices

3 M-Sand policy

M-Sand policy aims to achieve sustainable development without harming the environment and ecosystem of the rivers In view of the limited quantity of sand available in the riverbed and its increasing demand, M-Sand is being promoted as an alternative to river sand

Highlights:

- Environmental Protection: The policy promotes the use of M-sand to protect river ecosystems and reduce the dependency on riverbed sand
- Simplified Licensing: The process for issuing licenses for M-sand production has been streamlined to make it more accessible for entrepreneurs.
- Monitoring and Enforcement: The policy includes measures for real-time monitoring of mineral transportation to prevent illegal activities
- the policy aims to create new employment opportunities and contribute to the state's economic growth.

Outcomes

- The establishment of M-sand will boost the local economy and contribute to Uttar Pradesh's goal of becoming a one-trillion-dollar economy
- encourage the production of manufactured sand i.e. artificial sand, as an alternative to the sand found in the river-bed

Thematic area: Technology, research and development

4 Vehicle tracking management system

Vehicle tracking management system in Uttarakhand uses GPS and RFID technology to track the movement of vehicles involved in mineral transportation. This system provides real-time data on vehicle locations and operations, helping to ensure that all transportation activities are legal and properly documented

Highlights:

- E-Abhivahan Permit: The system ensures that an e-Abhivahan permit, required for mineral transportation, is issued only when the vehicle is present in the geo-fenced mining area.
- The implementation of Vehicle tracking management system has significantly reduced illegal mining activities by ensuring strict monitoring and compliance, system has improved the efficiency of mineral transportation, reducing delays and ensuring timely deliveries, use of technology has increased transparency in the mining sector, making it easier to track and manage mineral resources,through this system supports the state's economic activities and revenue generation

Outcomes

- Vehicles used for mineral transportation are equipped with RFID tags, which are read at various checkpoints to monitor their movement.
- Satellite monitoring and Remote sensing technology is used to oversee areas prone to illegal mining.

5 Drone Survey for Quarries and Sand Mines

Drone use in Uttar Pradesh's mining sector involves aerial surveys and mapping of quarries and sand mines. This technology provides high-resolution images and data, which are used to create detailed topographical maps and digital terrain models (DTMs) of mining areas

Highlights:

- The department will use orthomosaic images to estimate what lies up to 3 cm beneath the surface. department will create base data of the existing mineral rich soil through drone surveys to generate a photogrammetrically orthorectified image which will be matched with the new image

Outcomes

- The mining department will to use drones for exploration, survey and surveillance of the river basins to meet the increasing demand for minor minerals and generate higher revenue.The department Is using orthomosaic images to estimate what lies up to 3 cm beneath the surface

Summary of Initiatives & Recommendations - Uttar Pradesh (1/2)

Initiatives overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management, reclamation and rehabilitation
Uttar Pradesh						

 No initiatives adopted
 *0-25% initiatives adopted*
 *25-50% initiatives adopted*
 *50-75% initiatives adopted*
 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative
1	Minemitra	▪ Over 1,256 lease areas have been geo-fenced, which is a location-based service that creates a virtual boundary ▪ Over 800 weighbridges are installed and linked to the Vahan portal to track permissible vehicle weights.
2	Online E-permit system	▪ MineMitra has issued over 1.5 million e-permits for mining activities in Uttar Pradesh
3	M-Sand policy	▪ The establishment of M-sand will stimulate the local economy and contribute to Uttar Pradesh's goal of becoming a one-trillion-dollar economy ▪ Encourage the production of manufactured sand i.e. artificial sand, as an alternative to the sand found in the riverbed
4	Vehicle tracking management system	▪ Vehicles used for mineral transportation are equipped with RFID tags, which are read at various checkpoints to monitor their movement. ▪ Satellite monitoring and Remote sensing technology is used to oversee areas prone to illegal mining.
5	Drone Survey for Quarries and Sand Mines	▪ The mining department will use drones for exploration, survey, and surveillance of river basins to meet growing demand for minor minerals and boost revenue, while using orthomosaic images to estimate subsurface details up to 3 cm.

Recommendation

Mineral Administration and Mineral Concession	▪ Other states have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	▪ Other states have been actively pursuing initiatives: ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Sustainable Mining Practices	▪ Other states have adopted other initiatives: ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development

Summary of Initiatives & Recommendations - Uttar Pradesh (2/2)

Initiatives overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Uttar Pradesh						

 No initiatives adopted

 *0-25% initiatives adopted*

 *25-50% initiatives adopted*

 *50-75% initiatives adopted*

 *>75% initiatives adopted*

Recommendation

Technology, research and development

Other states have adopted other initiatives:

- Mine Surveillance system
- Drone Survey of Quarries
- E-Check gate implementation
- Sand Mine Portal
- These initiatives have helped the states to significantly reduce illegal mining activities, increase revenue and improve environmental compliance.

Social project implementation

Other states have adopted other initiatives:

- DMF Portal
- Mines and Mineral Restoration and Rehabilitation Fund
- Upgradation of Healthcare services
- These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Mine closure, waste management , reclamation and rehabilitation

Other states have adopted the initiatives:

- Management of Abandoned mines
- Dumping of Overburden and waste outside the lease area for Minor minerals
- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Skilling and Capacity Building

Other states have adopted the initiatives:

- Human Resource Development
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

For more information, visit the following website: https://dgmup.gov.in/

5.4 State-wise initiatives and outcomes

23. Uttarakhand

Uttarakhand Mineral Scenario

- Uttarakhand holds significant mineral resources that contribute to its economic development. The unique geographical and geological features of Uttarakhand, shaped by the mighty Himalayas, have endowed it with a variety of mineral deposits. These minerals are crucial for local industries, agriculture, and construction activities, making them integral to the region's socio-economic fabric.
- Though Uttarakhand is not among the top mineral-producing states in India, its deposits of limestone, soapstone, magnesite, and minor minerals like sand and stone are critical for supporting regional development. The state's focus on balancing economic activities with environmental conservation is particularly significant, given its fragile ecosystem.
- Uttarakhand has adopted policies aimed at promoting sustainable mining practices and ensuring that its mineral wealth is utilized responsibly to support industrial growth while preserving its natural resources. The importance of this approach is amplified by the state's reliance on tourism and agriculture, sectors that depend heavily on ecological health

What's going on so far...

