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(Part- I : General Reviews)

54th Edition

INDIAN MINERAL INDUSTRY & NATIONAL ECONOMY

(FINAL RELEASE)

GOVERNMENT OF INDIA
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NATIONAL ECONOMY

Despite Global headwinds and a truant monsoon, India registered robust growth of 7.2% in 2014-15 and 7.6% in 2015-16, thus becoming the fastest growing major economy in the world. Additionally, its other macroeconomic parameters like inflation, fiscal deficit and current account balance have exhibited distinct signs of improvement. As per the estimates of the International Monetary Fund (IMF), global growth averaged 3.1% in 2015, declining from 3.4% registered in 2014. While growth in advanced economies has improved modestly since 2013, the emerging economies have witnessed a consistently declining trend in growth rate since 2010. It is against this background that the recent Indian growth story appears particularly bright.

Gross Domestic Product (GDP) is a key indicator by which a nation's economic performance is gauged. Economic growth, measured by growth in gross domestic product (GDP) at 2011-12 prices was estimated at 7.6% in 2015-16 as against 6.6% in 2013-14 and 7.2% in 2014-15. India's share in world GDP has increased from an average of 4.8% during 2001-07 to 6.1% during 2008-13 and further to an average of 7.0% during 2014 to 2015 in current Purchasing Power Parity (PPP) terms (IMF). India's resilience and current levels of reasonably strong growth should, thus, be appreciated in the light of its increasing contribution to global growth.

Economic policies bring about pronounced changes in the industrial climate, foreign trade, domestic and international taxation policies, monetary exchange rates, etc., that have far reaching effects on the overall growth of an economy. As per advance estimates in India's Economic Survey 2015-16, GVA growth rate at Basic Price (2011-12 prices) touched 7.3% in 2015-16 as against 6.3% in 2013-14 and 7.1% in 2014-15.

Economic parameters as per advance estimates published in Economic Survey 2015-16 reveal that the GDP in 2015-16 at constant market prices and GVA at Basic Price (2011-12 prices) were ₹1,13,50,962 crore and ₹1,04,37,579 crore, respectively.

Growth in the Agriculture Sector in 2015-16 has continued to be lower than the average of last decade, mainly on account of it being the second successive year of lower-than-normal monsoon rains. The growth rates in agriculture have been fluctuating from 1.5% in 2012-13, 4.2% in 2013-14 to (-) 0.2% in 2014-15, however, in 2015-16 the growth is likely to be 1.1%. Growth in the Services Sector moderated slightly, but still remains robust; while the acceleration in the growth of the Manufacturing Sector compensated for it. Growth in Industry is estimated to have accelerated during the current year on the strength of improvement in the manufacturing activity. As per the data on RE of national income, the growth of the Industrial Sector comprising mining and quarrying, manufacturing, electricity, gas, water supply and other utility services, and construction is 5.9% during 2014-15, as against 5.0% during 2013-14. The growth is expected to strengthen furher to 7.3% for 2015-16 as per the AE released by the CSO, recently. Within the Industrial Sector, Manufacturing is expected to register a growth of 9.5%. The Index of Industrial Production (IIP) showed that the production in the Manufacturing Sector grew by 3.1% during April-December 2015-16, vis-a-vis a growth of 1.8% in the corresponding period of the previous year. The ongoing manufacturing recovery in the current year is aided by robust growth in petroleum refining, automobiles, wearing apparels, chemicals, electrical machinery and wood products of furniture. Apart from Manufacturing, the other three segments of the Industry Sector, i.e, electricity, gas,water supply and related utilities, mining & quarrying and construction activities, are witnessing a deceleration in growth.

The eight core Infrastructure-supportive Industries coal, crude oil, natural gas, refinery products, fertilizers, steel, cement and electricity - that have a total weight of nearly 38% in the IIP registered a cumulative growth of 1.9% during April-December 2015-16 as compared to 5.7% during April-December, 2014-15. Month-wise performance of the eight core sector showed that the production of coal and fertilizer increased substantially, while that of crude oil, natural gas and steel mostly declined. Refinery products, cement and electricity attained moderate growth.

India's merchandise trade

After reaching unsustainably high levels, trade and current account deficits moderated on import restrictions in 2013-14 and continued so in 2014-15. It might be recalled that the restrictions on import of gold and 80:20 import rule were withdrawn in mid-year 2014-15 and the continuance of robust outcome in 2015-16 indicates that the external sector position is sustainable. Such an outcome in times of continued low growth in trade volumes and weak global prospects is significant. India's merchandise exports have been declining continuously since December 2014, which is in line with the performance of export growth in different countries. During the current financial year (April-January 2015-16), India's exports declined year-on-year by 17.6% to US $ 217.7 billion and this decline was broad-based. The cause of decline in India's exports could be owed to sluggish global demand and low global commodity prices, particularly petroleum.

In keeping with the global trends of slow growth, imports have declined by 15.5% in 2015-16 (April-January) to US $ 324.5 billion. Lower imports of petroleum, oil and lubricants (POL) were the main reason for the decline in total imports this year so far. POL imports declined by 41.4% to US $ 73.1 billion in 2015-16 (April-January) as against US $ 124.8 billion in 2014-15 (April-January), as a result of steep fall in international crude oil prices. Moderation in trade deficit in 2014-15 was due to decline in the value of POL imports by 16.0% caused by fall in international oil price by 20.2% in 2014-15. The moderation continues through in 2015-16 with further decline in global crude oil prices, with trade deficit in 2015-16 (April-January) placed at US $ 106.8 billion.

The composition and direction of trade are undergoing changes and the sectors that are resilient are accounting for higher proportions in the total trade and also were responsible for change in trade direction. During 2015-16 (April-December), there was a broad-based decline in exports to Europe, America, Africa, Asia and the CIS. Imports from all five regions declined, with the highest decline of 21.5% in imports from America in 2015-16 (April-December). India's imports from China registered a growth of 2.5% in April-December, 2015-16 while imports from other major countries registered a negative growth rates.

Trade deficit (on BoP basis) declined from US $ 74.7 billion in 2014-15 (April-September) to US $ 71.6 billion in 2015-16 (April-September). The surplus of net invisibles increased by around US $ 1 billion to US $57.2 billion in the first half of 2015-16. Moderate growth in invisibles coupled with lower trade deficit, resulted in a lower CAD of US $ 26.8 billion (1.3% of GDP) in 2014-15 and US $ 14.4 billion (1.4% of GDP) in first half of 2015-16.

During April-November 2015-16, the total FDI inflows were US $ 34.8 billion as compared to US $ 27.7 billion during April-November 2014-15, showing a 26% surge. The FDI equity inflows also increased from US $ 18.9 billion during April-November 2014-15 to US $ 24.8 billion during April-November 2015-16, showing a 31% growth.

MINING INDUSTRY

The index of mineral production (with revised base year 2004-05=100) for all minerals (excluding atomic minerals) stood at 126.5 points in 2014-15 as against 124.7 points in 2013-14 registering an increase of about 1.4%.

Index for crude petroleum & natural gas and metallic minerals declined by 2.1% and 14.6%, respectively over 2013-14, whereas index for coal & lignite and non-metallic minerals increased by about 12.4% and 13.3%, respectively.

The total value of mineral production (excluding atomic minerals and also excluding value for February and March in respect of 31 minerals notified as minor minerals w.e.f. 10.02.2015) at ₹2,80,332 crore during 2014-15 increased marginally by1% as compared to the previous year due to increase in the production of coal, lignite, lead conc., zinc conc., limestone and magnesite. The increase in value of mineral is also due to increase in average prices of important minerals like bauxite, sillimanite and wollastonite. (Table-1)

The value of metallic minerals in 2014-15 at ₹ 38,597 crore decreased by about 9% over the previous year due to lower production reported in chromite, copper (concentrate), gold (primary), iron ore, manganese ore, silver and tin concentrates. Among the principal metallic minerals, iron ore contributed ₹ 28,534 crore or 74%, lead (concentrate) & zinc (concentrate) together ₹ 3,703 crore or 10%, chromite ₹ 1,819 or about 5%, manganese ore ₹ 1,363 crore or about 4%, silver ₹ 1,195 crore or 3%, bauxite ₹ 1,077 crore or 3% and the remaining value was from copper (concentrate), gold and tin concentrates.

