

Exploration and Mining Opportunities in India

An Investor Guide

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Ministry of Mines, Government of India

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Abbreviations

CL	Composite License
CRIRSCO	Committee for Mineral Reserves International Reporting Standards
DMF	District Mineral Foundation
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GSI	Geological Survey of India
IBM	Indian Bureau of Mines
INR	Indian Rupee
IT	Income Tax
km	kilometre
m	metre
MAT	Minimum Alternate Tax
MCDR	Mineral Conservation and Development Rules, 1988
MCR	Mineral Concession Rules, 1960
ML	Mining Lease
MMDR	Mines and Minerals (Development & Regulation) Act, 1957
MT	Million Tonne
NERP	Non-Exclusive Reconnaissance Permit
NGCM	National Geo-chemical Mapping Programme
NGPM	National Geo-physical Mapping Programme
NMET	National Mineral Exploration Trust
OGP	Obvious Geological Potential
SEZ	Special Economic Zone
sq. km.	square kilometres
UNFC	United Nations Framework Classification
USD	US Dollar

Conversion

lakh	0.1 million
crore	10 million

1 Introduction to India



Exploration Ship of GSI: Samudra Ratnakar

1.1 Geography

India is the seventh largest country in the world by area, with an area of 3.2875 million square kilometres (sq. km.). The mainland of India extends between latitudes 8° 4' and 37° 6' north, longitudes 68° 7' and 97° 25' east and measures about 3,214 km from north to south between the extreme latitudes and about 2,933 km from east to west between the extreme longitudes. It is bound by the Indian Ocean on the South, the Arabian Sea on the South-West and the Bay of Bengal on the South-East. India shares land borders with Pakistan to the West; China, Nepal and Bhutan to the North-East; and Myanmar and Bangladesh to the East. India has coastline of 7,516.6 km.

1.2 Political System

India is a federal state organised into 29 states and 7 union territories. India is the world's largest democracy governed by the Constitution of India with a bicameral parliamentary form of government. The federal government comprises three branches.

- **Executive** – the President of India is the Head of the State, while the Prime Minister is the Head of the Government and runs office with the support of the Council of Ministers.

India | Snapshot



Capital	New Delhi
Population	1,210 million in 2011
Area	3.2875 million sq. km.
Languages	22 languages Official Language – Hindi English is used for all official purposes
Currency	Indian Rupee (₹)
Time Zone	Indian Standard Time GMT + 05:30
Religion	Hinduism (~80%), Islam (~13%), Christianity, Sikhism, Buddhism, Jainism and others.
Gross Domestic Product (at current prices)	USD 2,067 billion in 2014*
Gross Domestic Product (at purchase power parity)	USD 7,393 billion in 2014*
GDP per capita (at current prices)	USD 1,631 in 2014*
GDP per capita (at purchase power parity)	USD 5,833 in 2014*
Accounting Year	April 1 to March 31

*Source: World Bank

- **Legislative** – The Indian legislature comprises the Lok Sabha (House of the People) and the Rajya Sabha (Council of States) forming both the Houses of the Parliament. The Rajya Sabha has a maximum of 250 nominated representatives. The Lok Sabha comprises representatives of people elected every five years through universal adult suffrage. Maximum strength of the Lok Sabha is 552 members and the current strength of the Lok Sabha is 545.

- **Judicial** – The Supreme Court of India is the apex body of the Indian legal system followed by the High Courts of respective States and subordinate Courts.

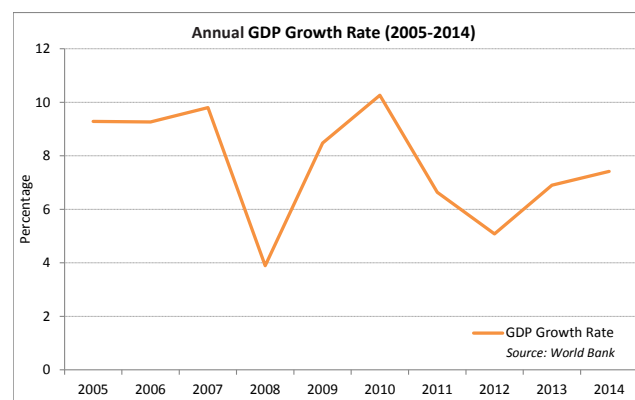
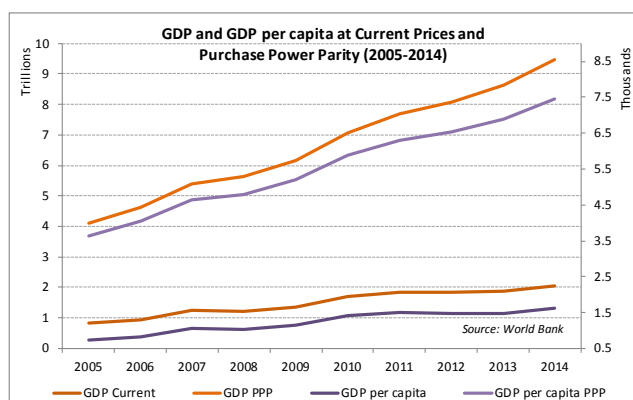
1.3 Economy of India

The Indian Rupee (symbol: ₹, ISO code: INR) is the official currency of India. The exchange rate of Rupee is market determined and the Reserve Bank of India intervenes as and when required to maintain a stable exchange regime (i.e. managed float). As per the World Bank, the GDP of India expanded from USD 834 billion (at current prices) in 2005 to USD 2,067 billion in 2014 (at

current prices). Whereas on the basis of purchasing power parity, the GDP of India expanded from USD 3,274 billion in 2005 to USD 7,393 billion in 2014. During the last decade, India witnessed a consistent growth rate above 6% except in two years due to various macro-economic conditions.

The sovereign debt is classified as investment grade by the following major credit rating agencies.

- Standard & Poor's: BBB- (Positive Outlook)
- Fitch Ratings: BBB- (Stable Outlook)
- Moody's Ratings: Baa3 (Positive Outlook)



2 Exploration and Mining in India



2.1 Introduction

During the last decade, India had witnessed a consistent high growth above 6% mainly due to rapid urbanization that has increased demand for infrastructure and consumer goods. This demand led to more than two fold increase in crude steel production from 32.6 million tonnes (MT) in 2004 to 81 MT¹ in 2013 and demand for metals and minerals in general.

India, being the seventh largest country in the world, is well endowed with various mineral resources. Government of India has recently enacted amendments to Mines and Minerals (Development & Regulation) Act, 1957 (MMDR) and notified rules that would help in overcoming many challenges associated with the minerals and mining sector such as low level mineral exploration and exploitation, low technology deployment, fragmented and small concession areas etc. India is poised to witness great leaps of growth in minerals and mining sector with the adoption of transparent and non-discretionary grant of mineral concessions through an auction process.



2.2 Structure of Minerals and Mining Sector

The Ministry of Mines (MoM), Government of India is responsible for the entire minerals and mining sector in the country that includes legislation, administration, policy formulation etc. in respect of all mines and minerals other than coal and lignite, natural gas and petroleum, but including offshore minerals. In India, the minerals are classified as minor minerals and major minerals. The power to frame policy and legislation relating to minor minerals is entirely delegated to the State Governments while policy and legislation relating to the major minerals is dealt by the MoM. All the mineral legislations in the country conform to the provisions of the MMDR Act, 1957. MoM through its attached office, Geological Survey of India (GSI) facilitates exploration, geological mapping and mineral resource assessment in the country. Indian Bureau of Mines (IBM), a subordinate office of the MoM is mainly responsible for regulation of mining in the country. Mineral concessions in India are granted to Indian nationals or entities incorporated in India

1. Source: World Steel Association

only. The entire sector is organised as depicted graphically below.

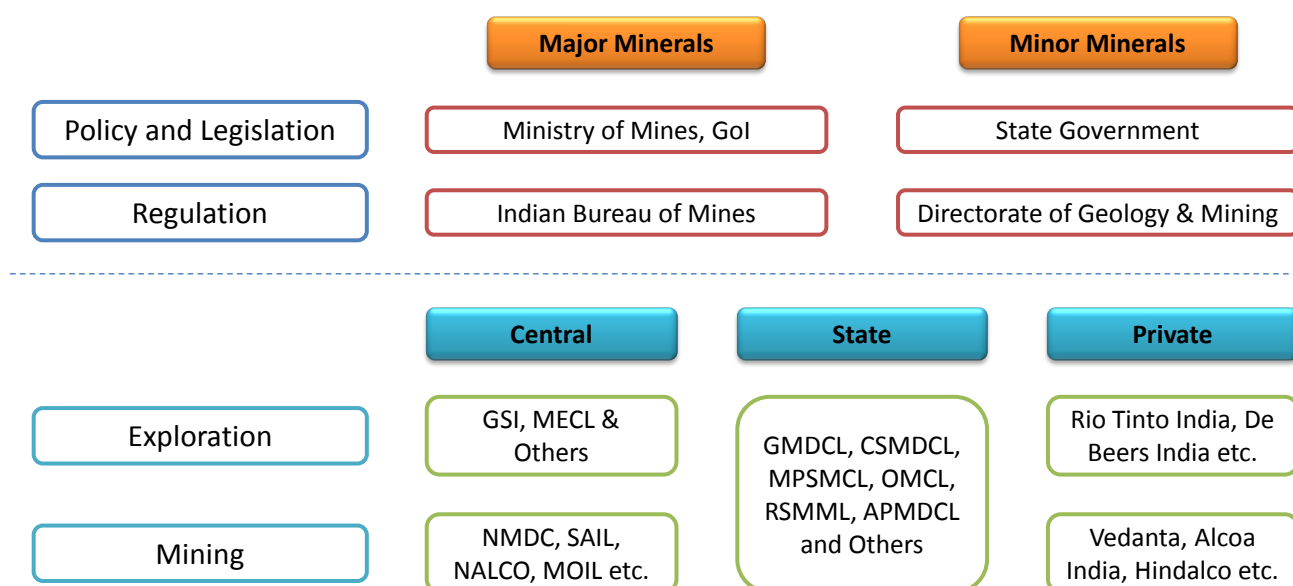
2.3 Exploration in India

India is a mineral rich country and has favourable geological milieu which is yet to be fully explored, assessed and exploited. Its geological setup is similar in many ways to that of resource rich countries like Canada, Australia, Brazil, South Africa, Chile and Mexico etc. Exploration activities in India are mostly carried out by GSI, MECL, various State DGMs, public sector undertakings (PSU) and private sector entities both domestic and subsidiaries of many global companies.