- Uttarakhand has implemented sustainable mining practices to protect the environment and manage resources effectively. A key initiative is a comprehensive plan for riverbed mining near sensitive areas like the Rajaji Tiger Reserve, ensuring wildlife protection. Regular Environmental Impact Assessments (EIAs) monitor the impact on communities and ecosystems, guiding informed decisions.
- Advanced technology, such as drone surveys and the Vehicle Tracking Management System (VTMS), enhances planning, monitoring, and compliance, reducing illegal mining activities. Drones provide high-resolution imagery, while VTMS tracks mineral transportation using GPS and RFID.
- Mining companies also engage with local communities, offering employment and supporting development. Rehabilitation efforts, like tree planting and habitat restoration, help minimize environmental impacts and promote responsible resource use, benefiting both the ecosystem and the local economy.

Best Practices adopted by Uttarakhand

Thematic areas - Mineral administration

1 Mining lease Monitoring system (E-Rawanna/E-Transit pass)

The Mining Lease Monitoring System by the state of Uttarakhand is a digital platform aimed at improving transparency, accountability, and efficiency in managing mining leases and related activities. The system includes the issuance of e-Transit passes for the transportation of minerals, which are mandatory for all vehicles transporting minerals within and outside the state

Highlights:

- The e-permit system is integrated with a payment gateway, allowing for the online payment of royalties, application fees, and other charges
- Mandatory Vehicle and Transporter Registration for Vehicle involved in mining activities.

Outcomes:

- Number of E-permits generated/Dispatched permit & Transit pass issued:
- Form MM11: 1,65,11,817
- Form J: 1,48,36,916
- Form K: 30,919
- Form N: 3,705
- Revenue generated through the system is Rs. 1819,82,74,839
- Reduction in Illegal Mining and Illegal Mineral Transportation.
- Increased Transparency
- Revenue Increase

Source: State Ministry information received and secondary research

Thematic Area: Technology, research and development

2 Vehicle tracking management system:

The system allows for real-time tracking and monitoring of mineral transportation, helping to prevent illegal mining activities

Highlights:

- A vehicle tracking system in mining is critical for optimizing operations, ensuring safety, and improving overall productivity.
- By monitoring speed and unauthorized vehicle access, these systems enhance safety, prevent accidents, and ensure compliance with regulatory and operational guidelines in the mining sector.

Outcomes

- It has significantly reduced illegal activities, increased state revenue, and ensured compliance with environmental and safety standards.
- By addressing challenges and expanding its scope, the VTS can continue to play a pivotal role in sustainable development and efficient resource management in the state.

3 Mines surveillance system:

The Uttarakhand government approved a Rs 93-crore proposal for the installation of Mining Digital Transformation and Surveillance System (MDTSS), across the state to curb illegal mining. This initiative aims to achieve a digital transformation of current mining processes including survey, digitization monitoring and surveillance of existing & new mining lease area, Stone crusher, Screening plant area and mineral stock permit area of Uttarakhand

Key Features and Highlights

- The systems will be installed at 40 check gates across Dehradun, Haridwar, Nainital, and Udham Singh Nagar.
- The new system equipped with bullet cameras, Radio Frequency Identification (RFID) radars, and Light Emitting Diodes (LED) floodlights will not only help monitor illegal mining activities but also boost the state government's revenue.
- A Mining State Control Centre (MSCC) will be set up in Dehradun, along with mini command centres at district headquarters in Dehradun, Haridwar, Nainital, and Udham Singh Nagar.

Outcomes

- Resulted in proper documentation and regulated mining activities resulting in boost in state's mining revenue operations
- Reduced environmental impact of mining activities due to monitored activites and efficient compliances

Summary of Initiatives & Recommendations - Uttarakhand (1/2)

Initiatives overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Uttarakhand						

 No initiatives adopted
 *0-25% initiatives adopted*
 *25-50% initiatives adopted*
 *50-75% initiatives adopted*
 *>75% initiatives adopted*

S.No.	Initiative adopted	Impact from adoption of Initiative

1	Mining lease Monitoring system (E-Rawanna/E-Transit pass)	▪ Number of E-permits generated/Dispatched permit & Transit pass issued:
		  ▪ Form MM11: 1,65,11,817
		  ▪ Form J: 1,48,36,916
		  ▪ Form K: 30,919
		  ▪ Form N: 3,705
		▪ Revenue generated through the system is Rs. 1819,82,74,839
		▪ Reduction in Illegal Mining and Illegal Mineral Transportation.
		▪ Increased Transparency
		▪ Revenue Increase

2	Online E-permit system	▪ It has significantly reduced illegal activities, increased state revenue, and ensured compliance with environmental and safety standards. ▪ By addressing challenges and expanding its scope, the VTS can continue to play a pivotal role in sustainable development and efficient resource management in the state.
3	M-Sand policy	▪ Resulted in proper documentation and regulated mining activities resulting in boost in state's mining revenue operations ▪ Reduced environmental impact of mining activities due to monitored activities and efficient compliances

