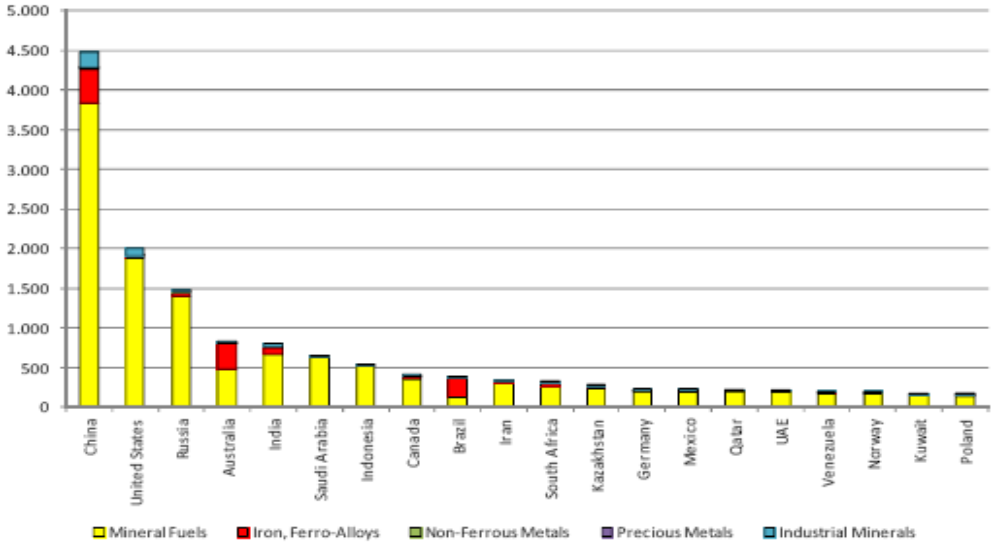
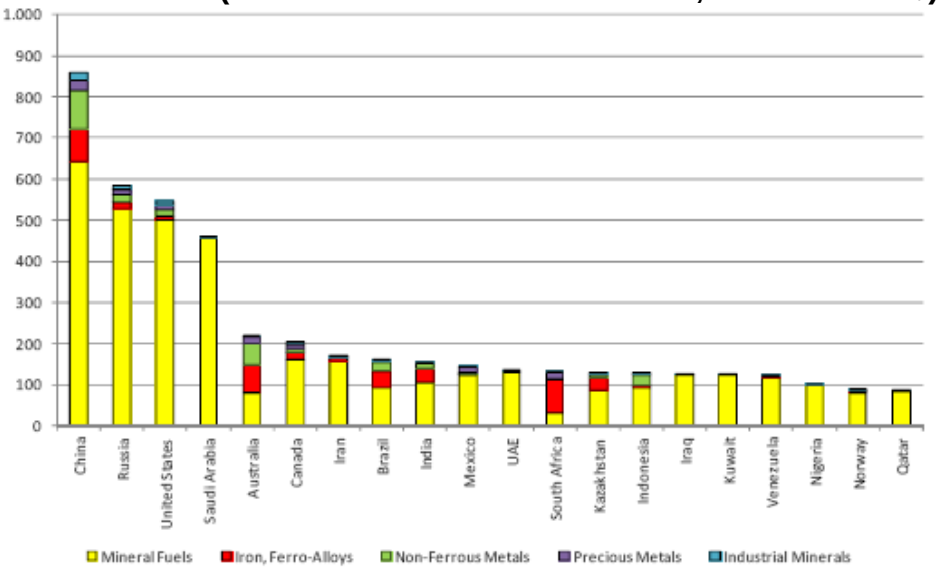
CHAPTER-15
MINING

15.1 **World scenario & India :** Minerals are valuable natural resources being finite and non renewable. Besides catering to the energy requirements of the world, they are valuable inputs for diverse industrial activities. Natural endowment of minerals increases the potential wealth of a country but their distribution across the world varies substantially. As per Report on Mineral Production by International Organizing Committee for the World Mining Congress, during 2012, India ranked 5th amongst the mineral producer countries on the basis of volume of production. However, it ranked 9th position on the basis of value of Mineral production during 2012.

