

Challenges in Developing Mineral Reserves in the Indian Mining Industry

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Safety First

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Education

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- Educational centers in India
- Curriculum
- Mineral Economics
- Mine Planning and Design
- Reports
- Fact Sheets



Training

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- Knowledge and skill upgrades
- Role of professional associations
- Role of international interaction
- Importance of case studies

Qualifications	2009-2017	2009-2025
Geoscientists	~500	~1,000
Graduate Engineers	~8,000	~15,000
Diploma Engineers	~30,000	~60,000
Tradesmen	~45,000	~95,000
TOTAL	~85,000	~170,000



Regulations

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- Prescriptive Design Rules
- Relaxation in Special Cases
- Role of Consultants
 - Deciphering rules
 - Seeking exemptions
 - Interfacing with regulators



Estimating Costs

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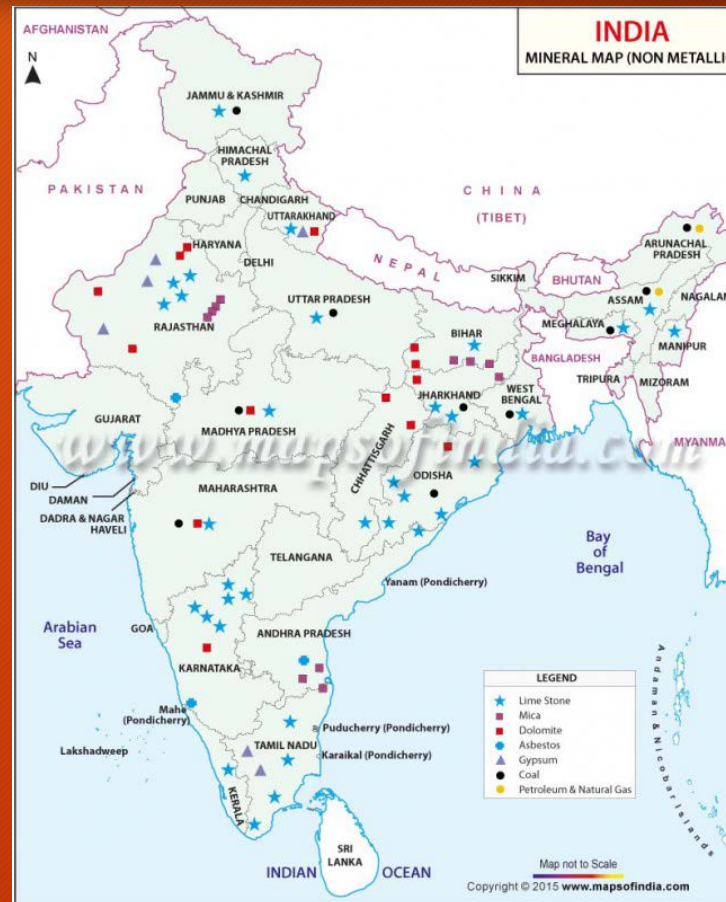
- Standards for Cost Estimation
- Reliable and Updated Databases
- Definition of Capital and Operating Costs
- Components of Costs
- Local Variations
- Importance of Life Cycle Costs Analyses



Information

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- Transparency
- Adequacy
- Digital Data
- Standards for Cost Estimation
- Case Studies



Ownership

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- Public and Private Sector
- Large and Medium Sectors
- Small Scale Mining Sector
- Investors and Owners

Sector	No of Leases	% of total leases	Area in Hectares	% of total area
Public	294	7.6	103317	30.4
Private	3574	92.4	236655	69.6
Total	3868	100.0	339972	100.0



- Applied ethics and system of moral principles that apply to the practice of engineering.
- Examines and sets the obligations by engineers to society, to their clients, and to the profession.
- Adherence to standards
- Doing the right thing
- Transparent and auditable
- Checkboxes and Validation Points



India is Open for Business

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- Needs standards and monitoring
- Self-assessment and continuous improvement
- Integration of data sources
- Integration of agencies
 - Professional Associations
 - Education and Research Institutes
 - Regulatory Agencies



Thank you



IIT Kharagpur

- Development of Mineral Deposits
- Mine Surveying
- Rock Mechanics
- Mine Ventilation
- Surface Mine Design
- Underground Mine Design
- Rock Excavation and Tunneling
- Economics of Mining Enterprises
- Mining Machinery

University of Arizona

- Introduction to Mining Engineering
- Geomechanics
- Mine Ventilation
- Surface Mine Design
- Underground Mine Design
- Underground Mine Safety
- Rock Excavation
- Mine Examination and Valuation
- Equipment Operations Technology