GSI, established in 1851, is the principal agency for geological mapping and regional mineral resource assessment in India. India has a total land area of 3.2875 million sq. km. spread across 5,065 topo sheets and an area of 3.146

million sq. km. is mappable and GSI has covered 3.09611 million sq. km. (98.41%) on 1:50,000 scale till March 31, 2013. GSI has identified 0.571 million sq. km. as Obvious Geological Potential (OGP) area for minerals. A major part of this OGP area is yet to be fully explored.

Most of the exploration activities in the country are of conventional type with restricted input from geochemistry, geophysics and remote sensing. The finds so far, are located near the surface (mostly up to a vertical depth of 100 m). Therefore, with fast depletion of easily accessible and shallow or near surface ore bodies and decline in the rate of locating new mineral deposits within shallow depths, the challenge lies in identifying new area for locating near surface deposits and “deep seated” and “concealed/hidden” ore bodies through modern and sophisticated exploration methods/ techniques on the basis of conceptual studies.



APMDCL – Andhra Pradesh Mineral Development Corporation Ltd.
 CSMDCL – Chhattisgarh State Mineral Development Corporation Ltd.
 GMDCL – Gujarat Mineral Development Corporation Ltd.
 GoI – Government of India
 MECL – Mineral Exploration Corporation Ltd.
 MOIL – MOIL Ltd.

MPSMCL – Madhya Pradesh State Mining Corporation Ltd.
 NALCO – National Aluminium Company Ltd.
 NMDC – National Mineral Development Corporation Ltd.
 OMCL – Odisha Mining Corporation Ltd.
 RSMML – Rajasthan State Mines & Minerals Ltd.
 SAIL – Steel Authority of India Ltd.

India has more than 7,500 km. long coastline and the territorial waters cover more than 0.15 million sq. km. Seabed resources of these areas and the Exclusive Economic Zone (EEZ) covering about 1.87 million sq. km. have also come to light in recent years. If legal continent shelf is taken into account, total offshore area would become about 3.09 million sq. km. This may also require exploration of resources.

In the off-shore area, Marine and Coastal Survey Division of GSI and National Institute of Oceanography are the main institutes which are carrying out preliminary offshore exploration for economic minerals. The explorations were mainly carried out for economic heavy minerals (HM), construction sand, phosphatic nodules/sand, lime mud and polymetallic nodules.

To boost mineral exploration in the country, GSI has initiated the National Geochemical Mapping Programme (NGCM) in 2001. Stream sediment samples are collected on a 1 km × 1 km grid and analysed for 68 elements and the resultant geochemical values are plotted on a 1:50,000 scale base map. GSI also initiated National Geophysical Mapping Programme (NGPM) to generate basic and derived maps of Bouguer Anomaly and International Geomagnetic Reference Field (IGRF) corrected magnetic total field maps of the country on 1:50,000 scale at an observation density of one station per 2.50 sq. km. GSI initiatives also include National Geomorphological and Lineament Mapping Programme, Hyperspectral Mapping, Airborne Survey, Heli-borne Survey, Aeromagnetic Survey, Polar Studies and Marine and Coastal Surveys.

Besides initiating the NGCM and NGPM, GSI has also initiated National Aeromagnetic Survey for the OGP areas and is expects to complete it for the entire country by the end of 2020. GSI has been associated with the Indian Antarctic Programme since the beginning and its scientists regularly participate in the Antarctic expeditions. The Polar Studies Division of GSI carries out regional geological mapping,

Obvious Geological Potential Area	
Mineral	Area (sq. km.)
Gold	1,02,809
Diamond and Precious Stones	3,00,000
Base Metals	1,81,150
Platinum Group of Elements	8,130
Iron ore	5,135
Manganese ore	4,600
Chromite	2,690
Manganese	6,000
Tin and Tungsten	1,300
Bauxite	32,520

thematic mapping and glaciological studies in the Antarctic. Remote Sensing & Aerial Surveys (RSAS) Division of GSI is engaged in multi-sensor airborne surveys since 1965. The Marine and Coastal Survey Division of GSI, besides studying the geomorphology of the sea bed, is involved in the collection of bathymetric, magnetic, seismic and sediment distribution data within the Territorial Water and the Exclusive Economic Zone of India.

2.4 Mineral Resources/Reserves

The data of mineral resources/reserves as per United Nations Framework of Classification (UNFC) for Fossil Energy and Minerals Reserves and Resources 2009 is compiled and maintained by the Indian Bureau of Mines covering the detailed information on various items and deposit-wise mineral inventory. It is updated at regular intervals and published annually in the form of a Mineral Year Book. This report covers mineral prospects/deposits/ mines in freehold and leasehold areas, their status, infrastructure, geology and exploration, ore characteristics, estimated reserve/resource, details of feasibility, details of mining along with production data etc. The data is sourced from various exploration agencies including GSI, State DGMs and public and private sector mining

organisations. This report presently comprises a total of 16,000 deposits of which 8,000 are in freehold areas, 800 in public sector leasehold, 7,100 private leasehold and 100 in partly leasehold.



Airborne Survey Helicopter of GSI: Dhruv

2.5 Mineral Production

India has significantly large resources of iron ore, bauxite, chromium, manganese ore, baryte, rare earths and mineral salts. In India, minerals are broadly classified into minor minerals and major minerals (non-minor). At present, there are more than 3,700 active major mines in India employing over 5 lakh people. India produced 90 minerals that included 4 fuel minerals, 11 metallic, 52 non-metallic and 23 minor minerals in 2012-13. The value of mineral production in 2012-13 was Rs. 2,85,761 crore (approx. USD 44.65 billion), which is about 2.4% of the GDP. Fuel minerals account for 64% of production, metallic minerals 15%, non-metallic minerals 3% and minor minerals 18%.

Mineral	Production World	India	India's Rank
Metallic Minerals			
Bauxite	248.00	15.36	6 th
Chromite	25.80	2.95	3 rd
Iron ore	2,969.00	136.00	5 th
Manganese ore	48.30	2.32	7 th
Metals			
Aluminium	47.00	1.68	8 th
Copper (refined)	20.30	0.49	10 th
Steel (crude/liquid)	1,547.00	78.30	4 th
Lead (refined)	10.50	0.12	15 th
Zinc (slab)	12.60	0.70	3 rd
Industrial Minerals			
Barytes	9.70	1.74	2 nd
Kyanite, alusite & sillimanite	0.41	0.05	4 th
Magnesite	24.50	0.21	11 th
Apatite & rock phosphate	215.00	2.13	13 th
Talc/steatite/ pyrophyllite	7.80	1.18	2 nd
Mica (crude)	0.32	0.001	16 th
Mineral Fuels			
Coal & lignite	7,691.00	604.00	3 rd
Petroleum (crude)	4,008.00	38.00	25 th

3 Mineral and Mining Sector Legislation in India



3.1 Overview

India's mineral and mining sector operates under a federal structure wherein the Central Government formulates the legislation for all minerals except the minor minerals and the State Governments formulate legislation for minerals classified as minor minerals. Government of India permits 100% Foreign Direct Investment (FDI) in exploration, mining, mineral processing and metallurgy through the automatic route, by way of equity participation in a company incorporated in India, for all non-fuel and non-atomic minerals.

India has written legal and constitutional framework to manage the mineral sector. National Mineral Policy provides the direction for mineral sector. Management of mining sector is the responsibility of the Central Government and the State Governments. The State Governments are the owners of minerals occurring onshore. The Constitution bestows power to the Parliament to enact legislation relating to the mining and the States are bound by the Central legislation. The Mines and Mineral (Development and Regulation) Act 1957 is the central legislation in force for regulation of mining operations. The

MMDR Act enables all the State Governments to exercise their powers within a uniform national framework. The State Governments, as owners of onshore minerals, grant mineral concessions and collect royalty, dead rent and fees as per the provisions of MMDR Act, 1957.