**Table – 1 : Indian Mineral Industry : Value of Production*
2012-13 to 2014-15**

(In ₹ million)

Sector	2012-13 (R)	2013-14 (R)	2014-15# (P)	% change between		Sectoral contribution to the total value in %	
				2012-13 and 2013-14	2013-14 and 2014-15# (P)	2013-14	2014-15# (P)
Total : All Sectors	**2800056**	**2774133**	**2803324**	-0.93	+1.05	**100.0**	**100.0**
Fuels	1826892	1864669	1933720	+2.07	+3.70	67.22	68.98
(a) Solid fuel	802301	885023	974499	+10.31	+10.11	31.91	34.76
(b) Liquid & gaseous fuels	1024591	979646	959221	-4.39	-2.08	35.31	34.22
Metallic minerals	431639	423899	385966	-1.79	-8.95	15.28	13.77
Non-metallic minerals	74680	75161	73234	+0.64	-2.56	2.71	2.61
Minor minerals**	466845	410404	410404	-12.09	–	14.79	14.64

Figures rounded off individually.
** Excluding the minerals declared as prescribed substances under Atomic Energy Act, 1962.*
***Figures for the earlier years have been repeated as estimates wherever necessary for 2014-15 because of non-receipt of data.*
 # Excludes the data of 31 minerals for February and March, 2015, as these minerals have been declared as minor minerals vide Govt. of India's Notification S.O 423(E) dated 10th February, 2015.

In metallic ore, production decreased in respect of chromite (25%), copper concentrates (23%), iron ore (15%) and manganese ore (11%). The production of lead concentrate increased by about 2% during 2014-15. However, the production of gold was lower by 8% as compared to that of the previous year. The production of zinc concentrates increased marginally.

The value of production of non-metallic minerals at ₹7,323 crore during 2014-15 decrease by 3% from that of the previous year. Limestone with a contribution of 71% of the total value of non-metallic minerals, retained its leading position in 2014-15 in the group. The other important non-metallic minerals in value terms, were phosphorite/ rock phosphate (5%) and barytes (4%).

The index of mineral production (excluding atomic minerals) (with base year 2004-05=100) for 2014-15 at 126.5 displayed a growth of 1.4% as compared to the previous year.

India, in 2014-15, produced as many as 90 major and minor minerals which included 4 fuel minerals, 10 metallic minerals, 71 non-metallic, and 5 atomic minerals.

Indian Mining Industry is characterised by a large number of small operational mines. As per the revised data published in Monthly Statistics of Mineral Production (MSMP)-March, 2016 released by IBM the total number of reporting mines, (excluding atomic minerals, minor minerals, petroleum (crude) and natural gas (utilised)) in the country was 2,100 in 2015-16 as against 2,117 in 2014-15. Among them, 558 mines belonged to fuel minerals, 667 mines to metallic minerals and 875 mines to non-metallic minerals (Table-2). There were 660 mines in the Public Sector and the remaining 1,440 mines under Private Sector. The number of mines referred elsewhere in this Edition of IMYB may not tally with the above statistics as the data presented in the Mineral Reviews have been taken from MSMP, March-2015 Issue.

Table – 2 : Number of Reporting Mines 2014-15 (R) and 2015-16

Sector	2014-15 (R)	2015-16 (P)
All Minerals*	**2117**	**2100**
Public sector	670	660
Private sector	1447	1440
Coal (including lignite)	558	558
Metallic minerals	693	667
Non-metallic minerals	866	875

** Excluding atomic minerals, petroleum (crude), natural gas (utilised) and minor minerals.*

Source: *MSMP, March-2016.*

Role of Public Sector

The value of mineral production (excluding atomic minerals and the value for February and March 2015 in respect of 31 minerals notified as minor minerals w.e.f. 10.02.2015) in Public Sector was at ₹ 1,74,806 crore or 62% in the overall value of mineral production in 2014-15. The share of Public Sector in the total value of fuel minerals was 80%, in metallic minerals 46% and 18% in non-metallic minerals during the year.

The entire production of copper ore & conc. among metallic minerals and diamond, fluorite, selenite and sulphur in respect of non-metallic minerals was reported from the Public Sector. By and large, the entire production of lignite, gold (primary), gypsum and sand (others) came from Public Sector during 2014-15. Public Sector also had a sizeable contribution in production of coal and tin conc. (93% each), phosphorite/rock phosphate (91%), barytes, (90%), natural gas (ut.) (74%), petroleum (crude) (69%) graphite (62%) and magnesite (60%).

Gross Value Added from Mining & Quarrying Sector

The Ministry of Statistics & Programme Implementation has released the new series of national accounts, revising the base year from 2004-05 to 2011-12. The Industry-wise estimates are now presented as Gross Value Added (GVA) at basic prices. Certain changes have been made in this series including for Mining & Quarrying Industry. During 2014-15 Mining and Quarrying Industry accounted for about 2.4 % of the GVA at current prices. The GVA at current and constant prices for the period from 2012-13 to 2014-15 are detailed in Tables - 3 & 4.

Table - 3: Gross Value Added at Basic Price, 2012-13 to 2014-15 (At Current Prices)

(in ₹ crore)

Industry	2012-13 (NS)	2013-14 (NS)	2014-15 (PE)	% Change in 2014-15 over the previous year
GVA (All)	**9252051**	**10477140**	**11550240**	**10.2**
Mining & Quarrying	284771	298544	275812	- 7.6

***Source** : CSO* *NS : New Series Estimates* *PE : Provisional Estimates*

Table - 4: Gross Value Added at Basic Price, 2012-13 to 2014-15 (At 2011-12 Prices)

(in ₹ crore)

Industry	2012-13 (NS)	2013-14 (NS)	2014-15 (PE)	% Change in 2014-15 over the previous
GVA (All)	**8599224**	**9169787**	**9827089**	**7.2**
Mining & Quarrying	262253	276380	283062	2.4

Source : CSO. *NS: New Series Estimates* *PE: Provisional Estimates*

Employment

The estimated average daily employment of labour engaged in Mining Sector (excluding atomic and minor minerals) was 5,08,925 in 2014-15. Of this, 3,92,702 or 77% were in Public Sector and 1,16,223 or 23% in Private Sector. Fuel minerals accounted for 75%, metallic minerals 15% and non-metallic minerals 10% of the total labour force during the year.

India's ranking in 2014 in world production was 3rd in steel (crude), barytes, talc/steatite/pyrophyllite and zinc (slab) and coal & lignite; 4th in bauxite, chromite and iron ore; 5th in aluminium; 6th in copper (refined); 7th in manganese ore and 12th in magnesite. The statistics on indigenous and world production of principal minerals and metals are detailed in Table- 5

Table – 5: Contribution and Rank of India in World Production of Principal Minerals & Metals, 2014

Commodity	Unit of quantity	Production		Contribution (Percentage)	India's rank in order of quantum of production
		World	India*		
Mineral Fuels					
Coal & lignite	million tonnes	8085	658	8.1	3rd
Petroleum (crude)	million tonnes	4197	38	0.9	24th
Metallic Minerals					
Bauxite	'000 tonnes	260000	22494	8.5	4th
Chromite	'000 tonnes	30000	2164	7.2	4th
Iron ore	million tonnes	3378	129	3.8	4th
Manganese ore	'000 tonnes	54700	2369	4.3	7th
Industrial Minerals					
Barytes	'000 tonnes	9300	910	9.8	3rd
Kyanite, andalusite & sillimanite	'000 tonnes	403(e)**	72	17.8	3rd
Magnesite	'000 tonnes	47700	285	0.5	12th
Apatite & rock phosphate	'000 tonnes	245000	1608	0.6	17th
Talc/steatite/soapstone/ pyrophyllite	'000 tonnes	8300	921	11.1	3rd
Mica (crude)	tonne	343000	636	0.2	17th
Metals					
Aluminium	'000 tonnes	53000	2027	3.8	5th
Copper (refined)	'000 tonnes	22600	766	3.4	6th
Steel (crude/liquid)	million tonnes	1667	89@	5.3	3rd
Lead (refined)	'000 tonnes	10600	127	1.2	15th
Zinc (slab)	'000 tonnes	13600	733	5.4	3rd

Source: *World mineral production data compiled from World Mineral Production, 2010-2014; British Geological Survey.*
** Figures relate to 2014-15, MSMP, March, 2016*
*** Mineral Commodity Summary, 2015,USGS.*
@ Ministry of Steel, Annual Report, 2015-16.