Recommendation

Mineral Administration and Mineral Concession	Other states have adopted other initiatives: ▪ Pre-embedded clearances for auction and ▪ Post auction facilitation establishment ▪ Facilitating Compensatory Afforestation ▪ These initiatives have helped the states reduce time for renewal of mandatory clearances and post-auction mechanism leading to early operationalization of mines
Exploration and Mines development	Other states have been actively pursuing initiatives: ▪ Digitization, Segregation and Categorization of Past Exploration data/ reports ▪ Strategic Collaboration for Mineral Resource Mapping ▪ Establishment of State Mineral exploration trust ▪ Collaborations with PSUs for exploration projects Which is expected to boost their mining and exploration activities thus improving mineral production and revenue generation
Sustainable Mining Practices	Other states have adopted other initiatives: ▪ M-Sand Policy ▪ Star Rating of Minor Minerals ▪ Which aims to promote sustainable mining practices, simplify regulations and quality standards while maintaining environmental protection and fostering economic development

Summary of Initiatives & Recommendations - Uttarakhand (2/2)

Initiatives overview

State	Mineral administration and mineral concession	Exploration and mines development	Sustainable mining practices	Technology, research and development	Social project implementation	Mine closure, waste management , reclamation and rehabilitation
Uttarakhand						

 No initiatives adopted

 *0-25% initiatives adopted*

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 *50-75% initiatives adopted*

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Recommendation

Technology, research and development

Other states have adopted other initiatives:

- Mine Surveillance system
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Social project implementation

Other states have adopted other initiatives:

- DMF Portal
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- Upgradation of Healthcare services
- These initiatives have helped the states to improve the livelihoods of local populations, promote sustainable development, and ensure that mining activities contribute to social welfare .

Mine closure, waste management , reclamation and rehabilitation

Other states have adopted the initiatives:

- Management of Abandoned mines
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- These initiatives implemented by Kerala showcases the commitment of the state to responsible mining and long-term ecological balance. These efforts not only mitigate the adverse impacts of mining but also create opportunities for ecological restoration, economic development, and community upliftment.

Skilling and Capacity Building

Other states have adopted the initiatives:

- Human Resource Development
- This initiative has significantly enhanced the government's efficiency by equipping employees with advanced skills and knowledge, leading to improved public service delivery. Additionally, it has fostered a more competent and motivated workforce, driving innovation and better governance.

For more information, visit the following website: https://dgm.uk.gov.in/

5.4 State-wise initiatives and outcomes

Overview of the Initiatives of the States that have not provided information on the best practices adopted. Following information is through Secondary research

1. Arunachal Pradesh

- Issue of Transit Challan as per the Rule 58 under APMMC Rule,2020 after approval of competent authority
- Verification of documents of all vehicles carrying minor minerals like sand, boulders and gravels etc in terms of royalty payments

2. Manipur

- The Manipur Mineral Policy,2021 states that efforts shall be made by the Government to establish a Mining Tenement system which would primarily involve automating the entire concession life-cycle using the state-of-the-art IT systems
- Constituted the task force to review the action taken by member departments for checking the illegal mining activities in their respective jurisdiction.

3. Sikkim

- The Online Land Stability Reporting System (OLRS) developed by Sikkim in India is a specialized initiative aimed at addressing and managing land stability concerns in the context of mining and other land-impacting activities

4. Tripura

- In order to maintain the ecological sustainability of river-beds: and the flow in a particular river during rainy season and to prevent damage to the adjoining agricultural field/land during rainy season due to heavy rain, the Divisional Forest Officers may specifically grant permit to valid Forest Transit license holder to remove the sand /silt from the· river-beds in the earmarked portion of the river,

5. West Bengal

- Skill Development in Mining for Entry Level of Operator : West Bengal Mineral Development & Trading Corporation Limited is setting up an ITI level mining institute near Rupnarayanpur (District- West Burdwan) to meet the skill gap in the minerals & mining sector of the state
- Sand Supply chain Management system: WBMDTCL introduced a Sand Supply Chain Management System, an ICT driven process reengineering initiative for end-to-end tracking of sand mining and its intra and inter-state movement through a robust mechanism for digitization of sand mining blocks, lessee and vehicle registration, e-collection of royalty and fees, e-issuance of excavation permits and road-challans.

6. Nagaland

- Mineral Exploration is one of the main activities of the department since its establishment where various minerals are discovered and investigated. The important minerals of the state for which the department has been carrying out exploration activities for resource and reserve estimation are Coal, Nickel-cobalt-chromium bearing Magnetite, Limestone, Building Materials including dimension/decorative stones, clay, etc., Platinum Group of Element (PGE) and Gold (Au), Other base metals, noble metals, chromites
- The exploration of Petroleum and Natural Gas in Nagaland had been carried out by Oil and Natural Gas Corporation (ONGC) Ltd. Subsequently, ONGC undertook exploitation activities at Changpang Oilfield for a decade from 1981 to 1994; however, operation had been suspended since then. Later, another private Canadian company Canaro had also carried out some seismic survey work. The Petroleum &Natural Gas Board, Nagaland administers the overall activities related to P & NG in the state where the department gives logistic support and monitors the exploration and exploitation activities of P&NG in the state for the welfare of the public.