In case of offshore areas, the ownership of minerals vests exclusively with the Central Government. In order to regulate the mining and development of minerals in the offshore area, the Parliament has enacted the "Offshore Areas Minerals (Development and Regulation Act, 2002". The Act empowers the Central Government to grant mineral concessions for offshore areas and collect royalty. The Indian Bureau of Mines has been notified as the administrative authority for concession management of offshore areas.

3.2 Legislation

The Mines and Minerals (Development & Regulation) Act (MMDR), 1957 is the principle legislation that governs the mineral and mining sector in India. The MMDR Act, 1957 together with the following rules and legislation comprises the legal framework for this sector.

Mineral Concession Rules (MCR), 1960

The MCR, 1960 defines the process of grant of mineral concessions as per the provisions of Section 13 of the MMDR Act, 1957. The rules lay down the process and timelines for grant of concessions, disposal and refusal of applications and the basic conduct of accounts, registers and information reports.

Mineral Conservation & Development Rules (MCDR), 1988

The MCDR, 1988 prescribes guidelines for the conservation and development of minerals as per the provisions of Section 18 of the MMDR Act, 1957. The rules prescribe procedures for carrying out prospecting and mining operations and the general requirements relating to preparation of mining and prospecting plans and filing of notices and returns. The rules also cover guidelines for protection of the environment.

Mines Act, 1952

The Mines Act, 1952 prescribes the laws relating to the regulation of labor safety in mines, regulations for carrying out mining operations and management of mines. It lays down the basic provisions for health and safety of people employed in mines and regulates their working conditions. It also has provisions relating to inspection of mines and procedure of reporting to be followed.

Mines Rules, 1955

The Mines Rules, 1955 defines the framework for medical examination of persons employed or to be employed in mines, basic health and sanitation provisions and welfare amenities for the miners and their families.

State Minor Mineral Concession Rules

Various State Governments have prescribed rules for the grant of mineral concessions in respect of minerals classified as minor minerals under the MMDR Act, 1957.

Offshore Areas Mineral (Development & Regulation) Act, 2002

The Offshore Areas Mineral (Development and Regulation) Act, 2002, provides for development and regulation of mineral resources in the territorial waters, continental shelf, exclusive economic zone and other maritime zones of India and to provide for matters connected to it.

Offshore Areas Mineral Concession Rules, 2006

The Offshore Areas Mineral Concession Rules, 2006, lay down the process for grant and renewal of reconnaissance permits, exploration licenses and production leases as per provisions of Section 35 of the Offshore Areas Mineral (Development and Regulation) Act, 2002. The rules prescribe for measures for protecting the marine environment and safety measures to be followed in the leased area. The rules also define the operational guidelines for each concession granted under the act.

Recent Developments

The MMDR Act, 1957 was amended through the MMDR Amendment Act, 2015. The amendment that came into force on January 12, 2015 has ushered in the regime of transparent and non-discretionary grant of mineral concessions. The major features of the Amendment Act are:

- Mining Leases will now be granted for a term of 50 years.
- The mineral concessions will now be granted through auction process and will not be renewed after the expiry of the concession.
- The Central Government will prescribe the terms and conditions for grant of mineral concessions through competitive bidding.
- Reconnaissance Permits will henceforth be granted on non-exclusive basis.
- The Central Government has the authority to reserve mines for specific end uses at its discretion.
- District Mineral Foundation is to be set up in each mineral bearing district for local area development.

- National Mineral Exploration Trust is to be set up for regional and detailed exploration in the country.

Government of India is in the process of simplifying and updating the sub-ordinate legislation relating to the mineral and mining sector in India that includes necessary amendments to MCR, 1960 and MCDR, 1988. As a part of this initiative, the Central Government has notified the following rules for implementation of provisions of the MMDR Amendment Act, 2015.

- **Minerals (Evidence of Mineral Contents) Rules, 2015:** Rules that prescribe procedures to be followed for conducting the exploration to determine mineral content so that the mineral blocks could be taken up for auction of mineral concessions.
- **Mineral (Auction) Rules, 2015:** Rules that detail the process to be followed for auction with respect to grant of minerals concessions.
- **Mineral (Non-exclusive Reconnaissance Permits) Rules, 2015:** Rules that detail the process to be followed for grant of Non-exclusive Reconnaissance Permit.
- **National Mineral Exploration Trust Rules, 2015:** Rules that detail the objectives, functions, operations of the National Mineral Exploration Trust.

3.3 Mineral Administration and Regulation

Each State Government takes care of all the mineral administration related matters (such as grant of concessions, collection of royalties and payments etc.) within the state offices distributed over entire state.

Indian Bureau of Mines (IBM)

Indian Bureau of Mines, a subordinate office of the Ministry of Mines is mainly responsible for regulation of mining in the country. It carries out inspection of mines, approves mining plans and mine closure plans and conducts environmental studies to minimise environmental im-

pact due to mining. Besides being a regulator, it also maintains a repository of information relating to minerals and mining activity in the country and all the mines are required to file mandatory returns with IBM. It also prepares mineral maps, mineral resource and reserve inventory and publishes technical and statistical information relating to the minerals and mining activity in the country.

3.4 Types of Concessions

As per the MMDR Amendment Act, 2015, the following three types of concessions could be granted for exploration and mining of minerals. Mining lease granted through auctions is transferable.

1. Mining Lease

This concession is granted through an auction process where the bidder succeeding in the auction can undertake mining operations after obtaining requisite clearances.

2. Composite Licence (Prospecting Licence-cum-Mining Lease)

This licence granted through an auction process where the bidder succeeding in the auction is required to undertake exploration and prospecting work to upgrade the exploration in the mineral concession area within a prescribed time. On establishing the commercially exploitable mineral content in the concession area, the concessionaire can apply for transition to mining lease for undertaking mining operations after obtaining requisite clearances. Composite licence granted through auction is transferable.

3. Non-exclusive Reconnaissance Permit (NERP)

Pursuant to recently notified the Mineral (Non-exclusive Reconnaissance Permits) Rules, 2015, this permit is granted to all the eligible explorers within 30 days from the date of filing of an online application, provided the applicant meets the eligibility conditions and the application is complete in all respects. The permit holder is not be entitled to make any claim for the grant

of any prospecting licence-cum-mining lease or a mining lease.

3.5 Grant of Mining Lease

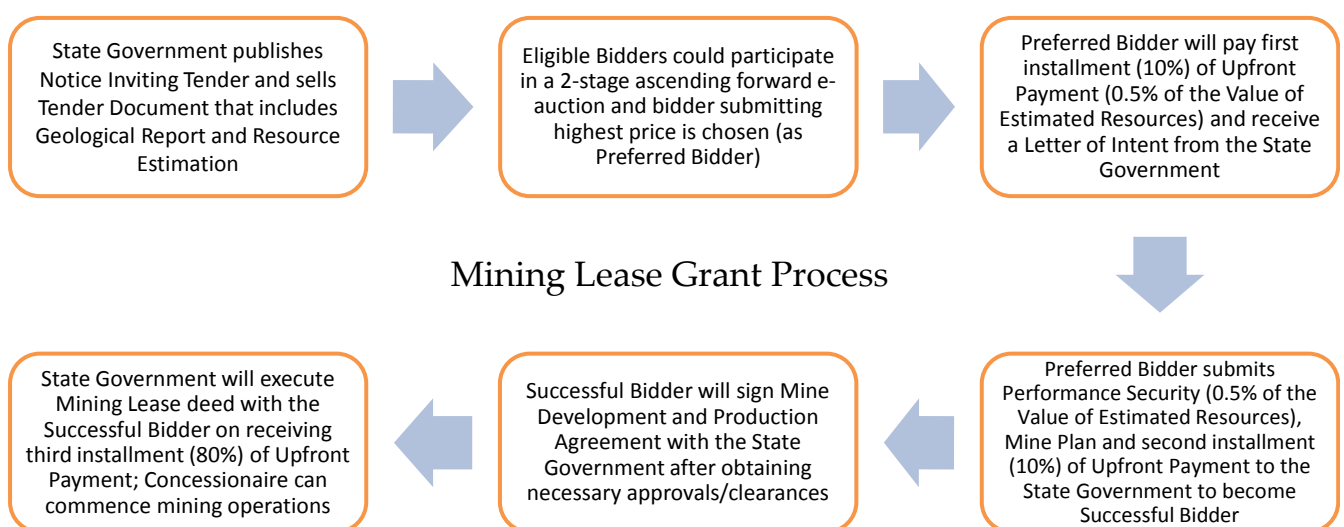
Pursuant to recently notified Mineral (Auction) Rules, 2015, the State Government issues an order notifying an area for grant of Mining Lease. Prior to auctioning the notified area(s), the State Government is required to complete exploration up to G2 level [conforming to UNFC and CRIRSCO standards prescribed under Minerals (Evidence of Mineral Contents) Rules, 2015] and establish indicated mineral resources in the area to be granted under concession. The State Government is also required to prepare Information Memorandum containing Geological Report, precise area maps, cadastral maps etc. and make it available as a part of the Tender Document.

The State Government issues a Notice Inviting Tender where eligible bidders could participate in a 2-round ascending forward online electronic auction process. A bidder is required to quote a percentage (of the value of mineral dispatched) that he is willing to share with the State Government. In the first round of auction, the bidder submits a technical bid and an initial price offer [equal to or more than the Reserve Price i.e. minimum percentage (of the value of mineral dispatched)] and top 50% of the Technically Qualified Bidders or 5 whichever is higher proceed to

the second round of auction. The highest initial price offer discovered in the first round becomes the floor price in the second round and the bidder who submits the highest final price offer is declared as the Preferred Bidder.