Twenty largest producer countries 2012
(without construction minerals, in metric t)



Twenty largest producer countries 2012
(without construction minerals, in Billion US $)



15.2 **Significance of Mining Sector in India :** Since independence, there has been a pronounced growth in the mineral production both in terms of quantity and value. Even though performance of Indian economy is not exceedingly dependent on mining, as is the case in some middle eastern countries like Saudi Arabia , mining continues to be an important sector of Indian economy. As per NSS Reports about 2.3 million persons were employed in Mining Sector during 2011-12 and as per provisional estimates of national accounts for 2013-14 Mining with contribution of Rs 222,652 Cr (at Current prices) accounted for about 1.8 % & 2.1 % of GDP at constant and current prices respectively. Recent marginal decrease in contribution of Mining both in overall employment and GDP is on account of contraction in Mining Sector for three consecutive years.

: Employment in the Industrial Sector

	Persons employed (million)			Share in employment (%)			Share in GDP (%)		
	1999-2000	2004-2005	2009-2010	1999-2000	2004-2005	2009-2010	1999-2000	2004-2005	2009-2010
Mining	2.3	2.6	2.9	0.6	0.6	0.6	3.0	2.9	2.3
Manufacturing	43.8	56.1	52.4	11.0	12.2	11.4	15.1	15.3	16.0
Electricity	1.0	1.2	1.3	0.3	0.3	0.3	2.3	2.1	2.0
Construction	17.5	26.1	44.2	4.4	5.7	9.6	6.5	7.7	7.9
Industry	64.6	85.9	100.7	16.2	18.7	21.9	26.9	27.9	28.1

***Source* : The numbers have been derived applying NSSO segment-wise workers population ratios and Labour force participation rates to the population.**

***Note* : Employment as per usual principal and subsidiary status (UPSS) basis.**

Contribution and Rank of India in World Production of Principal Minerals & Metals, 2011

Commodity	Unit of quantity	Production		Contribution (Percentage)	India's rank in order of quantum of production
		World	India*		
Mineral Fuels					
Coal & lignite	Million tonnes	7739	582	7.5	3rd
Petroleum (crude)	Million tonnes	3980	38	1	24th
Metallic Minerals					
Bauxite	'000 tonnes	2,48,000	12,877	5.2	6th
Chromite	'000 tonnes	26,300	3,764	14.3	3rd
Iron ore	Million tonnes	3,012	167	5.5	4th
Manganese ore	'000 tonnes	47,300	2,349	5.0	6th
Industrial Minerals					
Barytes	'000 tonnes	9000	1,723	19.1	2nd
Kyanite, andalusite & sillimanite	'000 tonnes	460(w)**	62	13.5	4th
Magnesite	'000 tonnes	23,100	217	1.0	11th
Apatite & rock phosphate	'000 tonnes	2,03,000	2330	1.1	14th
Talc/steatite/pyrophyllite	'000 tonnes	7,800	1198	15.4	2nd
Mica (crude)	tonne	3,07,000	1807	0.6	15th
Metals					
Aluminium	'000 tonnes	45,200	1,654	3.7	8th
Copper (refined)	'000 tonnes	19,500	504	2.6	10th
Steel (crude/liquid)	Million tonnes	1,516	73.8@	4.8	4th
Lead (refined)	'000 tonnes	10,400	92	0.9	18th
Zinc (slab)	'000 tonnes	13,000	783	6.0	3rd

** Figures relate to 2011-12, **Mineral Commodity Summary 2012, USGS.*
@ Annual Report 2011-12, Ministry of Steel
Source: World mineral production, 2007-2011; British Geological Survey.