For more information, visit the following website:

Department of Geology and Mining | District Anjaw, Government of Arunachal Pradesh | India – Arunachal Pradesh

Mineral Based Product - Manipur

Government of Sikkim, India - Sikkim

trpenvis.nic.in - Tripura

Directorate of Mines and Minerals - Commerce and Industries Department - West Bengal – West Bengal

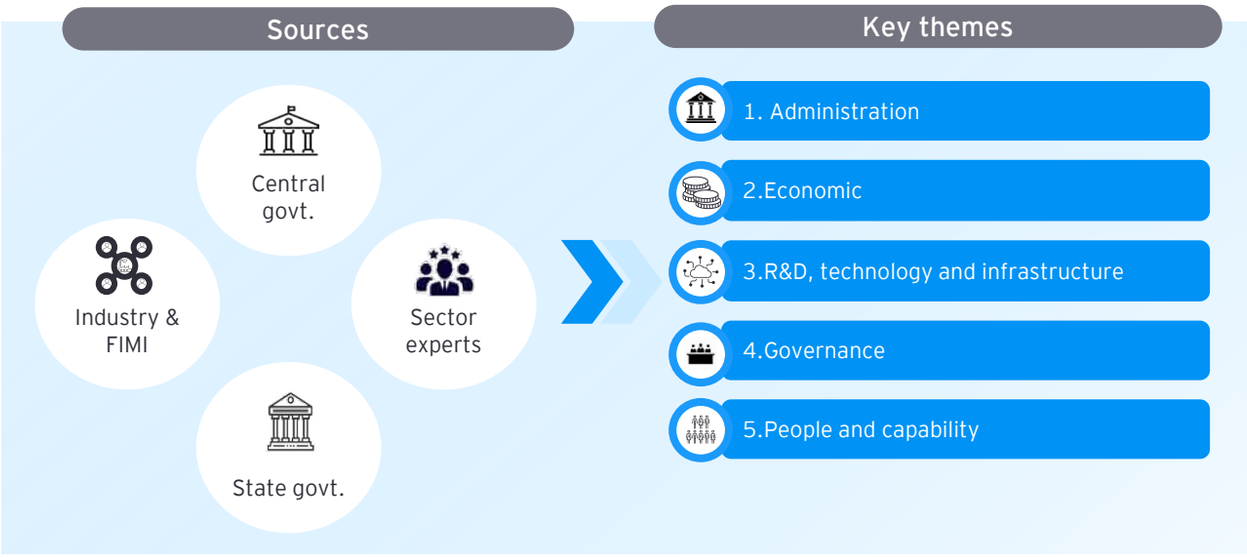
Geology & Mining: Nagaland | - Nagaland

06

Way forward

6.1 Way forward

Recommendations: Sources and key themes



Recommendations for the Central and State governments

	1.Administration	2.Economics	3.R&D, technology and infrastructure	4.Governance	5.People and capability
Central Govt.	1.a.Empower juniors for exploration with composite licences 1.b.Different regulatory regime for grant and development of critical and strategic mineral blocks 1.c.Clearances based on area for ease of transfer of ownership 1.d.No forest clearance for survey and Prospecting/Exploration 1.e. Unified policy for sustainable and responsible mining	2.a.Royalty and tax rationalization with ETR (Effective Tax Rate) of 40% capping 2.b.Export promotion council for dimension stones 2.c. 80%-85% NMET, GSI, MECL budget allocated to deep seated and critical minerals	3.a. National digital platforms to drive tech advancement 3.b. Foster R&D on Green Mining Practices 3.c. GSI support for minor mineral exploration in select states 3.d. Strategic overseas acquisitions for critical minerals	4.a. Single window clearance for statutory clearances 4.b. Standard reporting framework for exploration (JORC, etc.) 4.c. Enhanced safety standards for workforce 4.d. Enhanced environmental and social standards	5.a. Foundation education viz. degrees at IITs, NITs 5.b. Expand vocational training programmes 5.c. Skilling of mining workforce under Skill Council for Mining Sector (SCMS)
Common	1.f. Integration of CTE and CTO consents with EC	2.d. Revamp concession structure (utilization of low-grade mines, forward integration plans, etc.)	3.e. Dedicated logistics corridors for mineral movement	4.e. Set up PMUs for operationalization of auctioned blocks	
State Govt.	1.g. Fast-tracking pre-embedded clearances 1.h. Time-bound approval mechanism and deemed approvals 1.i. Set up of state mineral exploration trusts 1.j. Land banks to facilitate compensatory afforestation 1.k. Minor Minerals lease extension to 50 years 1.l. Cluster-based clearances and approvals for small mines	2.e. Minor minerals tax rationalization 2.f. Standardization of pricing structure for land acquisition	3.f. Exploration data integration with NGDR 3.g. Adoption of MSS and MTS for minor minerals	4.f. Star ratings for minor minerals 4.g. Utilization of wastes and abandoned mine mgmt. 4.h. Empowering district mining offices for governance 4.i. DMF monitoring extended to KPIs for outcomes	5.d. Strengthen state DMGs for technical capacity building

Recommendations for the central government (1/2)

1. Administration

- **1.a. Empower juniors for exploration and roll out composite licenses:** Increase the exploration spend in the country to tap into unexplored resources by:
  (i) empowering juniors to take up exploration through availability of financing
  (ii) rolling out composite licenses for exploration with the first right to refuse for mining
- **1.b. Different regulatory regime for grant and development of critical and strategic mineral blocks:** Mining rights be given to Exploration License holder and Single Window Clearance approach be adopted for acquiring statutory clearances and land acquisition for developing such blocks .
- **1.c. Clearances based on area for ease of transfer of ownership:** The rules and regulations around ownership and transfer rights need to be revised to make India an attractive destination for mining. The clearances should be given for the area and not for the owner. In cases where mineral production is no longer economical, lessee should be allowed to surrender the license.
- **1.d. No forest clearance for survey and prospecting/exploration:** Survey and prospecting / exploration should not be considered as 'Non-Forest activity' –and hence FC should not be applicable.
- **1.e. Unified policy for sustainable and responsible mining for major minerals:** Outline measures to simplify and harmonize mining regulations across states while adhering to sustainability goals. Introduce streamlined procedures to reduce administrative bottlenecks and improve ease of doing business in the mining sector. Strengthen mechanisms to track compliance with sustainability guidelines and environmental standards across all mining operations.
- **1.f. Integration of CTE and CTO consents with EC** : once EC is issued, the process of acquiring CTE and CTO be dispensed with.