The Preferred Bidder receives the Letter of Intent from the State Government on submission of the first instalment (10%) of the upfront payment (i.e. 0.50% of the Value of Estimated Resources). The Preferred Bidder becomes the Successful Bidder on satisfying eligibility conditions, furnishing performance security (i.e. 0.50% of the Value of Estimated Resources) and obtaining necessary approvals and consents. Subsequently, the Successful Bidder needs to submit the second instalment (10%) of the upfront payment and executes a Mine Development and Production Agreement with the State Government. The Mining Lease is executed on payment of the third instalment (80%) of upfront payment.

The upfront payment can be adjusted in full within the first five years of commencement of mineral production. The Mining Lease will be valid for a period of 50 years from the date of execution of Mining Lease. A concessionaire is not permitted to acquire one or more Mining Leases covering a total area of more than ten sq. km. in a particular State. The concessionaire is permitted to extract the other minerals found in the concession area subject payment of applicable levies.



The concessionaire is required to complete detailed exploration and prepare a detailed feasibility study report conforming to the Mineral (Evidence of Mineral Contents) Rules, 2015 over the entire area under the mining lease, within a period of five years from the date of commencement of the Mining Lease.

3.6 Grant of Composite License

State Government issues an order notifying an area for grant of Composite License (i.e. Prospecting License followed by a grant of Mining Lease) after completing exploration up to G3 level [conforming to UNFC and CRIRSCO standards prescribed under Minerals (Evidence of Mineral Contents) Rules, 2015] and establishing inferred mineral resources in the area to be granted under concession. The State Government is also required to prepare Information Memorandum containing Geological Report, precise area maps, cadastral maps etc. and make it available as a part of the Tender Document.

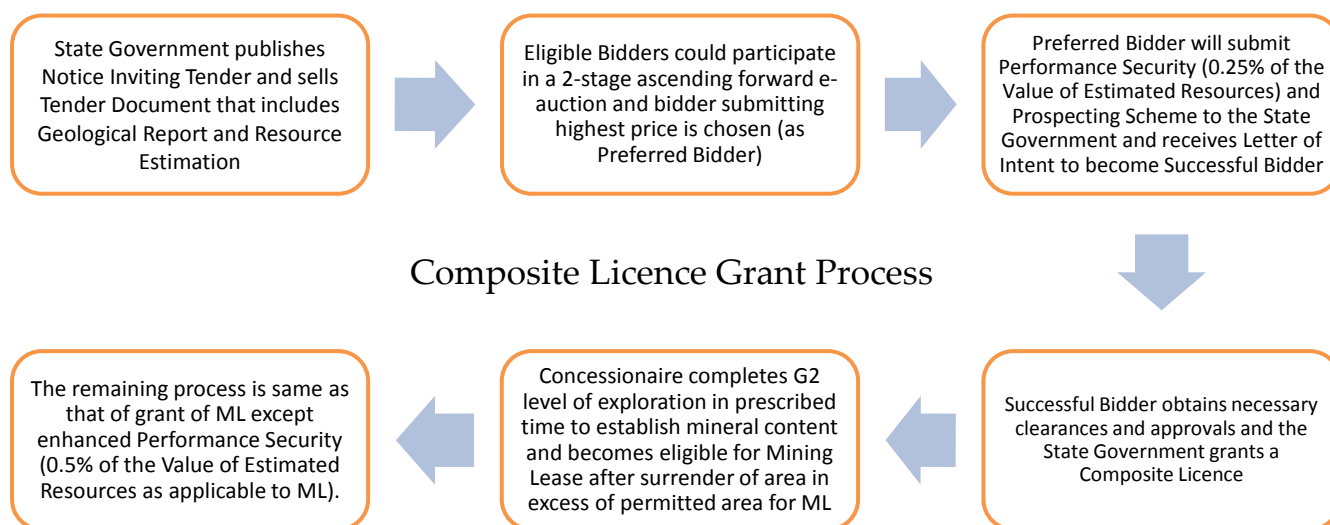
Composite License is also granted through a similar 2-round ascending forward online electronic auction process as followed for the grant of a Mining Lease. After declaration of the Preferred Bidder, the State Government will issue a Letter of Intent on submission of the performance security (i.e. 0.25% of the Value of Estimated Resources) by the Preferred Bidder. The Preferred Bidder be-

comes the Successful Bidder on complying with terms of eligibility, obtaining various approvals and submitting scheme of prospecting. The concessionaire is obliged to complete the prescribed level of prospecting within 3 years (extendable further for a period of 2 years).

The concessionaire will be eligible for grant of a Mining Lease, after establishing the economically extractable mineral content and obtaining necessary clearances and approvals needed for grant of a Mining Lease. The concessionaire is required to follow similar procedure and make payments as applicable to a Mining Lease (as described above). On surrendering the area in excess of maximum area limit permitted for a Mining Lease, the concessionaire can execute a Mining Lease deed. A concessionaire is not permitted to acquire one or more Prospecting Licenses covering a total area of more than twenty five sq. km. in a particular State.

3.7 Grant of Non-exclusive Reconnaissance Permit (NERP)

Pursuant to recently notified Non-exclusive Reconnaissance Permit Rules, 2015, an interested applicant is required to submit an online application to the State Government in a prescribed format accompanied by a fee of Rs. 1,000/- per sq. km. The State Government will grant NERP within 30 days from the date of filing of an appli-



cation and the same will be made available online for the download by the applicant.

The State Government will specify the validity period of NERP at the time of grant and the validity will stand terminated over such area(s) which are notified for grant of concessions through auction. A concessionaire is not permitted to acquire one or more NERPs covering a total area of more than 10,000 sq. km. in a particular State, provided that area granted under a single NERP shall not exceed 5,000 sq. km.

3.8 National Mineral Exploration Trust (NMET)

Realising the need to increase the spend on the exploration activity that would facilitate high growth in the mining sector, GoI has created NMET. NMET will give a fillip to the exploration in the country by undertaking large scale exploration projects. As per the recently notified NMET Rules, the concessionaires (i.e. ML and CL holders) are required to contribute 2% of the royalty amount to the NMET fund. The funds accumulated with the NMET will be utilised to

step up the exploration activities. The NMET will seek expertise from the government entities as well as the private sector. NMET will facilitate large scale deployment of latest technologies in the area of exploration.

3.9 Indicative Clearances

The clearances required for exploring or mining an area under a grant are dependent on the type of concession. A list of indicative clearances, approvals and permits may be included as a part of the Tender Document at the time of auction by a State Government. Some of the mandatory clearances/ approvals, inter alia, required for commencement of exploration or mining operations include:

- Environment and Forest Clearance
- Wildlife Clearance (sanctuary/ reserve/ special zone clearances)
- Land Owner's Consent
- Explosive License
- Permission for Mine Opening
- Transmission line from State Transmission / Distribution Companies



4 Taxation and Royalties

4.1 Overview

The principal taxes/ payments applicable to mining industry in India are:

- **Direct Taxes** – Corporate Income Tax (IT) or Minimum Alternative Tax (MAT).
- **Indirect Taxes** – Custom Duty, Service Tax, Value Added Tax (VAT) etc.
- **Mining Levies** – Royalty or Dead Rent, contribution to National Mineral Exploration Trust (NMET) and District Mineral Foundation (DMF), Surface Rent (if applicable), Application Fee (if applicable) etc.

The taxes/ levies listed above are inclusive and not exhaustive; the actual amount of taxes/ levies may vary depending on the States.

4.2 Direct Taxes

Income Tax (or Minimum Alternative Tax)

As per Income Tax Act, 1961, the Income Tax is applicable for any company incorporated in India or having its management and control in India.

Mineral concessions are granted to only Indian entities. A foreign company is taxed only on the income received in India from Indian operations.

At present, the Income Tax is computed on the basis of basic rate (30%), applicable surcharge (5% or 10% of the basic rate) and an Education Cess of 3% on total tax (i.e. tax computed using basic rate including surcharge).

A company is liable to pay the higher of two ways in which income tax is computed i.e. either at the rate of Minimum Alternative Tax (MAT) or the normal tax rate. MAT is payable at the rate of 18.5% plus applicable surcharge and an Education Cess of 3%.

4.3 Indirect Taxes

Customs Duty

The customs duty is levied on the import of goods into India as per the Customs Act, 1962 and the rates prescribed in the First and Second Schedule of the Customs Tariff Act, 1975. Customs duty is computed on the basis of the value of the import-

Illustration: For an Indian company, the income tax is computed as follows.

Effective IT Rate	Taxable Income of the Company (INR)	Surcharge Applicable (%)
32.445%	Greater than 10 lakh less than or equal to 10 crore	5
33.99%	Greater than 10 crore	10

Basic Rate = 30%

Illustration: For a foreign company, the income tax is computed as follows.

Effective IT Rate	Taxable Income of the Company (INR)	Surcharge Applicable (%)
42.024%	Greater than 1 crore less than or equal to 10 crore	2
43.26%	Greater than 10 crore	5

Basic Rate = 40%

ed goods. The basic components of customs duty on imports are:

- Basic customs duty
- Additional customs duty in lieu of excise duty
- Special additional customs duty in lieu of sales tax/Value Added Tax (VAT)
- Education cess
- Secondary and Higher Education Cess

Mineral imports generally attract lower duties since most minerals are not subject to excise duties and as a result, the additional customs duty in lieu of excise duty is zero. Exports are generally exempt from customs duty.