15.3 India produces as many as 89 minerals, which includes 4 fuel, 10 metallic, 48 non-metallic, 3 atomic and 24 minor minerals (including building and other materials) and India's ranking in 2011 as compared to world production was 2nd in barytes, and talc /steatite /pyrophyllite, 3rd in chromite, coal & lignite and zinc (slab), 4th in iron ore, kyanite/ andalusite/sillimanite and Steel (Crude), 6th in manganese ore and bauxite and 8th in aluminium.

Trends During Last Decade & Present Status:

No. of Reporting Mines:

15.4 Indian mining industry is characterized by a large number of small operational mines. Number of mines has not changed substantially over the years, because as new mines are explored, empty ones are closed down. Number of reporting mines during the last decade has been around 3000 to 3200.

The number of mines which reported mineral production (excluding minor minerals, petroleum (crude), natural gas and atomic minerals) in India was 3461 in 2013-14 as against 3694 in the previous year.

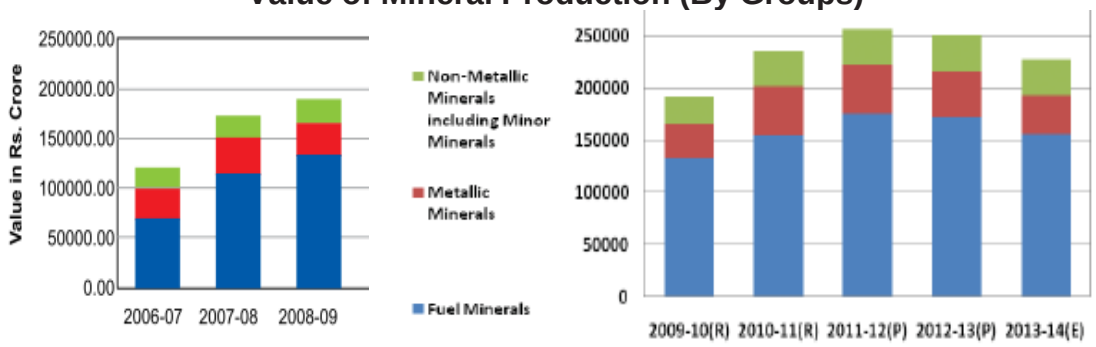
Sector	2011-12	2012-13	2013-14
All Minerals	3603	3694	3461
Coal (including lignite)	573	575	573
Metallic minerals	682	635	626
Non-metallic minerals	2348	2484	2262

15.5 **Statewise Distribution :** Out of 3461 reporting mines, 636 were located in Andhra Pradesh followed by Rajasthan (448), Gujarat (410), Madhya Pradesh (338), Tamil Nadu (315), Jharkhand (258), Karnataka (186), Chhattisgarh (195), Odisha (184), Maharashtra (154) and West Bengal (127). These 11 States together accounted for 93.93% of total number of mines in the country in 2013-14.

15.6 **Mineral Production :** During 2000-01 to 2010-11 Index of Mineral Production (Quantum Index, Base Year 1993-94=100) increased from 131 to 205 for all minerals. During the period index for fuel minerals increased from about 130 to 195, for metallic minerals from 130 to about 300 and for non metallic minerals from 142 to 259 . During the same period , index for production of iron ore increased from 135 to about 350. However the Index of Mineral Production has continuously declined since 2010-11 and was estimated to be 122.7 during the year 2013-14 as compared to 125.5 for 2012-13 showing a negative growth of 2.23%. The total value of mineral production (excluding atomic minerals) during 2013-14 has been estimated at Rs 2,27,176 crore, which shows a decrease of about 9.32% over that of the previous year. During 2013-14, estimated value for fuel minerals account for Rs 1,55,646 crore or 68.51%, metallic minerals, Rs 37,213 crore or 16.39% of the total value and non-metallic minerals including minor minerals Rs 34,317 crore or 15.10% of the total value.