MINERAL POLICY & LEGISLATION

The significant developments relating to National Mineral Policy and other mineral-related policies that took place in 2014-15 are highlighted below:

Mines and Mineral (Development and Regulation) Amendment Act, 2015

The MMDR Act, 1957 was amended through the MMDR Amendment Act, 2015 which came into force on January 12, 2015 has ushered in the regime of transparent and nondiscretionary grant of mineral concessions. The salient features of the Amendment Act are:

(a) Removal of discretion; Auction to be sole method of allotment

All mineral concessions are granted by the respective State Governments. They will continue to do so but all grant of mineral concessions would be through auctions, thereby bringing in greater transparency and removing of discretion. Unlike in the 1957 Act, there would be no renewal of any mining concession. The tenure of the mineral concession have been increased from the existing 30 years to 50 years. Thereafter, the Mining Lease would be put up for auction (and not for renewal as in the earlier system).

(b) Impetus to the Mining Sector

Mining Leases will now be granted for a term of 50 years. The said Act addresses the issue of second and subsequent renewals remaining pending leading to closure of large number of mines. The said Amendment Act provides that the Mining Leases would be deemed to be extended from the date of their last renewal to 31st March, 2030 (in the captive mines) and till 31st March, 2020 (for the non-captive mines) or till the completion of the renewal already granted, if any, whichever is later. It is expected that this would immediately permit such closed mines to start their operations.

(c) Safeguarding interest of affected persons

District Mineral Foundation is to be set up in each mineral-bearing district for local area development. This is designed to address the long time grievance of the civil society which is that the people affected by mining are not cared for. There is separate provision for contribution to the DMF not exceeding one-third of the royalty rate in the respective minerals.

(d) Encouraging exploration and investment

Indian Mining Industry has not seen the type and extent of exploration as in other countries. To address this, the said Act proposes to setup a National Mineral Exploration Trust created out of contribution from the mining lease holders. This would allow the Government to have a dedicated fund for undertaking exploration. In addition, the transferability provision (in respect of Mining Leases to be granted through auction) would permit flow of greater investment to the sector and increasing the efficiency in mining. The Reconnaissance Permits will henceforth be granted on non-exclusive basis.

(e) Simplification of procedure and removal of delay

In respect of ten minerals in Part C of First Schedule to MMDR Act 1957, State Government needed to obtain the prior approval of the Central Government before grant of mineral concession. The amendment removes the need for such prior approval from the Central Government, thereby making the process quicker and simpler. Similarly, approval of mining plan by the Government would no longer be mandatory as a provision has been added permitting the State Governments to devise a system for filing of a mining plan obviating the need for approval by the Government. The said Act also provides that the tenure of any Mining Lease would now be 50 years in place of 30 years in the existing Act. Further, Central Government has been given powers to intervene where State Governments do not pass orders within prescribed timelines.

(f) Stronger provisions for checking illegal mining

In order to bring a check on illegal mining, the penal provisions have been made further stringent. Higher penalties and jail terms have been provided in the Amendment Act. Further, a provision has been made for constitution of special courts by the State Government for fast-track trial of cases related to illegal mining.

(g) Notification on Minor Minerals

In exercise of powers conferred under Section 3 (e) of the MMDR Act, 1957, the Ministry of Mines declared 31 minerals as 'minor minerals'. The notification has been published in the Gazette of India vide (S.O. 423(E) dated 10.2.2015). So far 55 minerals have been notified as 'minor minerals' and consequently fall within the administrative jurisdiction of State Governments.

(h) New rules/Guidelines/model format

Government of India is in the process of simplifying and updating the 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 exploration to determine mineral content so that the mineral blocks could be taken up for auction of mineral concessions.

***Mineral (Auction) Rules, 2015*:** Rules prescribe the process to be followed for auction with respect to grant of mineral concessions.

Mineral (Non-exclusive Reconnaissance Permits) Rules, 2015: Rules deal with the process to be followed for grant of Non-exclusive Reconnaissance Permit.

National Mineral Exploration Trust Rules, 2015: Rules deal with the objectives, functions, operations of the National Mineral Exploration Trust.

Mineral Conservation and Development (Amendment) Rules, 2015: Rule that amends Rule 3(c) of MCDR 1988.

Other guidelines or model are also published as mentioned below:

* Model District Mineral Foundation Trust Deed

* Guidelines to support Mining Research

* Model Tender document containing the Mines Development and Production Agreement.

* **Mineral Conservation and Development (Amendment) Rules, 2016 - Amendment of Rule 45**: In the said rule, provisions were made for the mining companies to provide periodic reports on the extraction and disposal of the mineral material. Rule 45 of MCDR also facilitates end-to-end national scale accounting of all minerals produced in the country from the pit head to its end-use, reducing the scope for illegal mining, royalty evasion, etc. The amended Rule 45 now makes it mandatory for all miners, traders, stockists, exporters and end-users of minerals to register and report on the production, trade and utilization of minerals to the State Government(s) and Indian Bureau of Mines.

* **The Minerals (Mining by Government Company) Rules, 2015**:- The rules deal with the period of mining lease granted to Governmnet Companies or Corporations before 12th January 2015 and on or after 12th January, 2015. The above said rule prescribes that all mining leases granted to a Governmnet Company or Corporation for minerals shall be for a period of fifty years.

* **The Atomic Minerals Concession Rules, 2016**:- In the said rule, provisions were made for grant of Mineral Concessions relating to atomic minerals, prospecting for atomic minerals, discovery and grant of mineral concessions, mining plan for atomic minerals, terms and conditions of a mining lease, lapse, surrender or termination of mining lease, payment of compensation to owner of surface rights and revisions, etc.

* **The Mines and Minerals (contribution to District Mineral Foundation) Rules, 2015**:- The said Rules state that the amount of contribution to be made to District Mineral Foundation.

***Minerals (Transfer of Mining Lease Granted Otherwise that through Auction for Captive Purpose) Rules 2016**:- These Rules prescribe the procedures for transfer of a mining lease granted (excluding auction) for captive purpose.

* Finalisation of Mineral Conservation and Development Rules 2016 in progress.

Mineral (other than Atomic and Hydrocarbons Energy Minerals) Concession Rules, 2016: The Central Government by exercising the powers conferred under Section 13 of the Mines and Mineral (Development and Regulation) Act, 1957, framed the Mineral (other than Atomic and Hydrocarbons Energy Minerals) Concession Rules, 2016. The said Rules were notified and published vide notification No. G.S.R. 279(E) dated 4.3.2016. The salient features of above said Rules are as follows:

(i) Addition of new definitions: The new terms such as, composite licence, run-of-mine, scheme of prospecting, value of estimated resources, etc. were inserted.

(ii) New Chapter i.e. Chapter 3 - Mineral concessions granted through auction has been inserted.

(iii) Terms and conditions for composite licence have been mentioned.