Export Duty

In exceptional cases, when there is a shortfall in the domestic supply to satiate the domestic demand, the government may regulate the supply of minerals through imposition of export duties.

Service Tax

The Service Tax is levied by the Central Government as per the provisions of the Finance Act, 1994/ 2015 at the rate of 14% on specified services provided by service providers in India. Mining companies may attract service tax for the services availed during exploration, mineral production, handling, transportation etc. Some of the taxable services relevant to the mining industry are:

- Survey and exploration of minerals
- Site formation and clearance
- Excavation, demolition and earth moving services
- Mining of minerals

A service provider paying the tax can claim a refund for the Service Tax paid on its inputs. However, the credit is restricted to providers of taxable services or manufacturers of taxable goods. No credits are available to primary producers or miners, who are neither service providers nor manufacturers. Exporters are allowed to claim a refund of the Service Tax paid on their inputs acquired for use in taxable activities.

Value Added Tax

The application of Value Added Tax (VAT) is under the purview of the State Government and is levied on the sale or purchase of goods within the state. At present, in most states minerals are liable for a VAT at the rate of 4% and 20%. However, precious metals like gold and silver are taxed at the reduced rate of 1%. Since the mine output is subject to VAT, miners are allowed to claim a refund of VAT paid on their inputs. The VAT cost flows from the mining company to the manufacturer and then to the distributor and reseller.

4.4 Mining Levies

Royalty

Royalty on mining is collected by the State Government. In the case of Union Territories, the same is charged by the Central Government. Since August 2009, only 9 minerals (chrysotile, dolomite, limestone including lime kankar, lime shell, monazite, ochre and for stowing, slate and tungsten) are being charged royalty on 'units of production' basis. Royalty on all the remaining minerals is on ad valorem basis as percentage of price notified by the government.

The rates of royalty are notified by the Central Government (in case of major minerals) or the State Government (in case of minor minerals) and vary from mineral to mineral and may be enhanced or reduced. Any enhancement, however, can be done only once in three years.

Dead Rent (if applicable)

In the event that a mine is temporarily closed, the lessee is required to pay dead rent. The rates can be enhanced once in three years. A lessee is liable to pay royalty or dead rent whichever is higher and not both.

Contribution to National Mineral Exploration Trust

The MMDR Amendment Act, 2015 envisages the establishment of the National Mineral Exploration Trust (NMET) with an objective of regional

and detailed exploration. As per the Act, the holder of ML or CL is required to pay a sum equal to two percent of the royalty as a contribution to the Trust. The contributions received by the NMET will be used for exploration activities.

Contribution to District Mineral Foundation

The MMDR Amendment Act, 2015 envisages the establishment of the District Mineral Foundation in all districts affected by mining related operations and contribution received are utilised for local area development and to promote sustainable development in mining and exploration.

A concessionaire holding an ML or CL granted on or after the date of commencement of the MMDR Amendment Act, 2015, is required to contribute a particular amount to the DMF, besides the royalty payable. The amount of contribution shall not exceed one-third of the royalty prescribed by the Central Government.

Surface Rent (if applicable)

A lessee may be liable to pay surface rent at the rate specified by the State Government. However, surface rent may not be applicable in case the land is owned by the State Government. For access to surface right of the private land, lessee may have to pay to surface rent to the private owner.

Application Fee

Application fee may be applicable in certain instances. For e.g. an amount of Rs. 1,000 per sq. km. is the application fee payable for Non-Exclusive Reconnaissance Permit.

4.5 Other Levies

In addition to the levies under the MMDR Act and the general taxes listed above, the concessionaire may be required to pay certain other levies and taxes during the course of mining operations depending on specific situations.

- **Entry Tax** – Levied on entry of the scheduled goods into a local area for consumption, use or sale therein at such rate not exceeding twelve percent of the purchase value of such goods from such date as may be specified by the State Government. The liability to pay Sales Tax gets reduced by the amount of Entry Tax paid.
- **Forest Tax** – Levied on forest produce removed from forest areas.
- **Compensatory Afforestation Charges** – Levied to promote afforestation and compensate for deforestation and loss to flora in the leased forest area.
- **Net Present Value of Forest Land Diverted for Mining** – Levied on the part of land that has been diverted for the purpose of carrying out exploration or mining operations. The value depends on the density of the forest.
- **Stamp Duty** – Tax levied on documents as per provisions of the Indian Stamp Act, 1899 and the rules framed thereunder.
- **Water Tax** – Charged as per the powers granted under Article 246 and 262 of the Indian Constitution.
- Cess is levied on mineral ore under various legislations. For instance, cess on iron ore, manganese ore and chrome ore are levied under the Iron Ore Mines, Manganese Ore Mines and Chrome Ore Mines Labour Welfare Cess Act, 1976.

4.6 Incentives

Where mining is carried out in a Special Economic Zone (SEZ) and the mined minerals are exported, the mining company is eligible for tax holiday for certain number of years subject to fulfilment of certain conditions. Special deduction on prospecting of minerals under Income Tax is available to them.

Appendix

Classification of Minerals in India

Major Minerals

Minerals under the First Schedule of the MMDR Act, 1957

PART A. Hydro Carbons Energy Minerals

1. Coal and Lignite

PART B. Atomic Minerals

- | | |
|---|--|
| 1. Beryl and other beryllium-bearing minerals | 7. Titanium bearing minerals and ores (ilmenite, rutile and leucoxene) |
| 2. Lithium-bearing minerals | 8. Tantalum-bearing minerals |
| 3. Minerals of the “rare earths” group containing Uranium and Thorium | 9. Uraniferous allanite, monazite and other thorium minerals |
| 4. Niobium-bearing minerals | 10. Uranium bearing tailings left over from ores after extraction of copper and gold, ilmenite and other titanium ores |
| 5. Phosphorites and other phosphatic ores containing Uranium | 11. Zirconium bearing minerals and ores including zircon |
| 6. Pitchblende and other Uranium ores | |

PART C. Metallic and Non-Metallic Minerals

- | | |
|---------------|-------------------------------------|
| 1. Asbestos | 5. Lead |
| 2. Chrome Ore | 6. Precious stones (Diamond, Ruby) |
| 3. Copper ore | 7. Zinc |
| 4. Gold | |

Metallic and Non-Metallic Minerals under the Second Schedule of the MMDR Act, 1957

- | | |
|-----------------------------|---------------------------|
| 8. Apatite & Rock Phosphate | 19. Wollastonite |
| 9. Garnet | 20. Cadmium |
| 10. Graphite | 21. Columbite – Tantalite |
| 11. Kyanite | 22. Nickel |
| 12. Limestone | 23. Perlite |
| 13. Lime shell | 24. Pyrite |
| 14. Magnesite | 25. Rock Salt |
| 15. Selenite | 26. Silver |
| 16. Sillimanite | 27. Tungsten |
| 17. Tin | 28. Vanadium |
| 18. Vermiculite | |

Notified Minerals under the Fourth Schedule of the MMDR Act, 1957

- | | |
|--------------|-------------------|
| 29. Bauxite | 31. Limestone |
| 30. Iron ore | 32. Manganese ore |

Minor Minerals

Rule 70 of Mineral Concession Rules

- | | |
|-------------------|--|
| 1. Building Stone | 4. Ordinary sand other than sand used for prescribed purpose |
| 2. Gravel | i. purposes of refractory and manufacture of ceramic |
| | ii. metallurgical purposes |
| 3. Ordinary clay | iii. for manufacture of silvicate cement |
| | iv. optical purposes |
| | v. purposes of stowing in coal mines |
| | vi. for manufacture of sodium silicate |
| | vii. for manufacture of sodium silicate |

Notification No General Statutory Rule GSR 436 dated 01.06.1958

- | | |
|--|---|
| 5. Boulder | 10. Brick-earth |
| 6. Shingle | 11. Fuller's earth |
| 7. Chalcedony pebbles used for ball mill purposes only | 12. Bentonite |
| 8. Limeshell, kankar and limestone
(used in kilns for manufacture of lime used as building material Notification No M.II-169(40)/58 dated 20.09.1961) | 13. Road metal |
| 9. Murrum | 14. Reh-matti |
| | 15. Slate and shale when used for building material |

Notification No GSR 1041 dated 03.09.1959

16. Marble

Notification No GSR 341 dated 25.02.1965

- | | |
|--|--|
| 17. Stone used for making household Utensils | 18. Quartzite and sandstone when used for purposes of building or for making road metal and household utensils |
|--|--|

Notification No GSR 124 dated 28.01.1967

19. Saltpetre

Notification No GSR 95 E dated 03.02.2000

20. Ordinary earth (used or filling or levelling purposes in construction or embankments, roads, railways, building)

Notification No GSR 333 dated 10.02.2015

- | | |
|--------------------------|-----------------------------------|
| 21. Agate | 37. Gypsum |
| 22. Ball clay | 38. Jasper |
| 23. Barytes | 39. Kaolin |
| 24. Calcareous Sand | 40. Laterite |
| 25. Calcite | 41. Limekankar |
| 26. Chalk | 42. Mica |
| 27. China clay | 43. Ochre |
| 28. Clay (Others) | 44. Pyrophyllite |
| 29. Corundum | 45. Quartz |
| 30. Diaspore | 46. Quartzite |
| 31. Dolomite | 47. Sand (Others) |
| 32. Dunite or Pyroxenite | 48. Shale |
| 33. Felsite | 49. Silica Sand |
| 34. Felspar | 50. Slate |
| 35. Fireclay | 51. Steatite or Talc or Soapstone |
| 36. Fuschite – Quartzite | |

Geology of Indian Subcontinent

Indian sub-continent has a land area of 3.2875 million sq. km. of which about 74% is constituted of hard rock while the remaining 26% lies under a thick alluvial cover. As a part of the ancient super continent Gondwanaland, geologically India is akin to the mineral rich counterpart continents Australia, Africa and South America and hence holds immense potential for natural resources. The country can be divided into three well marked regions from south to north each having a distinct lithological and tectonic setting.