2. Economics

- **2.a. Royalty and tax rationalization with ETR(Effective Tax Rate) of 40% capping:** Revisit the tax rates to make them at par with global mining economies(comparative chart enclosed- Annex-2): To increase attractiveness for mining in India. Possible interventions include:
  - implementing a unified tax rate (like GST) for the mining industry capped at 40%
  - subsuming DMF (District Mineral Foundation) and NMET (National Mineral Exploration Trust) in royalty
  - benchmark royalty on key minerals with other countries
- **2.b. Export promotion council for dimension stones and industrial minerals:** Setting up of Standalone Export Promotion Council (ECP) for promoting the exports of minerals with focus on dimension stones and industrial minerals. A Standalone Export Promotion Council (EPC) dedicated specifically to the mineral sector, with a focus on dimension stones and industrial minerals, would be an important step toward boosting the country's position in the global mining market.
- **2.c. 80% to 85% NMET, GSI, MECL budget allocated to deep-seated and critical minerals:** Enhanced budget on exploration of deep-seated and critical minerals.–80% to 85% of the total budget of NMET, GSI, MECL be earmarked for exploration of deep-seated, critical and strategic minerals where the country has full/major reliance on their imports.
- **2.d. Revamp concession structure (utilization of low-grade mines, forward integration plans, etc.):** Revamp the structure for security of concessions:
  - A system of renewal of mineral concession could be reintroduced in the interest of mineral conservation and maximization of utilization of lower grades available in the mineral deposits,
  - The evaluation of bids should be done based on the production capability of the player and not just on the percentage revenue share promised by the bidder.

3. R&D, Technology and infrastructure

- **3.a. National digital platforms to drive tech advancement:**
  - Expand the National Mining Tenement System (NMTS) for end-to-end digital tracking of leases, production and environmental compliance.
  - Leverage cutting-edge technologies like GIS mapping, artificial intelligence, and IoT for mineral exploration, compliance and waste management
- **3.b. Foster R&D on green mining practices:**
  - Allocate dedicated national funds to support research on cutting-edge green mining technologies such as zero-waste mining, sustainable blasting techniques, and renewable energy integration.
  - Establish partnerships with global mining leaders and research institutions to bring best practices and technologies to India.
  - Encourage innovation through public funding for pilot projects in waste recycling, reclamation, and energy efficiency.
- **3.c. GSI support for minor mineral exploration in select state:** In some select sates GSI to support the states in mineral exploration.
- **3.d. Strategic overseas acquisitions for critical minerals**: With the expected increase in demand for energy critical, deep-seated and technology rare minerals such as Lithium and Cobalt, there is a need to shift focus to explore and mine these minerals. A key intervention in the short term would be to acquire assets overseas.
- **3.e. Dedicated logistics corridor for mineral movement:** Government initiatives, coupled with private sector involvement, are essential to building a comprehensive logistics framework that will support the long-term growth of the mining industry and contribute significantly to India's economic prosperity.

Recommendations for the central government (2/2)

4. Governance

- **4.a. Single window clearance for statutory clearances: The government may** make single-window clearances mandatory: For grant of EC, FC, WL and Coastal Regulation Zone through PARIVESH portal maintained by the Ministry of Environment, Forest and Climate Change (MoEFCC). MoEFCC should upfront declare inviolate forest areas specifying whether underground or opencast mining can be done in these areas.
- **4.b. Standard reporting framework for exploration (JORC, etc.):** Maintain a strong data repository for better regulation and reporting: A uniform data base of surveys is required which should be made available to all interested parties. The reporting should follow the latest exploration reporting frameworks, like JORC or NI-43, and move away from the traditional UNFC framework. Also, the prevailing GSI norms to be updated in line with the globally accepted standards to enable adequate and efficient exploration and create an amenable ecosystem for the participation of international explorers/miners.
- **4.c. Enhanced safety standards for workforce:** Implement national safety standards, focusing on reducing occupational hazards and ensuring the well-being of workers and local communities.
- **4.d Enhanced environmental and social standards:**
  - Expand the role of CAMPA funds to support afforestation and biodiversity restoration projects in mining-affected regions.
  - Develop mechanisms for independent oversight of corporate social responsibility (CSR) initiatives undertaken by mining companies.
- **4.e. Set up PMUs for operationalization of auctioned blocks:** PMUs to be set up for earlier operationalization of auctioned blocks. PMUs should act as a single point of contact for stakeholders to coordinate with various government departments. They should assist mining companies in obtaining necessary clearances, including environmental, forest, wildlife, and land acquisition approvals. (status of auctioned major mineral blocks enclosed as Annex-1)

5. People and capability

- **5.a. Foundation education viz. degrees at IITs and NITs:** Develop a concerted approach for foundation education in mining by working with MHRD and MSDE. introduce degree programs by ramping up domestic institutes (e.g., IITs, NITs) to train for mining engineers, geologists and geophysicists
- **5.b. Expand vocational training programmes: E**xpand vocational training programmes, e.g., roll out new job roles and increased allocations for skilled and non-skilled labor under SCMS for mining sector
- **5.C.Skilling of mining workforce under Skill Council for Mining Sector (SCMS):** Capacity building and skilling. of mining workforce under the aegis of Skill Council for Mining Sector (SCMS) is vital for the future growth of the Indian mining sector. By equipping the workforce with the necessary skills and knowledge, SCMS plays a crucial role in addressing the skill gaps, ensuring safety, and promoting sustainability in mining operations.