(iv) Detailed provisions have been made for terms and conditions for a mining lease.

(v) Provisions have been made for Transfer of mining lease or prospecting licence-cum-mining lease granted through auction, termination of mineral concession not granted through auction which is in violation of transfer norms, etc.

EXPLORATION & DEVELOPMENT

GSI, DGMs of various States, Public Sector companies like NMDC, MECL, MOIL, GMDC, HGML, etc. continued their efforts of surveying, mapping and exploration of new deposits and reassessment of old deposits/ mines during 2014-15. In the Oil and Gas Sector, ONGC, OIL and a few joint venture and private companies were engaged in exploration of onshore and offshore areas in 2014-15. Exploration conducted by various organisations during 2014-15 is highlighted below:

Geological Survey of India (GSI)

The GSI is vested with the responsibility of maintaining broad-based and uniform national approach to data generation in respect of mineral resources. With the near exhaustion of resources to the proximity of surface, it has become imperative to have multidisciplinary approach to mineral exploration which comprises large-scale and detailed geological mapping aided by interpretative analysis of aerogeophysical and remotely sensed data, ground geophysical survey, geochemical prospecting and surface & subsurface exploration through pitting, trenching & drilling. GSI pursued its systematic geological mapping in 2014-15 and had completed 5,450 sq km large-scale mapping, 73.543 sq km detailed mapping and 87,465.87 m drilling as against preceding year's achievement of 5,264 sq km large-scale mapping, 62.525 sq km detailed mapping and 68,037 m drilling. Out of the total mappable areas of 3.14580 million sq km of the country, 3.09935 million sq km has been covered so far by systematic mapping bringing the total coverage to 98.52%. The highlights of the resources assessed are given below in brief :

Resources augmented by GSI during 2014-15 are furnished below:

i) A total of 155.34 million tonnes (Fe:50.40-62.11%) of iron ore resources in distt. Sundargarh , Odisha and distt. Kabirdham , Chhattisgarh.

ii) A total of 21.023 million tonnes (Cu: 0.22-0.76%) of copper ore resources in distt. Alwar, distt. Banswara & distt. Sikar , Rajasthan.

iii) A total of 5.895 million tonnes (Au: 0.88g/t -1.78 g/t) resources of gold ore in distt. Tumakuru , Karnataka and distt. Banswara , Rajasthan.

iv) A total of 635.30 million tonnes (K_2O:4.8%) of glauconite (Potash) resources in distt. Sonbhadra , Uttar Pradesh.

v) A total of 250.773 million tonnes of limestone (CaO: 43-46%) in distt. Guntur, Andhra Pradesh; distt. West Siang, Arunachal Pradesh and distt. Jaintia Hills , Meghalaya.

vi) A total of 4.73 million tonnes of graphite (FC: 9-11.68%) in distt. Betul , Madhya Pradesh and

vii) A total of 24.2 million tonnes of andalusite resources in distt. Sonbhadra , Uttar Pradesh.

GSI continued its offshore geo-scientific studies both in Exclusive Economic Zone (EEZ) and Territorial Waters (TW) along the East and West Coasts of India. During 2014-15, a total of 17 cruises were undertaken using three vessels; 7 cruises aboard R.V. Ratnakar and within EEZ; 6 cruises aboard R.V. Samundra Kaustubh within the TW off the East Coast; and 4 cruises aboard R.V. Samundra Shaudhikama within the TW off the West Coast. Surveys in the near shore zones were carried out using hired small mechanised boats.

GSI pursued its airborne geophysical surveys for generating database employing magnetic and gamma ray spectrometric techniques. During 2014-15, Twin Otter Airborne Survey System (TOASS) and Heliborne Geophysical Survey System (HGSS) could not be taken up due to a number of technical and related issues. However, processing of multisensor heliborne geophysical data acquired while conducting test flights over the distt. Aladahalli are taken up for a ascertaining the response of the HGSS.

Since the acquisition and induction of TOASS, a total of 4,95,062 line km, over an area of 2,94,045 sq km, was covered by multi-sensor survey involving magnetic, spectrometric, radiometric and electromagnetic methods till the field season 2010-12.

MECL

A total of 4,105 million tonnes of mineral resources were established. Mineral-wise details of resources estimated by MECL during 2014-15 are:

i) A total of 3,547 million tonnes of coal resources were established in Mand-Raigarh Coalfield, Chhattisgarh; Godavari Valley Coalfield, Telangana; and Singrauli Coalfield, Madhya Pradesh.

ii) A total of 392 million tonnes of lignite resources were established inTamil Nadu.

iii) A total of 42 million tonnes of cement grade limestone resources were established in Nimi-Pyakatsu Block, Nagaland.

iv) A total of 11 million tonnes of copper ore resources were established at Chandmari Intervening block, Khetri Copper Belt, Jhunjhunu, Rajasthan.

v) A total of 0.530 million tonnes of lead-zinc resources were established in Gurla South block, Bhilwara, Rajasthan.

vi) A total of 2.65 million tonnes of gold ore resources were established at Parasi East Block, Ranchi, Jharkhand; Phardia Block, Ranchi, Jharkhand; and Phardia Gold Prospect, Raigarh, Chhattisgarh.

vii) A total of 110 million tonnes of iron ore resources were established at Sandur Schist Belt, distt. Ballari , Karnataka.

State Directorates of Geology and Mining

DGM, Chhattisgarh, established about 105.20 lakh tonnes of coal resources (332 category) in Surguja distt.; 4.43 lakh tonnes of bauxite in Kabirdham distt. & about 4 lakh tonnes of bauxite (metal grade) in Surguja distt.; about 755.24 lakh tonnes of limestone resources in Raipur distt.; and about 30 million tonnes dolomite resources in Janjgir-Champa distt.

DMG, Rajasthan, estimated about 204 million tonnes of cement-grade limestone in Jaisalmer distt. & 72.95 million tonnes of limestone resources including cement-grade in Nagaur distt.; about 15.40 million tonnes of lignite resources in Bikaner distt.; about 80 million tonnes and 0.726 million tonnes of masonry stone & limestone, respectively in Bundi distt.; and about 13.725 million tonnes of sandstone in non-forest areas in Jhalawar and Baran districts.

DGM, Uttar Pradesh estimated about 0.01 million tonnes of tentative reserves of platinum and about 1,774.5 kg of low-grade gold ore in Lalitpur district.

DGM, Kerala established about 0.73 million tonnes tentative resources of sandy clay in Kollam district and about 13 million tonnes tentative resources of variegated clay and that of 7.2 million tonnes of laterite/aluminous laterite in Kannur district.

DGM, Maharashtra established about 258.99 million tonnes, 42.501 million tonnes and 7.36 million tonnes coal resources in Chandrapur, Nagpur and Yavatmal districts, respectively; and about 3.82 million tonnes of pyrophyllite/sillimanite in Chandrapur district.

DGM Assam established 0.33 million tonnes of coal resources in Karbi Anglong district.

Oil and Natural Gas Corporation Ltd (ONGC)

ONGC continued its operations for exploration of oil and gas and reported 22 new hydrocarbon discoveries in 2014-15. As a result of these exploratory efforts, ONGC accreted 61.05 million tonnes as on 1.4.2015, leading to 2,790 million tonnes ultimate reserves of oil and oil-equivalent gas (O+OEG) at the end of the year in areas under its operations.

Oil India Ltd (OIL)

OIL continued its operations for exploration of crude oil and natural gas in 2014-15 and carried out 140 thousand meters drilling in 37 wells in onshore areas. Exploration resulted in significant discoveries of oil/gas within Upper Assam Basin and NELP-VI block KG-ONN-2004/1.