Peninsular India

The first is the Peninsular or Peninsular Shield ('Shield' being a term used for geologically very old and stable parts of the crust) lying to the south of the plains of the Indus and Ganges river systems. It has Precambrian (Archaean – Proterozoic) shield area, restrictively overlain by the Gondwana, Deccan Trap and Tertiary to Recent Sedimentary Formations.

Indo-Gangetic Alluvial Tract

The second division comprises these Indo-Gangetic alluvial plains stretching across northern India from Assam and Bengal on the east, through Bihar and Uttar Pradesh, to the Punjab on the west. It has Neogene-Quaternary sediments lying between the Peninsular areas and the Himalayas.

Extra-Peninsula

The third is the Extra-Peninsula, the mountainous region formed of the mighty Himalayan ranges, is divided into four litho-morphotectonic belts from south to north namely, (i) Foothill belt (Sub-Himalayas), (ii) Main Himalayan belt (Lesser Himalayas), (iii) Indus-Shyok belt (Great Himalayas) and (iv) Karakoram belt (Tethys Himalayas), extending over 2500 km. It has Precambrian shield elements and a thick sequence of Phanerozoic rocks.

Geological Setting of Peninsular Region

The spatial distribution of these Precambrian rocks segments is restricted in the five cratonic areas, known as Dharwar craton, Aravalli craton, Singhbhum craton, Bastar craton and Bundelkhand craton. These cratonic areas are skirted by Proterozoic mobile belts, along which the cratons have coalesced to form a composite land-mass of the Indian Peninsular shield area.

The **Dharwar Craton**, situated in southern part of India, comprises mostly of Peninsular Gneiss basement rock of tonalite-trondhjemite-granodiorite (TTC) composition and granite-greenstone terrain in the north and the Proterozoic Southern Granulite Terrain in the south with the Palghat-Cauvery shear zone marking their contact. The Dharwar craton is bounded in the northeast by the Eastern Ghat Mobile Belt (EGMB). It is a granulite terrain made up of charnockite, khondalite, quartzite, calc-granulite, pyroxene granulite and leptynites.

The **Singhbhum Craton**, situated in eastern part of India, is the richest mineralized cratonic block in India. It comprises Archaean nucleus of South Singhbhum, Proterozoic Dalma volcanic belt and Chotanagpur Gneissic Complex (CGC).

Central Indian Precambrian Shield is a mosaic of two crustal provinces the **Bastar Craton** and **Bundelkhand Craton** separated by a prominent east-west trending Central Indian Shear (CIS) or Central Indian Tectonic Zone (CITZ). The cratonic components of Bastar includes Basement Gneiss, Sukma metamorphic suite, Bengpal Group, Bailadilla group, undifferentiated granites and basic dykes. The Bundelkhand Craton includes gneiss-supracrustal-granite litho associations of Mahakoshal, Sausar and Betul-Chindwara belts and the granulites in Sausar terrain, Bundelkhand gneiss-granitoid terrain and the cover sequences

of Vindhyan and Bijawar Supergroup. The Precambrian of the Western Indian Shield comprises the Banded Gneissic Complex (BGC) and the Aravalli-Delhi mobile belts with Trans-Aravalli basins.

During the Palaeoproterozoic to Neoproterozoic period Peninsular India witnessed the development of a number of large intracratonic / pericratonic platformal sedimentary basins referred to as the Purana basins. The basins to the south of the Son-Narmada-Tapti (SONATA) lineament - Cuddapah, Kaladgi-Bhima, Pakhal, Indravati, Abujhmar and Chhattisgarh occur as isolated basins and the sediments to the north form the continuous Vindhyan Basin. The Phanerozoic rocks in India, other than Deccan trap, are mainly developed in the Gondwana basins and the western Indian shelf and coastal areas. It occurs within the suture zones of Precambrian cratonic blocks of Peninsular India and are exposed along three major rift valleys, Godavari, Mahanadi and Damodar.

The Deccan Trap of Upper Cretaceous to Eocene age, however, covers a large area (0.6 million sq. km.) of the Peninsular India and are extensive sheets of horizontally bedded lavas of tholeiitic flood basalts. Mesozoic, Tertiary and quaternary sediments occur at places. Achaean-Proterozoic sequence is by far the most important hosts for occurrence of metallic deposits. In addition, igneous, metamorphic and a few sedimentary rocks also form a variety of dimensional stones for which large domestic market as well as export

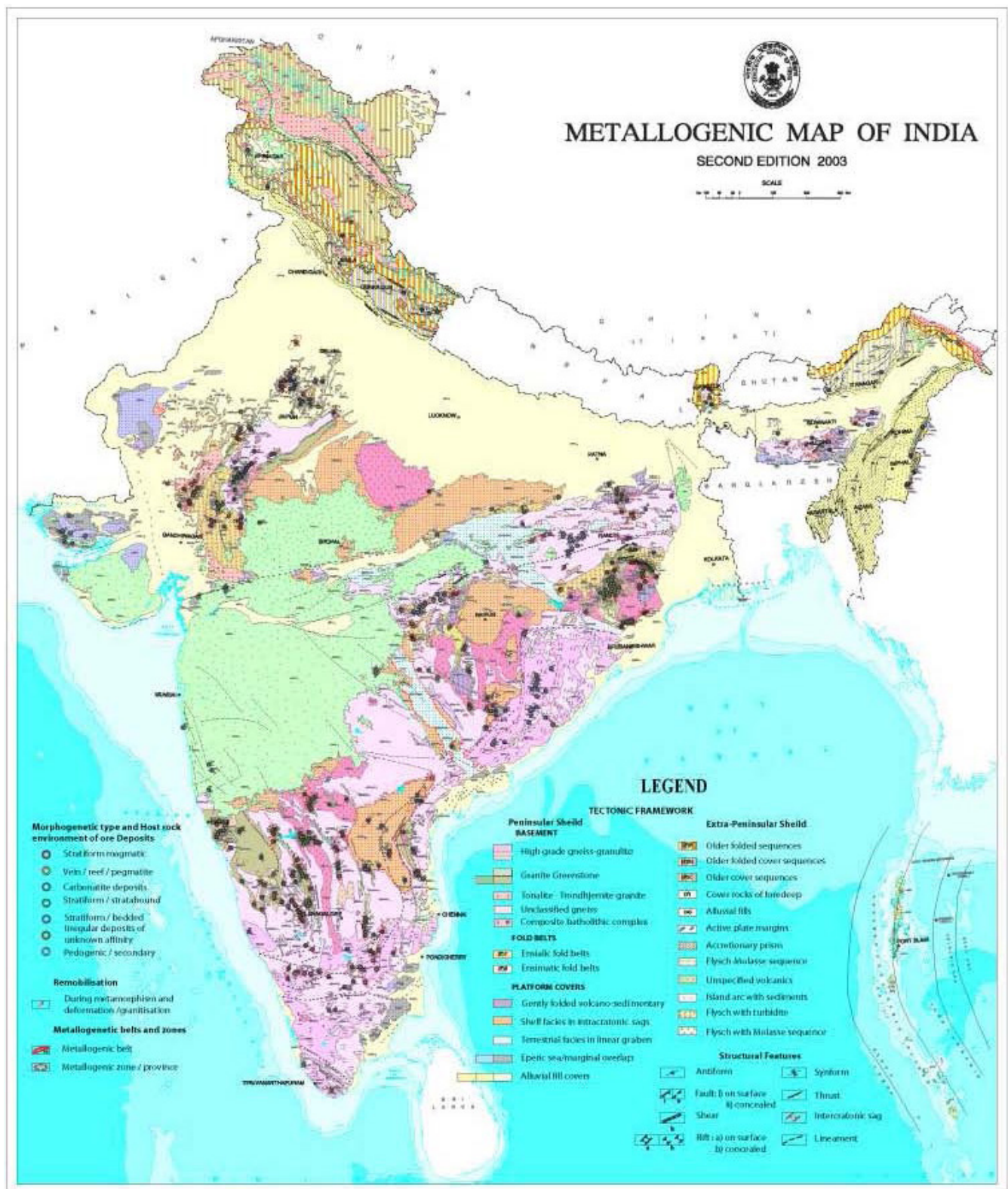
potential exists. The major part of multi-coloured dimensional stones is restricted to the Precambrian terrain.