Recommendations for state governments (1/2)

1. Administration

- **1.f. Integration of CTE and CTO consents with EC for minor minerals:** Once EC is issued, the process of acquiring CTE and CTO be dispensed with.
- **1.g. Fast-tracking pre-embedded clearances:**
  - Set up a monitoring authority to oversee the clearance process and ensure timely resolution of pending approvals
  - Form inter-departmental committees for synchronized decision-making involving environment, forest and revenue departments
  - Conduct periodic reviews of clearance processes to identify bottlenecks and implement improvements
  - Define timelines for each stage of the clearance process should be mandated, with strict accountability mechanisms for delays
- **1.h. Time-bound approval mechanism and deemed approvals:** Create time-bound approval mechanisms at each stage, with potential 'deemed approved' provision if pending at a particular stage over a reasonable stipulated time period.
- **1.i. Set up of state mineral exploration trusts:** Establishment of State Mineral Exploration Trust (SMET) in all states for encouraging and promotion of scientific exploration of minor minerals. By empowering states to conduct independent and sustainable exploration activities, SMET not only accelerates mineral discovery but also contributes to revenue growth, industrial development, and economic self-reliance.
- **1.j. Land banks to facilitate compensatory afforestation:** To mitigate the ecological effects of mining, states should establish land banks to support compensatory afforestation. This involves allocating land to lessees for reforestation and implementing sustainable forestry practices.
- **1.k. Minor Minerals lease extension to 50 years:** The validity of all mining leases of minor minerals should be 50 years as applicable for major minerals. Extending the validity period of mining leases for minor minerals to 50 years, in alignment with the practices for major minerals with potential benefits and challenges, should be carefully considered.
- **1.l. Cluster-based clearances and approvals for small mines:** The government should consolidate all small mining lease areas cluster-wise and provide statutory clearances to the lessee. Further, to strengthen the objective of consolidation of mining leases, State Government should utilize Mining Tenement System (MTS) and Mining Surveillance System (MSS) systematically in all mineral concession platforms, thereby adopting complete e-governance.

2. Economics

- **2.d. Revamp concession structure for minor minerals (utilization of low-grade mines, forward integration plans, etc.):** Revamp the structure for security of concessions:
  - A system of renewal of mineral concession could be reintroduced in the interest of mineral conservation and maximization of utilisation of lower grades available in the mineral deposits,
  - The evaluation of bids should be done based on the production capability of the player and not just on the % revenue share promised by the bidder.
- **2.e. Minor Minerals Tax Rationalization:** There are wide variations in the rates of royalty and taxes imposed by the states. Hence, there is a need to have uniform rates of royalty and taxes for a specific minor mineral across the states.
- **2.f. Standardization of pricing structure for land acquisition:** There is a need to improve the land acquisition process for the mining sector. The key reason behind the status quo is the lack of willingness of landowners to relocate and sell their land purely on the basis of prevailing market valuation. In addition to an upfront payment to the land-owner based on market price valuation of land, the mining concessionaire should share a certain percentage of net profit after tax every year in perpetuity for the concession period with the land-owners. This will help in reducing the high upfront burden on the mining player and provide sustained income to the land-owner.

3. R&D, Technology and infrastructure

- **3.e. Dedicated logistics corridor for mineral movement:.** States to chalk out potential key dedicated logistics corridors based on locations of deposits and markets and enable through the PPP (public private partnership) model. This model can also be explored to help with last mile infrastructure for mines, e.g., slurry pipeline, overland conveyor, railway siding, concrete roads, etc.
- **3.f. Exploration data integration with NGDR:** Some states have digitalized the exploration data and other states are in the process of digitalizing their exploration data. States should upload their digitalized exploration data in the NGDR (National Geoscience Data Repository) portal.
- **3.g. Adopt MSS and MTS for minor minerals:** State governments should utilize Mining Tenement System (MTS) and Mining Surveillance System (MSS) systematically in all mineral concession platforms for minor minerals to curb Illegal mining and establish a robust framework for the sustainable management of minor mineral resources.

Recommendations for state governments (1/2)

4. Governance

- **4.e. Set up PMUs for operationalization of auctioned blocks:** PMUs to be set up for earlier operationalization of auctioned blocks. PMUs should act as a single point of contact for stakeholders to coordinate with various government departments. They should assist mining companies in obtaining necessary clearances, including environmental, forest, wildlife, and land acquisition approvals.
- **4.f. Star ratings for minor minerals:** Star rating scheme should be introduced in all states for minor minerals to promote responsible mining practices and ensure that minor mineral mining operations align with environmental, social, and governance (ESG) principles.
- **4.g. Utilization of wastes and abandoned mine mgmt:**
  - Encouraging lessees for effective utilization of mining waste and overburden (OB): Common space outside leases be provided for usages of waste dump by adopting a cluster approach. Mining operations produce significant quantities of waste materials, including overburden (OB), waste rock, tailings, and mineral rejects. Effective utilization of these materials not only minimizes environmental impacts but also presents opportunities for resource recovery and economic gain.
  - Effective management of abandoned mines is critical for addressing environmental hazards, ensuring public safety, and repurposing land for sustainable use.
- **4.h. Empowering district mining offices for governance:**
  - Provide district mining offices with modern tools, such as GIS-based systems, to monitor mining activities and ensure compliance with legal and environmental standards.
  - Build capacity at the local level by training district officials in advanced monitoring technologies and regulatory practices.
  - Create a robust framework for regular audits and inspections to ensure the efficient operation of mining leases.
- **4.i. DMF monitoring extended to KPIs for outcomes:** Use of DMF for social welfare of the region and the local communities should be monitored. DMF should be dedicatedly utilized for providing direct benefits to the inhabitants of mining areas and improvement of their livelihood in the long term by creating SME clusters suited to the occupational practices of the local community for creating local entrepreneurs and employment opportunities.