Indian Bureau of Mines (IBM)

IBM as a facilitator to the Mineral Industry (a) provided technical consultancy services in feasibility study, environmental impact assessment, environmental management plan, etc.; (b) carried out mining research on need-based aspects of mining; (c) conducted mineral beneficiation studies, including mineralogical testing and chemical analysis; and (d) prepared mineral maps. Besides, preparation of National Inventory of mineral resources is IBM's designated responsibility. The National Mineral Inventory (NMI) is brought out by IBM on a quinquennial basis. UNFC system has been adopted by IBM for resource classification. Updating of NMI of mineral resources in respect of 25 minerals based on UNFC system, as on 1.4.2013, has been completed. Presently updation of NMI as on 1.4.2015 has been taken up.

During 2014-15, IBM prepared 100 multi-mineral leasehold maps with forest overlays on 1:50000 scale in respect of Andhra Pradesh, Bihar and Kerala states. Forest overlays are prepared in collaboration with Forest Survey of India.

During 2014-15, IBM conducted 58 ore dressing investigations, chemical analysis in respect of 34,660 radicals, and 2,244 mineralogical studies.

Other Agencies

GMDC estimated a total of 4.18 million tonnes of lignite resources in Kachchh distt.

Exploration by HGML has established 0.541 million tonnes proved reserves of gold ore (4.31 g/t Au) in Hira-Buddini areas in Raichur distt. of Karnataka and 1,687 kg probable gold ore reserves in Lalitpur distt. of Uttar Pradesh.

Reliance Industries Ltd (RIL)

During the year 2014-15, RIL and Myanmar Oil & Gas Enterprise (MOGE), an enterprise of the Government of Myanmar, signed a production sharing contract for two offshore blocks (M17 and M18) in the Tanintharyi basin of Myanmar. RIL will be the operator of the blocks with a 96% participating interest. The United National Resources Development Services Co. Ltd (UNRD), a Myanmar company, hold the remaining interest in the block. Gas production from the KG-D6 field declined by 12% to 157.6 billion cubic feet (BCF) in FY 2014-15. Efforts by RIL and its JV partners to augment production from the field through interventions like side track wells and onshore terminal booster compressor helped partly offset the natural decline in the field.

During the year, RIL made significant progress towards development of two Coal-Bed-Methane (CBM) blocks namely Sohagpur East and Sohagpur West. Detailed engineering and construction activities have been completed. RIL expects first gas production from these block during FY 2015-16.

RESEARCH & DEVELOPMENT

The Science and Technology (S&T) programmes of the Ministry of Mines, Government of India, cover the disciplines of Geology, Exploration, Mining, Bioleaching, Beneficiation, Rock Mechanics, Ground Control and Non-ferrous Metallurgy and Environmental Issues related to Mining and Metallurgy. During 2014-15, a meeting was held on 04.12.2014 by Project Evaluation and Review Committee (PERC). Based on the Committee's scrutiny report, Standing Scientific Advisory Group (SSAG) considered and recommended Granting Aid under S & T programme of the Ministry of Mines. The SSAG approved eleven project proposals for Granting Aid under the S&T Programme and for five on-going projects recommended extension of project period up to 31st March 2015.

The highlights of work carried out during 2014-15 by IBM relating to mineral beneficiation and mining & environment are given below:

Chromite

***Bench-Scale Beneficiation Studies on a Low-grade Chromite (Feed) Sample from M/s Misrilall Mines (P) Ltd Saruabil, Distt. Jajpur, Odisha*:** A low-grade chromite (Feed) sample was collected under Regional Mining Geological Studies for bench-scale beneficiation studies at Modern Mineral Processing Laboratory and Pilot Plant, IBM, Nagpur and to confirm the grade and recovery from the operating plant and also to assess the possibilities of improving the recovery of concentrates and minimizing the tailing losses of valuables if possible. The aim of the investigation was to produce a chromite concentrate suitable for industrial use and to reduce Cr_2O_3 content below 10% in the tailings.

The as received sample that assayed 34.87% Cr_2O_3, 15.73% Fe, 8.23% Al_2O_3, 23.34% SiO_2, 0.24% CaO, 8.31% MgO, 0.24% TiO_2 and 2.39% LOI after being subjected to beneficiation route of wet sieving followed by tabling of -50 to +325 mesh sieve fraction followed by dry high intensity magnetic separation of table middling and multi-gravity separation of –325 mesh sieve fraction and further yielded the composite concentrate that assayed 54.29% Cr_2O_3, 12.79% Fe, 10.72% Al_2O_3, 8.83% SiO_2, 0.20% CaO, 7.10% MgO, 0.34% TiO_2 and 47.33% LOI with 83.6% Cr_2O_3 recovery (wt% yield 53.0). A chromite concentrate with a higher grade as well as recovery was obtained and the tailing losses were also minimized to 6.66% Cr_2O_3.

Gold Ore

Beneficiation Studies on a Gold Ore Sample from Togo for M/s VSR Trading Limited, Hyderabad: A gold ore sample from Togo, sent by M/s VSR Trading Limited, Hyderabad,was taken up for beneficiation studies at RODL, IBM, Bengaluru. The objectives of the investigations were to (i) carry out detailed chemical analysis and mineralogical studies and (ii) to maximise the recovery of gold by ore dressing techniques.

The as received sample that assayed 18.88 ppm Au, 10.69 ppm Ag, 83.31% SiO_2, 4.63% Al_2O_3, 3.90% Fe_2O_3, 1.25% LOI, 0.14% MgO, 1.69% CaO and 0.27% Na_2O afer being subjected to tabling process yielded a table concentrate that assayed 142.21 ppm Au with 42.2% recovery (Wt% yield is 5.3). Pre concentrate of the ore by tabling followed by cyanide leaching tests on table rejects ground to minus 200 mesh resulted 95.2% gold recovery with residue that assayed 0.83 g/t gold. Direct cyanidation on ground original sample at minus 200 mesh size, resulted in 94.3% gold recovery. Leach residue, however, assayed 1 g/t Au.

Iron Ore

Bench-scale Beneficiation Studies on a Low-grade ROM Iron Ore Sample from Shahgarh Area, Distt. Sagar, M.P. for M/s S.V. Modi Mines, Shahgarh, Distt. Sagar, M.P.: A low-grade ROM iron ore sample was received from M/s S.V. Modi Mines, Shahgarh, Distt. Sagar, M.P., for bench-scale beneficiation studies at the Modern Mineral Processing Laboratory & Pilot Plant, Indian Bureau of Mines, Nagpur. The objective of the study was to explore the possibility of obtaining value added product for its better marketability.

The ROM sample assayed Fe (T) 43.66%, SiO_2 21.71%, Al_2O_3 6.66%, TiO_2 0.51%, CaO 0.68%, MgO 50%, P 0.14%, Mn 0.14% and LOI 5.75%.

The major iron minerals are goethite/limonite and haematite. Quartz is the major gangue mineral with subordinate amount of clay, very minor amount of mica (muscovite, biotite) and trace amount of pyroxene (diopside), carbonate (calcite) and talc.

Inferences of the beneficiation studies carried out reveal that the sample can yield only a blendable grade (over 55% Fe) iron ore concentrate. The beneficiation process adopted included screening of ROM ore to three size fraction of - 80 to +40/50 mm, - 40/50 to +18 mm and -18 mm. The screen oversize (+40/50 mm) was resorted to after hand picking of heavy iron ore lumps for rejecting quartz. The intermediate screen size of +18 mm was reduced to all -18 mm size. The entire -18 mm (inclusive of screen undersize of -18 mm) was then screened over 5 mm size and screen undersize was rejected. The -18 to +5 mm size fraction was then processed by deployment of Jig (air/water) to obtain jig concentrate after the lighter gangue was rejected as jig tails.

The evolved process route of beneficiation produced a composite iron ore lump (-80 to +40/50 mm and -18 to +5 mm) concentrate assaying 55-58% Fe(T), 3.7-4.1% Al_2O_3, 7.90-8.20% SiO_2 & 4.10-4.26% LOI with iron recovery of 43 to 47% (%wt. yield 42-47).

