



## **EXPERT ROUNDTABLE**

10 March 2026

# **Strengthening Minerals Ecosystem in India: Regulatory and Policy Options**

**SUMMARY OF DISCUSSIONS**

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**Dravya, the IIHS Centre for Materials and Sustainable Development**, builds on the significant work done by IIHS in shaping global discourse and domestic policy and practice in the field of sustainable development. Launched in November 2025, Dravya aims to lead cutting-edge applied research and foster dialogue on the strategic role of minerals and materials in advancing India's ambitious growth, development and decarbonisation goals, and take steps towards driving transformative change propositions for a prosperous, sustainable and just future.

Against this backdrop, Dravya has launched the Dravya Dialogues series, beginning with an inaugural Expert Roundtable on 10 March 2026 in New Delhi on 'Strengthening the Minerals Ecosystem in India', which brought together 15 experts from policy, industry, practice, research, and academia for a cross-sectoral and multidisciplinary discussion.

The roundtable highlighted that India's minerals debate must move beyond questions of resource availability, towards an integrated, value-chain approach that spans exploration, technology, circularity, governance, social justice, and international trade. The rest of this note organises the key insights from the discussion along these dimensions, moving from strategic demand–supply questions to system capabilities, regulatory frameworks, social and environmental considerations, and India's international positioning.



## **KEY TAKEAWAYS**

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**Demand–Supply Dynamics**

**Exploration and Prospecting**

**Technology and R&D**

**Recycling and Circularity**

**Regulatory and Policy Gaps**

**Social and Environmental Governance**

**International and Trade Perspectives**



## Demand–Supply Dynamics

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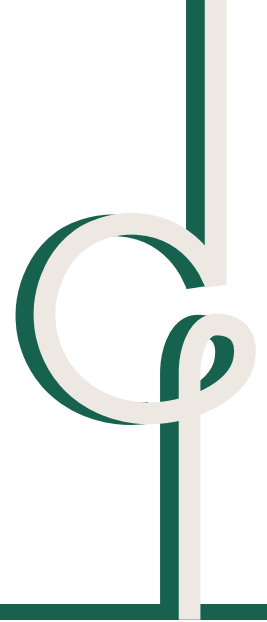
- Strategic coherence is needed between near-term industrial and infrastructure imperatives, and long-term resource planning for growth and net-zero commitments, so that decisions on mining, processing and imports are not taken in isolation.
- Demand is complex and uncertain, shaped by shifts in technology, sectoral constraints, and macroeconomic change. India must distinguish between demand requirements (for development and decarbonisation) and demand commitments (from existing pipelines and policies). Conflating the two can either overstate or understate future mineral needs, leading to misaligned investment and stockpiling decisions.
- Logistics and infrastructure gaps in rail, power and water—combined with spatial separation between mining and processing hubs—increase costs, slow project implementation, and undermine the global competitiveness of mineral-based industries.
- The proposed stockpiling under the National Critical Mineral Mission (NCMM) needs clearer objectives—whether to buffer domestic supply risks, influence global markets, or support strategic sectors—in addition to clarity on governance arrangements. Decisions on stockpiling and broader supply security must be guided by robust, disaggregated data on production, trade flows, origin–destination chains and subnational net-zero trajectories.



## Exploration and Prospecting

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- India must scale up systematic geochemical mapping, and deepen exploration—particularly for deep-seated mineral systems, where many REEs and critical minerals occur—moving beyond a traditional emphasis on easily accessible deposits, which captures only a fraction of India’s geological endowment and misses deep-seated and unconventional systems where many REEs and critical minerals lie.
- Scientific approaches such as mineral systems analysis, backed by higher funding, modern equipment and institutional capacity development, can improve discovery outcomes and help reverse stagnant or declining resource positions in several commodities.
- Secondary resources are underutilised; red mud from bauxite refining and low-grade nickel deposits are key examples where valuable minerals remain stranded due to technological, regulatory, and commercial barriers, despite lower marginal environmental and social costs than new greenfield mines.
- Weak risk capital flows, uncertain and commercially unattractive licences, limited geological data packages, and unpredictable approval timelines deter private exploration and limit diversification of actors. More credible and transparent data, predictable regulatory processes, and better-aligned market signals are needed to attract exploration finance, and build a more resilient and diversified resource base.



## Technology and R&D

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- Rare Earth Elements (REE) and critical mineral exploration and processing are technologically intensive and capital heavy; however, India's R&D ecosystem is underfunded and fragmented, with limited private sector participation and incentives for industry–research collaboration.
- Technical bottlenecks are most severe at beneficiation and purification stages, where the ability to consistently achieve required mineral grades at scale often determines economic viability and integration into global value chains.
- Technologies that enable production from low grade deposits and complex ores are crucial for resource security, especially for minerals where high-grade reserves are limited or geographically concentrated.
- Substitution and dematerialisation—through development of alternative materials, more efficient product design, and reduced material intensity—can moderate exposure to resource constraints, price volatility, and geopolitical risk.
- Circularity should be embedded at the design stage via product and process choices that enable disassembly, repair, recycling and repurposing (for e.g., recyclable battery chemistries and solar technologies that avoid hard-to-recover components).