5. People and capability

- **5.d. Strengthen state DMGs for technical capacity building:** There is an urgent need for upgrading and capacity building of DMGs to have technical and administrative competencies for carrying out the exploration and miningrelated activities. Strengthening the technical and administrative capacities of the State Directorate of Mines and Geology (DMGs) is essential for the continued growth and success of the mining sector. By investing in training, technological adoption, and institutional reforms, DMGs can enhance their ability to manage mining activities effectively.

07

Appendix

Annexure-1:

NON-COAL MINERAL BLOCKS:
Summary of the successful auction
(as on 14.01.2025)

Total mineral blocks (ML and CL) proposed for auction (including annulled)	1301[1]
Actual number of mineral blocks (ML and CL) offered for auction	465
Blocks auctioned (Composite Licence (CL) and Mining Lease (ML)	442
(I) Composite Licence (CL) ▪ Deep-seated minerals / base metals and associated minerals / critical and strategic minerals ▪ Surficial minerals	153 (Licence granted / executed: 35) 56 (20 critical minerals) 97 Of the 153 blocks auctioned, 62 are G4 category blocks from the 287 Geological reports handed over by Geological Survey of India (GSI) to State Governments for composite licence (CL) blocks.
(II) Mining Lease (ML) ▪ Deep-seated minerals / base metals and associated minerals / critical minerals ▪ Surficial minerals ❖ Greenfield / virgin blocks (including 12 deep-seated / high-value / critical minerals) ❖ Karnataka : 'C' Category iron ore mines ❖ Auctioned working leases / mines expired from 2020–2023 in the State of Chhattisgarh (1), Goa (1), Jharkhand (1), Karnataka (11), Odisha (25) and Rajasthan (1)	289 12 (4 critical minerals) 277 229[2] – Out of which only 15 are operational 20 – Out of which 9 are operational 40 – Out of which 30 are operational in ❖ Chhattisgarh : 1 ❖ Goa : 1 ❖ Karnataka : 4 ❖ Odisha : 24[3]
Section 10A(2)(b) and 10A(2)(c) of MMDR Act, 1957 mining leases expired as per MMDR Amendment Act, 2021 Section 10A(2)(b) = 572 Section 10A(2)(c) = 196 768	27 blocks auctioned CL → 15 ML → 12
Number of auctioned mines in production	**Greenfield** 1. Andhra Pradesh : 4 2. Chhattisgarh : 2 3. Gujarat : 2 4. Madhya Pradesh : 2 5. Odisha : 2 6. Rajasthan : 3 Total : 15 **Brownfield** 1. Goa : 1 2. Chhattisgarh : 1 3. Karnataka : 13 4. Odisha : 24 Total : 39 TOTAL : 54 (Greenfield and Brownfield)

Source: FIMI analysis based on Ministry of Mines and Parliament questions; MSTC website

Notes: 1. It includes the number of attempts and annulment of mineral blocks. The State Governments of West Bengal, Punjab, Himachal Pradesh, Haryana and Kerala have not offered any block for auction since 2015.

2. **Andhra Pradesh:** 1 Limestone block has been surrendered.
3. **Odisha:** 2 mineral blocks reserved to Odisha Mining Corporation (OMC) after surrendering by JSPL and Shyam Ores Jharkhand Private Ltd.

Annexure-2:

INDIA: ROYALTY RATES OF SELECT MINERALS

Name of the Mineral	Rate of Royalty
Andalusite	12% *ad valorem*
Bauxite	(i) **Metallurgical Grade** : 0.60% of LME aluminium metal price chargeable on the contained aluminium metal in ore produced for those dispatched for use in alumina and aluminium metal extraction, (ii) **Non Metallurgical Grade** : 25%
Beryllium	Two per cent of the average sale price of Beryllium metal chargeable on the Beryllium metal contained in the ore produced
Cadmium (primary)	Four per cent of the average sale price of Cadmium metal chargeable on the Cadmium metal contained in the ore produced
Coal	14% *ad valorem*
Cobalt (primary)	Four per cent of the average sale price of Cobalt metal chargeable on the Cobalt metal contained in the ore produced
Chromite	15% *ad valorem*
Copper	4.62% of LME copper metal price chargeable on the contained copper metal in ore produced
Diamond	11.5% *ad valorem*
Dolomite	Rs. 75 / tonne
Gallium (primary)	Four per cent. of the average sale price of Gallium metal chargeable on the Gallium metal contained in the ore produced
Glauconite and potash	2.5% of price for Muriate of Potash published by the Government of India, Ministry of Chemicals and Fertilizers, Department of Fertilizers chargeable on the contained K2O in ore produced for those dispatched for making such Muriate of Potash.”;
Gold	4% of London Bullion Market Association price chargeable on the gold metal in ore produced
Graphite	(i) **With 80 per cent. or more fixed carbon** : Rs. 225/tonne (ii) **With 40 per cent. or more fixed carbon but less than 80 per cent. fixed carbon** : Rs. 150/tonne (iii) **With 20 per cent. or more fixed carbon but less than 40 per cent. fixed carbon** : Rs. 65 / tonne (iv) **With less than 20 per cent. fixed carbon** : Rs. 25/tonne
Indium	Two per cent. of the average sale price of Indium metal chargeable on the Indium metal contained in the ore produced
Iron ore	15% *ad valorem*
Kyanite	12% *ad valorem*
Lead	8.5% of London Metal Exchange Lead metal price chargeable on the contained lead metal in ore produced
Limestone	Rs. 80 – Rs. 90 / tonne
Lithium	3% of London Metal Exchange price on Lithium metal in the ore produced
Manganese ore	15% *ad valorem*