The blendable grade lumpy concentrate produced from a very low-grade ROM iron ore could find application in DRI making.

Beneficiation Studies on Iron Ore sample from Jabalpur, Madhya Pradesh for M/s Gulf Ispat Limited, Jabalpur: An Iron ore sample that assayed 46.20% Fe(T), 22.02% SiO_2, 5.33% Al_2O_3, 2.36% LOI, 0.064% CaO, 0.07% MgO, 1.30% Mn, 0.10% P and 0.52% TiO_2 was sent by M/s Gulf Ispat Limited, Jabalpur for beneficiation studies at the RODL, IBM, Bengaluru. The objectives of the investigation were to (i) carrry out chemical analysis and mineralogical studies & (ii) upgrade the ore to +60% Fe (T) by ore dressing techniques with maximum Fe (T) recovery.

The analytical process firstly involved tabling process on -48 mesh size that produced a table concentrate. Subsequently, on application of wet high intensity magnetic separation process on (i) table middling and tails followed by (ii) mixed minus 100 mesh obtained both magnetic and non-magnetic concentrates produced both. The table concentrate and both magnetic concentrates were combined to yield a final concentrate that assayed 60.38% Fe (T), 5.61% SiO_2, 3.14% Al_2O_3, 1.32% Mn, 0.06% P and 0.45% TiO_2 with 85.6% Fe (T) recovery (Wt.% yield 65.3).

The iron ore sample was successfully upgraded from 46.20% Fe (T) to 60.38% Fe (T) with 85.6% Fe (T) recovery which is quite a significant achievement.

Limestone

***Beneficiation Studies on a low grade Limestone Sample from Kovaya, Distt. Amreli, Gujarat, M/s UltraTech Cement Ltd*:** A low-grade limestone sample from Kovaya, district Amreli, Gujarat of M/s UltraTech Cement Ltd was successfully tested on bench-scale to produce a concentrate suitable for Cement Industry that assayed 45.05% CaO, 2.22% Al_2O_3, 1.79% Fe_2O_3 and 12.55% SiO_2 with CaO distribution of 69.0% (wt% yield 41.4). The concentrate was produced from a low-grade ore that assayed 26.84% CaO, 6.16% Al_2O_3, 6.55% Fe_2O_3 and 31.14% SiO_2. The process adopted comprised scrubbing of the as received sample followed by screening and direct flotation of -50 mesh screened product. The grinding circuit was eliminated. The +50 mesh fraction and flotation concentrate were then combined to yield the final concentrate. Thus a simple and cost-effective flow sheet developed produced significant results.

Rock Phosphate

***Bench-scale Beneficiation Studies on a Low- grade Rock Phosphate Sample from Jhamarkotra, Udaipur, Rajasthan for M/s Hindustan Zinc Ltd*:** A low-grade rock phosphate sample from the Jhamarkotra mines, Udaipur district, Rajasthan sent by M/s Hindustan Zinc Ltd was taken up for bench-scale beneficiation studies at RODL, IBM, Ajmer. The objectives of the investigation were (a) to produce an upgraded phosphate concentrate and (b) reduce the iron, silica and alumina in the phosphate concentrate.

The as received sample that assayed 10.42% P_2O_5, 15.20% CaO, 6.62% Fe_2O_3, 4.01% Al_2O_3, 56.28% SiO_2, 0.02% MgO, 0.14% Na_2O, 0.97% K_2O, 0.02% S (T), 1.12% BaO, 0.22% TiO_2, 4.61% LOI (including Moisture 0.11%) by adoption of flotation test studies yielded a final concentrate that assayed 30.03% P_2O_5, 2.81 % Fe_2O_3, 0.92% Al_2O_3, 8.84% SiO_2 with 78.9% recovery (Overall Wt.% yield 27.6).

The rock phosphate concentrate generated met the specifications presscribed for the elemental rock phosphate-Type-1 and can be used after blending with high-grade ores because it's (Al_2O_3+ Fe_2O_3) content is slightly higher.

Development of Mineral Processing flow sheet to Recover Phosphate Mineral from a Tailing Sample from Jhamarkotra Phosphate Processing Plant for M/s Jai Drinks Pvt. Ltd, New Delhi: A tailing sample from Jhamarkotra Phosphate Processing plant was sent by M/s Jai Drinks Pvt. Ltd, New Delhi for bench scale beneficiation studies to RODL, IBM, Bengaluru. The main objective of the study was to recover the phosphate mineral from the sample which was put aside during processing of run-of-mine and upgrade it to the level of saleable grade for different applications.

The as received sample that assayed 7.86% P_2O_5, 3.14% SiO_2, 32.88% CaO, 13.62% MgO, 0.27% Al_2O_3, 0.36% Fe_2O_3, 0.56% Na_2O, 0.07% K_2O, 0.32% chlorine, 0.75% fluorine and 32.62% LOI, after floation test studies yielded a combined phosphate concentrate that assayed 28.48% P_2O_5 with revovery of 78.0% (Wt% yield 22.2).The process flow sheet thus developed was simple to operate and flexible and yielded various grade products.

INFRASTRUCTURE

Development of the Infrastructure Sector has been a priority area for the government and has witnessed enhanced public investment. Many reforms have been initiated in the Infrastructure Sector, resulting in robust growth in most of its segments namely, power, road, railways, civil aviation, ports and telecommunication. All the segments performed better during 2014-15 as compared to 2013-14. During 2014-15, electricity generation was 1,048.4 billion units (BU) as against a target of 1,023 BU, registering Y-O-Y growth of 8.4%. Continuing with similar trends electricity generation in the country during the current year (April-December 2015) registered a growth of 4.4%. Considering the renewable energy potential of the country, the government has laid major emphasis on this Sector. A total of 3,030 MW of grid-connected power generation capacity from renewable energy sources like solar and wind has been added so far this fiscal (April-December), taking the cumulative generation capacity in the country to over 38,820 MW.

In Indian Railways, the freight transit data shows an increase of 9.0 million tonnes during April-November 2015, over the freight traffic of 2014-15, translating into growth of 1.3%. Under the National Highways Development Project (NHDP), a total length of 26,177 km road has been completed as on 31st December 2015. Similarly, the Civil Aviation Sector witnessed an improvement of 20.4% in domestic traffic and 7.8% in international passenger traffic during April-November 2015-16 over the same period of the previous year. During April-September 2015, while cargo traffic at all ports increased by 1.1%, major ports reported an increase of 4.1% and non-major ports a decline of 1% as compared to the corresponding period in 2014-15. The performance of the Telecommunication Sector during 2015-16 has been encouraging, with approximately 33.4 million new telephone connections added during April-October 2015, which is way ahead of the 29.7 million new connections in the corresponding period of 2014-15.

Coal

Coal production at around 609.2 million tonnes in 2014-15 was higher by 7.7% from that of 565.76 million tonnes in 2013-14. In 2014-15, out of the total production of coal, 9.4% (57.26 million tonnes) was of coking coal and the remaining 90.6% (552 million tonnes) was of non-coking coal. Of the 603.8 million tonnes despatches of raw coal in 2014-15, about 80.5% despatches were to Electricity Sector, 2.7% to the Steel Industry, 2.2% to Sponge Iron Industry, 2% to Cement Industry, 0.4% to the Fertilizer and 0.31% to the Paper & Pulp Industry.