Geology of Extra-peninsular Area

The Himalayan mountain chain emerged during the Tertiary. The foothill Himalaya is a 10 – 50 km wide Miocene to Recent Molasse sequence represented by Siwalik, Murree and Subathu Group of rocks. This is followed to the north by the Lesser and Higher Himalaya, represented by geological sequence of Proterozoic age with Phanerozoic cover. The foothill Himalaya is separated from the Lesser Himalaya by the north-dipping Main Boundary Fault (MBF) or the Main Boundary Thrust (MBT). Main Frontal Thrust (MFT) limits the margins of the Siwalik Zone against the Ganga Plains to the south.

The metallogeny of the most impressive Himalayan mountain range is not fully well studied. The Himalaya deserves a thorough scanning for possible but varied metallogeny ranging from sedimentary-digenetic types in the Frontal belt, SEDEX type and hydrothermal deposits in Lesser Himalaya, Tertiary granitic pluton related metalization in Central crystalline, bedded deposits in Tethyan sediments, ophiolite related metallization along Indus-Tsangpo suture zone and porphyry type deposits in Trans-Himalayan region. There are many prominent hydrothermal alteration zones with or without mineral shows which may also lead to metal concentration in deeper levels.

Metallogenic Map of India



Mineral Provinces

State-wise Details of Mineral Belts/Terrains within the OGP Areas

Name of state	OGP area (sq. km.)	Geological Terrain	Major Mineral Commodities
Andhra Pradesh & Telangana	1,31,500	Granite-gneissic terrain & layered complex of A.P., Greenstone belts, EGMB, Cuddapah basin & Pranhita-Godavari valley coal field	Gold, Diamond, Base Metal, PGE, Iron-ore, Manganese, Bauxite, Limestone, Coal
Karnataka	80,000	Granite-greenstone terrain & layered complex, Greenstone belt & Western Ghat	Gold, Diamond, Base Metal, PGE, Bauxite, Iron-ore, Manganese, Chromite, Limestone
Tamil Nadu	17,300	Harur-Uttangarai belt, Greenstone belt, Granulite belt, Sittapundi complex, Attur-Satyamangalam belt, Neyveli & Mannargudi lignite field	Gold, Base Metal, PGE, Iron-ore, Bauxite, Chromite, Molybdenum, Lignite
Kerala	6,000	Nilambur-Attapadi belt, Western Ghat	Gold, Bauxite, PGE
Maharashtra	28,100	Sakoli fold belt, Sausar belt, Wairagarh belt, Satpura basin	Gold, Base Metal, Diamond, Manganese, Bauxite, PGE, Coal, Iron-ore
Madhya Pradesh	31,300	Mahakoshal fold belt, Betul belt, Aravalli fold belt, Bundelkhand granitoid province, Vindhya, Bauxite belt of Amarkantak. Satpura, Son-Mahanadi & Narmada basin	Gold, Base Metal, Diamond, Limestone, Bauxite, PGE, Coal
Chhattisgarh	57,250	Sonakhan, Bailadila-Rowghat belt, Bauxite belt of Phutka pahar, Satpura, Son-Mahanadi & Narmada basin	Gold, Diamond, Iron-ore, Bauxite, Limestone, Coal
Orissa	47,025	Baula-Nuasahi belt, Gangpur belt, Bonai-Noamundi belt, Garumahisani belt, Eastern Ghat Mobile belt, Part of Bastar craton, Son-Mahanadi coal basin	Gold, Diamond, Base Metal, Iron-ore, Manganese, Chromite, PGE, Bauxite, Coal

Name of state	OGP area (sq. km.)	Geological Terrain	Major Mineral Commodities
Jharkhand & Bihar	23,550	Singbhun-Gangpur fold belt, Ranchi plateau, Chhotanagpur gneissic complex, Rpro- Jojohatu belt, Son-Mahanadi valley coal basin.	Gold, Base Metal, Bauxite, Manganese, Chromite, PGE, Iron-ore, Mica, Coal
West Bengal	5,240	Singhbhum-Gangpur-Purulia fold belt, Daling Group, Damodar - Koel & Rajmahal coal basin	Gold, Base Metal, Coal
Gujarat	25,100	Aravalli fold belt, South Delhi fold belt, Cambay & Kalol basin	Gold, Base Metal, Bauxite, Limestone, Lignite
Rajasthan	1,02,000	Bhilwara Supergroup, Aravalli & Delhi fold belt, Sanchor lignite basin	Gold, Tungsten, Tin, Base Metal, Limestone, Lignite
Uttar Pradesh & Uttarakhand	9,100	Mahakoshal fold belt, Bundelkhand Granitoid province, Vindhya	Base Metal, Diamond, Gold
Haryana	1,300	North Delhi fold belt, Tosham belt	Base Metal, Tin, Tungsten
Meghalaya	2,510	Shillong Plateau, Mikir Hills, Singrimari coal basin	Limestone, Base Metal, PGE, Iron-ore, Coal
Assam	940	Karbi Anglong domain, Singrimari coal basin	Base Metal, Iron-ore, Coal
Sikkim	1,000	Daling Group	Base Metal
Goa	1,500	Green stone belt	Iron, Manganese, Bauxite, Gold
Total	5,70,715		

Source: Geological Survey of India

State-wise and Mineral-wise Details within the OGP Areas

(square kilometres)

No.	Mineral State	State OGP	Gold	Diamond & Precious Stones	Base Metal	Platinum Group of Elements	Iron Ore	Manganese	Chromite	Molybdenum	Coal & Lignite	Tin & Tungsten	Bauxite
1	Andhra Pradesh	131,500	3,000	117,000	33,000	300	400	500	-	-	11,000	-	6,000
2	Rajasthan	102,000	25,000		85,350	-	-	-	-	-	16,000	-	-
3	Karnataka	80,000	35,000	62,000	2,000	4,000	2,130	1,360	360	-	-	-	300
4	Chhattisgarh	57,250	2,800	45,000			205			-	7,450		350
5	Odisha	47,025	8,680	29,000	4,800	1,400	700	1,110	1,400	-	1,725		19,000
6	Madhya Pradesh	31,300	5,650	18,400	9,000	-	-	-	-	-	5,600	-	350
7	Maharashtra	28,100	5,500	18,000	5,500	1,000		430	-	-	3,100	-	750
8	Gujarat	25,100	5,500		18,300					-	5,800		1,000
9	Jharkhand & Bihar	23,550	11,180	-	12,120	430	300	600	430	-	3,350	-	250
10	Tamil Nadu	17,300	1,000	3,000	1,500	1,000	800		500	6,000	3,300	-	200
11	Uttar Pradesh	9,100	4,500	5,600	4,500	-	-	-	-	-	-	-	-
12	Kerala	6,000	1,000	2,000	-	-	-	-	-	-	-	-	3,000
13	West Bengal	5,240	2,580		3,330	-	-	-	-	-	1,940	-	
14	Meghalaya	2,510	-	-		-	-	-	-	-	760	-	-
15	Goa	1,500	1,500				600	600	-	-	-	-	1,050
16	Haryana	1,300	-	-	-	-	-	-	-	-	-	1,300	-
17	Sikkim	1,000			1,000	-	-	-	-	-	-	-	-
18	Assam	940	-	-	750	-	-	-	-	-	190	-	-
	Total Area	570,715	112,890	300,000	181,150	8,130	5,135	4,600	2,690	6,000	60,215	1,300	32,250

Source: Geological Survey of India

Mineral-wise Reserves and Resources

[as on April 1, 2010 and April 1, 2013 (Projected)]

No.	Mineral	Unit	Reserves	Remaining Resources	Total Resources
1	Alexandrite	–	N. E.	N. E.	N. E.
2	Andalusite	000' tonnes	–	18,450	18,450
3	Antimony (P)	tonnes			
	Ore		–	10,588	10,588
	Metal		–	174	174
4	Apatite (P)	tonnes	30,792	22,630,348	22,661,140
5	Asbestos	tonnes	2,510,841	19,655,762	22,166,603
6	Ball Clay	tonnes	16,777,842	66,615,662	83,393,504
7	Barytes	tonnes	31,584,128	41,149,746	72,733,874
8	Bauxite	000' tonnes	592,938	2,886,682	3,479,620
9	Bentonite	tonnes	25,060,508	543,306,838	568,367,346
10	Borax	tonnes	–	74,204	74,204
11	Calcite	tonnes	2,664,338	18,281,110	20,945,448
12	Chalk	000' tonnes	4,332	585	4,917
13	China Clay	000' tonnes	177,158	2,528,049	2,705,207
14	Chromite (P)	000' tonnes	107,221	214,530	321,751
15	Cobalt Ore (P)	MT	–	45	45
16	Copper (P)	000' tonnes			
	Ore		237,573	1,273,445	1,511,018
	Metal		2,997	9,222	12,219
17	Corundum (P)	tonnes	597	267,218	267,815
18	Diamond (P)	carats	984,875	30,876,432	31,861,307
19	Diaspore	tonnes	2,859,674	3,125,144	5,984,818
20	Diatomite	000' tonnes	–	2,885	2,885
21	Dolomite	000' tonnes	738,185	6,992,372	7,730,557
22	Dunite	000' tonnes	17,137	168,232	185,369
23	Emerald	–	N. E.	N. E.	N. E.
24	Feldspar	tonnes	44,503,240	87,832,212	132,335,452
25	Fire Clay	000' tonnes	30,104	683,415	713,519
26	Fluorite (P)	tonnes	4,574,118	13,614,193	18,188,311
27	Fullers Earth	tonnes	58,200	256,593,879	256,652,079
28	Garnet	tonnes	19,324,793	37,638,032	56,962,824