## Recycling and Circularity

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- Recycling can meaningfully contribute to meeting rising mineral requirements, particularly for metals with high recovery potential, but cannot fully substitute the need for virgin extraction in a rapidly growing economy like India.
- Governance of recycling is fragmented across institutions, with parallel initiatives (such as mining sector recycling schemes and e-waste rules) lacking an integrated framework for common standards, enforcement mechanisms, and economic incentives.
- The scale and characteristics of waste from net-zero transitions—ranging from batteries and solar modules, to EV and grid components—are insufficiently understood; distinct recycling pathways for these streams must be modelled in advance.
- Capacity and financing constraints, especially for informal and small-scale recyclers, call for patient capital, structured capacity building, risk-sharing instruments, and pathways for formalisation that do not undermine livelihoods.
- Robust and standardised recycling and stock-and-flow data systems are needed to guide policy, investment, and technology choices, with early examples showing that better data can reveal both material recovery opportunities and systemic risks.



## Regulatory and Policy Gaps

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- Minerals governance is constrained by institutional gaps, legacy issues in key agencies, and fragmented mandates across ministries and tiers of government, producing overlapping responsibilities and impacting policy coherence.
- Ambiguity between different reporting and classification standards (for e.g., UNFC and CRIRSCO) and frequent changes in HSC codes create confusion for investors and analysts, hindering long-term data harmonisation and transparency.
- Policy prioritisation has historically favoured bulk minerals (such as iron ore and limestone) over critical minerals, leading to delayed, reactive and sometimes piecemeal interventions in segments that are central to energy transition and advanced manufacturing.
- Auction frameworks, the main gateway through which private actors access mineral resources, often suffer from weak geological data, cumbersome clearances and rigid bidding rules, leading to delayed project pipelines and under-realisation of India's geological potential.
- Systemic barriers—sub-judice land and environmental disputes, regulatory delays, trust deficits, and local resistance—raise compliance costs, particularly for smaller firms and new entrants, and discourage long-term, patient investments.
- States increasingly use minor minerals for revenue mobilisation through permits and royalties, sometimes overshadowing sustainability, contributing to over-extraction and concentrating environmental violations among small leaseholders.
- There is a need for more granular, adaptive and transparent policy design, including alternative bidding models, reformed mineral indices, clearer EPR regimes and stronger alignment between legal frameworks, regulatory reforms and trade agreements.



## Social and Environmental Governance

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- Governance of minor minerals is fragmented across institutions and administrative levels, resulting in coordination issues, overlapping jurisdictions and weak accountability in many states and districts.
- Mining operations impose significant social and environmental costs, including dust pollution from uncovered ore transport, traffic hazards, noise, and inadequate mine-site safety infrastructure, which directly affect health and daily life. These impacts, in turn, shape mobility, access to education, and livelihoods in mining-affected areas, for instance when heavy vehicle movement and unsafe roads discourage children from walking to school, or limit women's mobility.
- Rehabilitation and resettlement processes are often opaque; displaced communities may lack clarity on the location, quality and legal status of land allotments and entitlements, and frontline officials may also face information and capacity gaps.
- Land titles and benefit-sharing arrangements are complicated by intra-family disputes, weak documentation, and structural socio-legal constraints, reducing the effectiveness of compensation and long-term livelihood restoration.
- Labour and environmental violations remain areas of concern, particularly in clusters of small mines, even as enforcement has intensified in some regions, indicating the need for more systematic and preventive approaches.
- A holistic sustainability lens is needed that integrates social protection, water security, land rights, and ecological stability into exploration, extraction and processing decisions, ensuring that minerals policy is aligned with broader development goals.



## International and Trade Perspectives

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- Successful global minerals strategies are typically grounded in methodical, science-led planning, combined with the willingness to learn from mistakes and adjust course in response to new information and technologies.
- Countries such as Canada and Australia strengthen investor confidence through independent validation of exploration data, predictable regulatory environments and system-driven, market-responsive governance, whereas India's lack of comparable credibility mechanisms raises perceived risk and narrows the pool of investors and partners.
- Minerals trade analytics are increasingly important to track import dependency, supplier concentration, price volatility, and exposure to geopolitical disruptions, informing stockpiling, diversification and industrial strategy.
- Policymaker awareness of minerals trade and its intersections with industrial and climate policy has grown, but broader sectoral competitiveness remains constrained by structural inefficiencies across logistics, regulation, technology, and social licence to operate.
- Long-term transformation will require strategic persistence, coherent and coordinated policymaking, investment in institutional capacity and data systems, and careful adaptation of global best practices to India's specific developmental and distributive priorities.

## CONCLUSION

Taken together, the discussions underscored that India's materials agenda is no longer a narrow question of reserves and extraction, but a complex system challenge that spans demand planning, exploration strategies, technological capabilities, circularity, regulation, and questions of justice. Addressing this challenge will require moving from fragmented, commodity-specific interventions to a coherent ecosystem approach that links upstream geological knowledge and innovation with downstream industrial, social and environmental outcomes.

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## About IIHS

Established in 2008, the Indian Institute for Human Settlements (IIHS) is a national knowledge institution committed to the equitable, sustainable, and efficient transformation of Indian settlements, delivered through cutting-edge research, practice, capacity development, and digital blended learning.



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