Electricity

In order to restructure the sector, various amendments are being introduced in the Electricity Act, and to the tarrif policy in collaboration with the States. During 2014-15, the achievement in electricity generation exceeded the target. Against the target of 1023 BU, the achievement was 1,048.4 BU, registering Y-O-Y growth of 8.4%. The annual generation crossed 1 trillion units last year. In the current year (April-December 2015), generation registered a growth of 4.4%. This is 97.6% of the target of 849.9 BU during 2015-16 (April-December). In April-December 2015-16, in the Thermal Category, growth in generation from coal, lignite and gas-based stations was of the order of 6.2%, 4.1% and 7.9%, respectively. Growth in the generation of thermal power, which is the primary source of power in India, was achieved due to enhanced availability of coal and statutory clearances provided for a number of projects. Further, as against the capacity addition target of 20,037.1 MW set for 2015-16, 11,226 MW have been added till December 31, 2015. The cumulative capacity addition during the 12th Plan, as on December 31, 2015 is 72,240 MW, which constitutes 81.6% of the plan target.

Transport

Railways

Indian Railways consist of an extensive network spread over 65,000 Route km (Rkm) comprising broad guage (56,000 Rkm), metre guage (7000 Rkm) and narrow guage (2,000 Rkm). The Indian Railways focussed on prioritising investments in important areas like dedicated freight corridors, high speed rail, high capacity rolling stock, last mile rail linkages and port connectivity and attracting private and FDI investments to supplement available resources. During 2015-16 (up to November) IR carried 720.17 million tonnes of revenue-earning freight traffic, as against a budget target of 775.77 million tonnes. This was up from the 711.19 million tonnes of freight carried during 2014-15 (up to November) by 8.98 million tonnes or 1.26%.

Various measures to improve passenger amenities, infrastructure & services, and initiatives under Make in India, freight initiative, resource mobilisation initiative and green initiatives, etc. have been taken for High Speed Train Project. Optical

Fibre Cable (OFC) over 1098 Route kilometres (Rkm) has been laid. Cumulatively, 48,818 Rkm optical fibre has been commissioned by IR, enabling a high speed communication network. Integral Coach Factory, Chennai, has developed a first-of-its-kind stainless steel three-phase energy-efficient AC-AC transmission 1600 HP DEMU train set.

Ports

India's coastline of 7,517 km, spread on the western and eastern shelves of the mainland and also along the islands is studded with 12 major ports and about 200 non-major ports. Approximately, 95% of the India's trade by volume and 68% by value are moved through Maritime Transport. Twelve major ports of the country handle about 75% traffic.

Cargo handling capacity at major ports was 811.52 million tpy in 2014-15 as compared to 800.52 million tpy in 2013-14. Traffic handled by major ports was 581.34 million tonnes in 2014-15 as compared to 552.52 million tonnes in 2013-14. Traffic handled at major ports relating to minerals/mineral products during 2014-15 was: POL 188.74 million tonnes, iron ore 16.60 million tonnes, thermal coal 85.28 million tonnes and fertilizer 16.22 million tonnes.

Roads

With about 52.32 lakh km of road network comprising National Highways, State Highways and other roads, India has the second largest road network in the world. The National Highways (NH) in the country cover a total length of 1,00,475 km and carry about 40% of the road traffic. A total length of 26,177 km has been completed and 13,041 km is under implementation till December 2015 under various phases of the NHDP.

PERFORMANCE OF SELECTED MINERAL-BASED INDUSTRIES

Steel

Production of finished steel (including C.R. sheets) in 2014-15 at 92.15 million tonnes was higher by about 5.11% from 87.67 million tonnes achieved in 2013-14. The total production of pig iron was 9.7 million tonnes and about 8 million tonnes in 2014-15 and 2013-14, respectively. Exports of finished steel (including C.R sheet) were 5.19 million tonnes in 2014-15 as compared to 5.12 million tonnes reported in 2013-14. Also, 0.65 million tonnes pig & cast iron, including spiegeleisen were exported in the corresponding periods.

Cement

Production of cement in 2014-15 at 276.93 million tonnes registered an increase of about 8.15% over the previous year's production of 256.04 million tonnes. Cement Industry has been undergoing a transition with modernisation and upgradation of technology particularly with a view to conserve energy. The country is self-sufficient in cement. India exports cement including white cement and clinker. The exports in 2014-15 and 2013-14, including clinker were about 6.28 million tonnes and 5.1 million tonnes, respectively.

Petroleum Oil and Refineries

Crude oil production in 2014-15 at 37.78 million tonnes registered a marginal decrease of 0.2% as compared to that in the previous year. The production of natural gas (utilised) was at 33,656 million cubic metres (m cu m) in 2014-15, 5% lower than 35,407 million cubic metres achieved in 2013-14. The refinery crude throughput of 223.24 million tonnes in 2014-15 was 0.33% higher than 222.5 million tonnes processed in 2013-14. The total refining capacity in the country was about 215.06 million tpy as on 1.4.2015. Production of petroleum products (including LPG production from natural gas) was 221.13 million tonnes in 2014-15 as compared to 220.75 million tonnes reported in 2013-14.

SELF-RELIANCE IN MINERALS & MINERAL-BASED PRODUCTS

India continued to be wholly or largely self-sufficient in minerals which constitute primary mineral raw materials that are supplied to industries, such as, iron & steel, ferro-alloys, aluminium, cement, various types of refractories, china clay-based ceramics, glass, chemicals like caustic soda, soda ash, calcium carbide, titania white pigment, etc. India is self-sufficient in bauxite, chromite, iron ore and ilmenite among metallic minerals and almost all the industrial minerals with the exception of chrysotile asbestos, borax, fluorite, potash, rock phosphate and elemental sulphur. Despite high degree of self-sufficiency, some quantities of flaky and amorphous graphite of high fixed carbon, kaolin and ball clay for special applications, very low silica limestone, dead-burnt magnesite & sea water magnesia, battery-grade manganese dioxide, manganese ore, etc. were imported to meet the demand for either blending with locally available mineral raw materials and/or for manufacturing special qualities of mineral-based products. To meet the increasing demand of uncut diamonds, emerald and other precious & semi-precious stones by the domestic Cutting and Polishing Industry, India is dependent on imports of raw uncut stones for their value-added re-exports. The degree of self-sufficiency in respect of various principal minerals and metals/ ferro-alloys in 2014-15 is given in Table-6.

Table – 6 : Degree of Self-sufficiency in Principal Minerals & Metals, 2014-15 (P)

Sl. No.	Commodity	Demand/Domestic consumption ('000 tonnes)	Supply/Domestic supply* ('000 tonnes) (R)	Order of self-sufficiency (%)
Minerals				
1.	Barytes*	138	911	100
2.	Bauxite	13625	22494	100
3.	Chromite	2313	2164	94
4.	Dolomite*	7230	6209	86
5.	Felspar*	465	1343	100
6.	Fireclay*	512	713	100
7.	Fluorite	63	3	5
8.	Ilmenite	203	641	100
9.	Iron ore	113481	129321	100
10.	Kyanite	3	6	100
11.	Limestone & other calcareous minerals	269234	295580[1/]	100
12.	Magnesite	365	285	78
13.	Manganese ore	4195	2369	56
14.	Rock phosphate (including apatite)	4275	1608	38
15.	Rutile	26	16	62
16.	Sillimanite	22	66	100
17.	Silica minerals*	2490	5018	100
18.	Talc/steatite/soapstone/pyrophyllite*	381	922	100
Metals[2/]				
19.	Aluminium	2589	2027	78
20.	Copper (refined)	435[3/]	766	100
21.	Lead (primary)	188[4/]	127	67
22.	Zinc	590[5/]	733	100

***Source: Consumption**: Data based on statutory & non-statutory information; **Production**: MCDR Returns & MSMP, March, 2015 for production data.*

**: Figures relate to 2014-15. Production for minor minerals namely for barytes, dolomite, felspar, fireclay, limekankar, talc/ steatite, pyrophyllite, quartz, quartzite and silica sand is up to January, 2015.*

Figures rounded off.

***Note:** Even in cases where almost entire domestic demand is satisfied by domestic supplies, some quantities of certain special quality/types of minerals and metals/ferro-alloys are imported to meet the requirement in certain specific end-uses.*

1/ Excludes production of limestone as a minor mineral, calcite and chalk and includes limeshell, limekankar and marl.