Annexure-2:

Name of the Mineral	Rate of Royalty
Molybdenum	7.5% of London Metal Exchange Molybdenum metal price chargeable on the contained Molybdenum metal in ore produced
Monazite	Rs. 125 / tonne
Nickel	0.12% of London Metal Exchange Nickel metal price chargeable on the contained nickel metal in ore produced
Niobium	3% of average sale price of Niobium metal
Platinum Group of Metals	**(i) Platinum and Palladium** : 14% of London Bullion Market Association price chargeable on the Platinum and Palladium metals in ore produced **(ii) Rhodium, Iridium and Ruthenium** : 14% of Johnson Matthey Precious Metals Management price chargeable on the Rhodium, Iridium and Ruthenium metals in ore produced **(iii) Osmium** : 14% of Osmium-Preis.com price chargeable on the Osmium metal in ore produced
Rare Earth Elements	1% of average sale price of Rare Earth Oxide (REO) chargeable on the Rare Earth Oxide contained in the ore produced
Rhenium	Two per cent of the average sale price of Rhenium metal chargeable on the Rhenium metal contained in the ore produced
Selenium (primary)	Four per cent. of the average sale price of Selenium metal chargeable on the Selenium metal contained in the ore produced
Sillimanite	12% *ad valorem*
Tantalum (produced from ores other than Columbite-tantalite)	Four per cent of the average sale price of Tantalum metal chargeable on the Tantalum metal contained in the ore produced
Tellurium	Two per cent of the average sale price of Tellurium metal chargeable on the Tellurium metal contained in the ore produced
Tin	7.5% of London Metal Exchange Tin metal price chargeable on the contained tin metal in ore produced
Titanium (produced from ores other than Brown Ilmenite (Leucoxene), Ilmenite and Rutile occurring in Beach Sand Minerals found in teri or beach sands) (primary)	Four per cent of the average sale price of Titanium metal chargeable on the Titanium metal contained in the ore produced
Tungsten	Three per cent of the average sale price of Tungsten Trioxide (WO_3) on contained WO3 per tonne of ore on pro rata basis
Vanadium (primary)	Four per cent. of the average sale price of Vanadium Pentoxide on contained V_2O_5 per tonne of ore on pro rata basis
Vermiculite	5% *ad valorem*
Wollastonite	15% *ad valorem*
Zinc	9.5% of London Metal Exchange Zinc metal price chargeable on contained zinc metal in ore produced
Zircon	Two per cent of average sale price on ad valorem basis

Annexure-3:

WORLD: ROYALTY REGIME

Country	Corporate income tax	Mining taxes and royalties						
		Method	Bauxite	Coal	Copper	Gold	Iron ore	Manganese ore
Argentina	35%	R	NA	3%	NA	3%	3%	3%
Australia	30%	R	10%–75% of value of bauxite	2.5%–15.0%	2.5%–7.5%	2.5%–5%	2.5%–7.5%	5% -7.50% (Western Australia)
Brazil	34%	R	3%	NA	2%	1.50%	3.5%	3%
Canada	23%–31%	P	NA	2%–16%	1%–17%	1%–17%	1%–17%	NA
Chile	27%	P	NA	5%–14%	5%–14%	5%–14%	5%–14%	NA
China	25%	R	3%–9%	2%–10%	2%–10%	2%–6%	1%–9%	2%
Colombia	35%	P/R	NA	10%	NA	12%	5%	NA
Ghana	25%	P/R	NA	5%	5%	5%	5%	5%
Guinea	25%	R	0.075%	NA	NA	5%	3%	NA
Indonesia	22%	R	NA	0%–13.5%	2%–5%	3.75%–5%	10%	3.25%
Mexico	30%	P	NA	7.50%	7.50%	0.5%–7.5%	7.5%	NA
Mongolia	25%	R	NA	2.5–5%	5%	2.5%–5%	5%	NA
Peru	29.5%	P	NA	1%–12%	1%–12%	1%–12%	1%–12%	NA
South Africa	27%	R	NA	0.5%–7.0%	0.5%–5%/7%	0.5%–5%	0.5%–7%	7%
USA	21%–33%	P/R	NA	8%–12.5%	1%–7%	0%–7%	0%–7%	NA
India	**25%–30%**	**R**	**0.60%***	**14%**	**4.62%***	**4%****	**15%**	**5%**

Source: **(1) For Corporate Income Tax (CIT)** : PWC
(2) For royalty rates in World: PWC, Mineral Council of Australia (MCA); CSEP – Mineral Royalty Rates in India : Comparison with other countries
(3) For royalty rates in India: Ministry of Mines
Key R: Revenue basis; **P:** profit or net basis
*: Linked to London Metal Exchange; ** Linked to London Bullion Market Association

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