No.	Mineral	Unit	Reserves	Remaining Resources	Total Resources
29	Gold (P)	tonnes			
	Ore (Primary)		14,615,965	480,188,061	494,804,026
	Metal (Primary)		72	569	640
	Ore (Placer)		–	26,121,000	26,121,000
	Metal (Placer)		–	6	6
30	Granite (Dimension Stone)	000' cubic metre	263,692	45,966,608	46,230,300
31	Graphite	tonnes	8,031,864	166,817,781	174,849,645
32	Gypsum	000' tonnes	39,096	1,247,402	1,286,498
33	Iron Ore (P) Haematite	000' tonnes	6,608,287	13,967,420	20,575,707
34	Iron Ore (P) Magnetite	000' tonnes	34,592	10,712,763	10,747,355
35	Kyanite	tonnes	1,574,853	101,670,767	103,245,620
36	Laterite (P)	000' tonnes	58,151	477,309	535,460
37	Lead and Zinc (P)	000' tonnes			
	Lead and Zinc Ore		102,795	606,248	709,043
	Metal Lead		2,115	9,889	12,004
	Zinc		10,893	24,963	35,856
	Lead + Zinc		–	141	141
38	Limestone	000' tonnes	14,926,392	170,008,720	184,935,112
39	Magnesite (P)	000' tonnes	20,782	307,339	328,121
40	Manganese Ore	000' tonnes	141,977	288,003	429,980
41	Marble	000' tonnes	276,495	1,654,968	1,931,463
42	Marl	tonnes	139,976,150	11,704,870	151,681,020
43	Mica	kilogram	190,741,448	341,495,531	532,236,979
44	Molybdenum (P)	tonnes			
	Ore		–	19,371,698	19,371,698
	Contained MOS ₂		–	12,668	12,668
45	Nickel Ore (P)	MT	–	189	189
46	Ochre	tonnes	54,942,176	89,319,089	144,261,265
47	Perlite	000' tonnes	428	1,978	2,406
48	PGM (Metal)	tonnes of metal content	–	16	16
49	Potash	MT	–	21,816	21,816
50	Pyrite	000' tonnes	–	1,674,401	1,674,401
51	Pyrophyllite	tonnes	23,275,451	32,807,451	56,082,902
52	Quartz/ Silica Sand	000' tonnes	429,223	3,069,808	3,499,031
53	Quartzite	000' tonnes	86,599	1,164,649	1,251,248

No.	Mineral	Unit	Reserves	Remaining Resources	Total Resources
54	Rock Phosphate (P)	tonnes	65,391,551	249,119,998	314,511,549
55	Rock Salt	000' tonnes	16,026	–	16,026
56	Ruby	kilogram	236	5,112	5,348
57	Sapphire	kilogram	–	450	450
58	Shale	000' tonnes	15,331	580	15,911
59	Sillimanite	tonnes	4,085,052	62,902,385	66,987,437
60	Silver (P)	tonnes			
	Ore		118,281,065	401,288,894	519,569,959
	Metal		7,908	21,880	29,788
61	Slate	000' tonnes	–	2,369	2,369
62	Sulphur (Native)	000' tonnes	–	210	210
63	Talc/Steatite/ Soapst	000' tonnes	90,026	178,996	269,022
64	Tin (P)	tonnes			
	Ore		6,973	83,719,193	83,726,166
	Metal		1,181	101,094	102,275
65	Titanium minerals	tonnes	22,030,223	371,965,694	393,995,917
66	Tungsten (P)	tonnes			
	Ore		–	87,387,464	87,387,464
	Contained WO ₃		–	142,094	142,094
67	Vanadium (P)	tonnes			
	Ore		–	24,633,855	24,633,855
	Contained V ₂ O ₅		–	64,594	64,594
68	Vermiculite	tonnes	1,704,007	803,003	2,507,010
69	Wollastonite	tonnes	2,487,122	14,082,751	16,569,873
70	Zircon	tonnes	1,347,470	1,786,482	3,133,952

Source: Indian Bureau of Mines

N. E. : Not Estimated

(P) : Provisional as on 01.04.2013

Information for the Investors

Geological Survey of India and Indian Bureau of Mines could provide the following information to the potential investors.

- Geological Map of India (1:2M, 1:5M and 1:50000)
- Mineral Atlas of India (1:2M, 77 maps sheets)
- Mineral Belt Map (1:50,000)
- Tectonic Map (1:2M, 1:7.5M)
- Sea Bed Sediment Maps (1:0.5M)
- Geological and Mineral Maps of states
- District Resource Maps
- Seismo-tectonic Atlas of India
- Compilation and digitization of ~5,000 maps on 1:50,000 scales in advanced stage
- Derivative map from Aero-geophysical Survey Remote Sensing study
- Indian Mineral Year Book

Detailed Information Dossier (DID)

For Gold, Diamond, Bauxite, Iron ores, Manganese, Molybdenum, Chromite, Tungsten and Copper-lead-zinc (Basic data on mineral provinces, belts, occurrences and known deposits)

- More than 1,500 Publications
- More than 45,000 unpublished professional reports available in soft copies

Important Websites and Links

Website/Act/Rule	URL
Ministry of Mines website	http://www.mines.gov.in
National Mineral Policy	http://mines.gov.in/writereaddata/Content/88753b05_NMP2008[1].pdf
Mines and Minerals (Development & Regulation) Act, 1957	http://egazette.nic.in/writereaddata/1957/E-2142-1957-0052-97089.pdf ; http://ibm.nic.in/writereaddata/files/07102014115602MMDR%20Act%201957_10052012.pdf
The Mines and Minerals (Development and Regulation) Amendment Act, 2015	http://www.mines.gov.in/writereaddata/UploadFile/The_Mines-and-Minerals_Amendment_Act,2015.pdf
Mineral Concession Rules, 1960	http://mines.gov.in/writereaddata/UploadFile/Mineral%20Concession%20Rule,%201960.pdf
Mineral Conservation & Development Rules, 1988	http://mines.gov.in/writereaddata/UploadFile/Mineral%20Conservation%20and%20Development%20Rules,%201988.pdf
Mineral (Auction) Rules, 2015	http://mines.gov.in/writereaddata/UploadFile/Mineral%20(Auction)%20Rules,%202015.pdf
The Minerals (Evidence of Mineral Contents) Rules, 2015	http://www.mines.gov.in/writereaddata/UploadFile/Minerals(EvidenceofMineralContents)Rules_2015.pdf
The Mineral (Non-exclusive Reconnaissance Permit) Rules, 2015	http://www.mines.gov.in/writereaddata/UploadFile/1.pdf
The Mines Act, 1952	http://www.dgms.net/ma_1952.pdf , http://india.gov.in/mines-act-1952
The Mines Rules, 1955	http://www.dgms.net/mr.pdf
The Offshore Areas Mineral (Development and Regulation) Act, 2002	http://mines.gov.in/writereaddata/UploadFile/Offshore_Areas_Mineral_Development_Regulation_Act_2002.pdf
The Offshore Areas Mineral Concession Rules, 2006	http://mines.gov.in/writereaddata/UploadFile/Offshore%20Areas%20Mineral%20Concession%20Rules,%202006.pdf
Atomic Minerals Act	http://dae.nic.in/?q=node/153
Geological Survey of India	http://portal.gsi.gov.in
Income Tax website	http://www.incometaxindia.gov.in/Pages/default.aspx
Service Tax website	http://www.servicetax.gov.in/

Indian Bureau of Mines	http://ibm.nic.in/
Mineral Exploration Corporation Limited	http://www.mecl.gov.in/
Survey of India	http://www.surveyofindia.gov.in/
State Directorates of Geology & Mining	
Department of Mines and Geology, Andhra Pradesh	http://web-grafix.in/apmines/
Department of Mines & Geology, Bihar	http://mines.bih.nic.in/
Directorate of Geology and Mining, Mineral Resources Department, Chhattisgarh	http://chhattisgarhmines.gov.in/
Department of Mines & Geology, Goa	http://www.goadmg.gov.in/
Commissioner of Geology & Mining, Industry & Mines Department, Gujarat	http://www.geomining.gujarat.gov.in/
Department of Mines & Geology, Jharkhand	http://www.jharkhand.gov.in/mines-geology
Department of Mines and Geology, Karnataka	http://mines.kar.nic.in/
Directorate of Geology and Mines, Mineral Resources Department, Madhya Pradesh	http://www.mineralresources.mp.gov.in/home
Directorate of Geology and Mines, Maharashtra	http://www.mahadgm.gov.in/Index.aspx
Directorate of Geology and Mines, Steel & Mines Department, Odisha	http://www.orissaminerals.gov.in/Website/default-new.aspx
Directorate of Geology and Mines, Rajasthan	http://www.dmg-raj.org/
Department of Geology and Mining, Tamil Nadu	http://www.tnmine.tn.nic.in/
Directorate of Geology and Mining, Uttar Pradesh	http://mineral.up.nic.in/
Directorate of Mines and Minerals, West Bengal	http://www.dmm.gov.in/