2/ Apparent demand (production+ import-export).

3/ Based on production of copper cathode and imports & exports of refined copper.

4/ Based on production of lead (primary), and imports & exports of refined lead, unwrought.

5/ Based on production of zinc (ingots) and imports & exports of zinc (not alloyed).

FOREIGN TRADE

Over the last ten years, India's merchandise trade (on customs basis) increased manifold from US $ 195.1 billion in 2004-05 to US $ 778 billion in 2014-15 helping India's share in global exports and imports improve from 0.8% and 1.0% respectively in 2004 to 1.7% and 2.4% in 2014. Its ranking amongst the leading exporters and importers improved from 30 and 23 in 2004 to 19 and 12 in 2014 as per the WTO International Trade Statistics 2015.

India's merchandise exports declined year-on-year by 17.6% to reach US $ 217.7 billion in 2015-16 (April-January). In 2015-16 (April-January), imports declined by 15.5% to US $ 324.5 billion as compared to US $383.4 billion in 2014-15 (April-January). Lower imports of petroleum, oil and lubricants (POL) were the main reason for the decline in total imports this year so far. POL imports declined by 41.4% to US $ 73.1 billion in 2015-16 (April-January) as against US $ 124.8 billion in 2014-15 (April-January), as a result of steep fall in international crude oil prices. Moderation in trade deficit in 2014-15 was due to, among other factors, decline in the value of POL imports by 16.0% caused by fall in international oil price by 20.2% in 2014-15. The moderation continued through 2015-16 with further decline in global crude oil prices, with trade deficit in 2015-16 (April-January) placed at US $ 106.8 billion.

Exports

According to the data available, the total exports (including re-exports) of all merchandise in 2013-14 and 2014-15 were ₹19,05,011 crore and ₹18,96,348 crore, respectively. The ores and minerals group (including diamond, precious and semi-precious stones) earned foreign exchange worth ₹1,94,784 crore and ₹1,78,077 crore in 2013-14 and 2014-15 respectively thereby, posting a decrease of about 8.58% as compared to that in the previous year. Contribution of cut diamonds in 2013-14 & 2014-15 was ₹ 1,58,005 crore and ₹ 1,48,056 crore while that of iron ore was ₹ 9,481 crore and ₹ 32,111 crore, respectively.

Diamond continued to be the largest constituent item with a share of 83.17% in the total value of mineral exports in 2014-15. Next in order was granite with a share of 5.52% followed by alumina with 1.85% and iron ore with 1.8 percent. The individual share of remaining minerals in the total value of exports of ores and minerals from India during the year under review was less than one percent.

The export of selected mineral-based products during 2013-14 and 2014-15 was valued at ₹ 3,73,955 crore and ₹ 2,93,825 crore, respectively. The exports of petroleum products, e.g., light distillates (naphtha and others), middle distillates and heavy ends, earned foreign exchange of ₹ 3,68,277 crore and ₹ 2,88,562 crore in 2013-14 and 2014-15, respectively, with more than 98% share in both the years in the export of selected mineral-based products.

India also exported metals and alloys valued at ₹ 1,53,156 crore and ₹ 1,67,120 crore during 2013-14 and 2014-15, respectively. Iron & steel, with a share of 52.01%, continued to hold the top position in the total value of metals exported from India in 2014-15. Copper & alloys (including brass & bronze) accounted for 12.31 percent. Aluminium and alloys including scrap and gold (non-monetary & monetary) contributed 10.4% and 10.3%, respectively. The contribution of ferro alloys was 5.97%, nickel and alloys including scrap was 3.3%, zinc and alloys including scrap was 2.25% and precious metals/metals clad with precious metals 1.5 percent. The individual share of other remaining metals and alloys was less than one percent.

Imports

The total imports of all merchandise in 2013-14 and 2014-15 were ₹27,15,434 crore and ₹27,37,086 crore, respectively. The value of imports of ores and minerals in 2014-15 decreased by 11.86% to ₹10,71,689 crore from ₹12,15,827 crore in 2013-14. Petroleum (crude) continued to be the largest constituent item with a share of 66.19% in the total value of mineral imports in 2014-15. Next in order of importance was diamond with a share of 11.68 % followed by coal (excluding lignite) with the contribution of 9.75%, natural gas 5.26 % and copper ores & concentrates 2.66 percent. The combined share of these five minerals was 95.54% in 2014-15 as against 97.2% in the previous year.

The import of selected mineral-based products during 2013-14 and 2014-15 was valued at ₹96,402 crore and ₹97,668 crore, respectively. The imports of petroleum products in 2014-15 declined by 2.45% in value over the preceding year to ₹72,778 crore and had a share of 74.51% in the value of import of selected mineral-based products during 2014-15.

The value of imports of metals and alloys at ₹4,01,259 crore showed an increase of 24.86% in 2014-15 from ₹3,21,356 crore in 2013-14. Gold, non-monetary & monetary (total) with a share of

52.5% continued to occupy the top position in the total import value of metals & alloys in 2014-15 followed by iron & steel with a share of 23.44%, silver 6.9%, aluminium & alloys including scrap 5.7%, copper & alloys (including brass & bronze) 4.9%, nickel & alloys including scrap 2.12 % and ferro alloys 1.19 percent. The individual share of remaining metals was less than one percent of the total value of metals & alloys imports.

VALUE-ADDED EXPORT TRADE

India's foreign trade includes exports of minerals, both in the raw form and semi-processed & processed forms like mineral-based primary manufactured products.

Minerals contributed significantly to India's exports trade in 2014-15 with a share of about 9.39% (i.e., ₹1,78,077 crore) in the total value of all merchandise. The contribution of minerals in exports in raw/unprocessed forms was about ₹19,430 crore and in semi-processed/processed forms was about ₹1,58,647 crore. The manufactured mineral-based products contributed about ₹4,60,239 crore in 2014-15 to the total value of exports of all merchandise. The value-added semi-processed/processed minerals figuring in India's foreign trade included cut and polished diamond/emerald, etc., pulverised barytes, steatite, felspar (cut), garnet, calcined magnesite, magnesia (fused), magnesite (dead-burnt), magnesium oxide, slate (worked), processed mica and manufactured mica products, coke, cut & polished dimension stones, alumina, etc. The manufactured mineral-based commodities included metals and alloys and products thereof, cement, firebricks and other refractory materials, clay-bonded graphite crucibles & silicon carbide crucibles, manganese dioxide, asbestos-cement products, inorganic chemicals like lime & fluorine chemicals, refined borax & borates, elemental phosphorus & phosphoric acid, titanium dioxide, petroleum products, phosphatic & potash fertilizers, etc. Table-7 provides data on contribution of various value-added minerals and mineral-based products to India's exports during 2012-13 to 2014-15.

Table – 7 : Contribution of Value-added (Processed) Minerals & Mineral-based Products in India's Export* Trade, 2012-13 to 2014-15 (P)

Sl. No.	Commodity group	Value of exports (₹ million) (P)			Contribution (percentage) (P)		
		2012-13	2013-14	2014-15 (P)	2012-13	2013-14	2014-15 (P)
1.	All Merchandise	16343188	19050110	18963484	100.00	100.00	100.00
2.	Minerals	1601012	1947835	1780766	9.80	10.22	9.39
	2.1 Raw/Unprocessed form	220153	240413	194297	1.35	1.26	1.02
	2.2. Semi-processed/ processed forms (preliminary and intermediate stages of processing)	1380859	1707422	1586469	8.45	8.96	8.37
3.	Manufactured Mineral-based Commodities (final stage of transformation)	4643372	5257330	4602389	28.41	27.60	24.27
	3.1 Metals/Alloys	1406139	1531564	1671198	8.60	8.04	8.81
	3.2 Others	3237233	3725766	2931191	19.81	19.56	15.46

Figures rounded off.
** Including re-exports.*