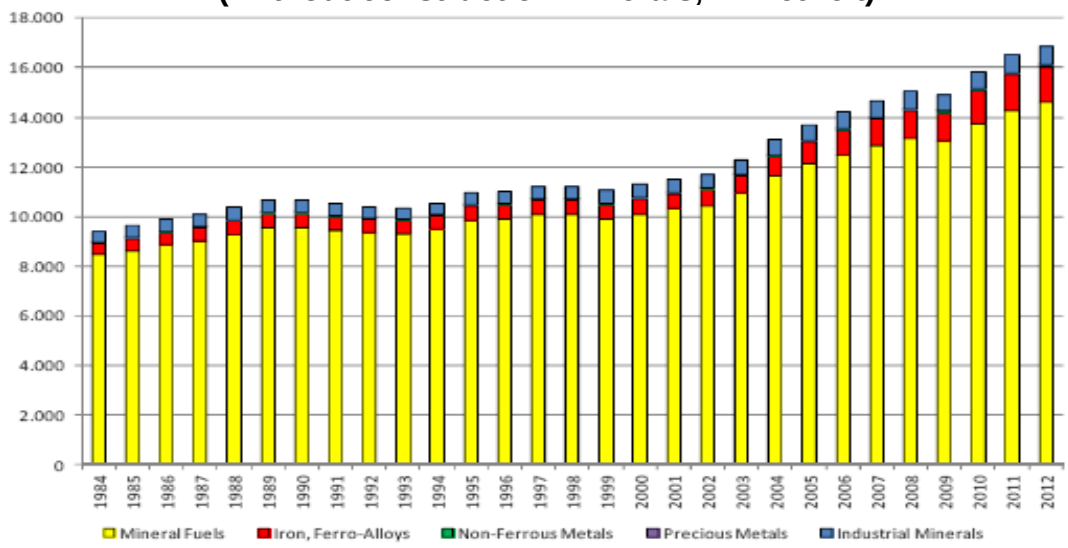
15.7 On the basis of significance in terms of production value , fuel minerals were given weight of 857, metallic minerals 80, non metallic minerals 42 & minor minerals weight of about 20 for construction of the index (Base Year 1993-94). The relative importance seems to continue as reflected by the production over the years, though the share of metallic & non metallic minerals has increased and new base year 2004-05 has the weights of 812, 104, 27 and 26 for fuel metallic, non metallic and minor minerals respectively .

Value of Mineral Production (By Groups)



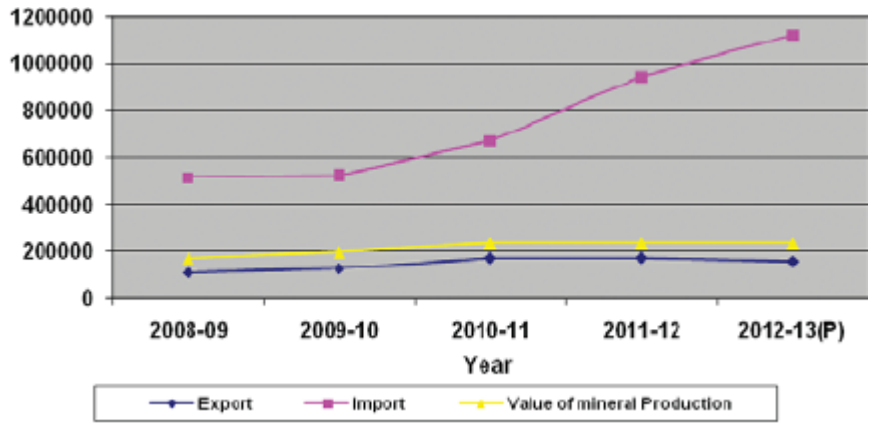
15.8 Similar feature is reflected in the overall world mineral production also where mineral fuels have primacy with much less share of metallic & non metallic minerals, whose share continues to be less despite of increase over the years.

World Mining production 1984-2012 by groups of minerals (without construction minerals, in metric t)



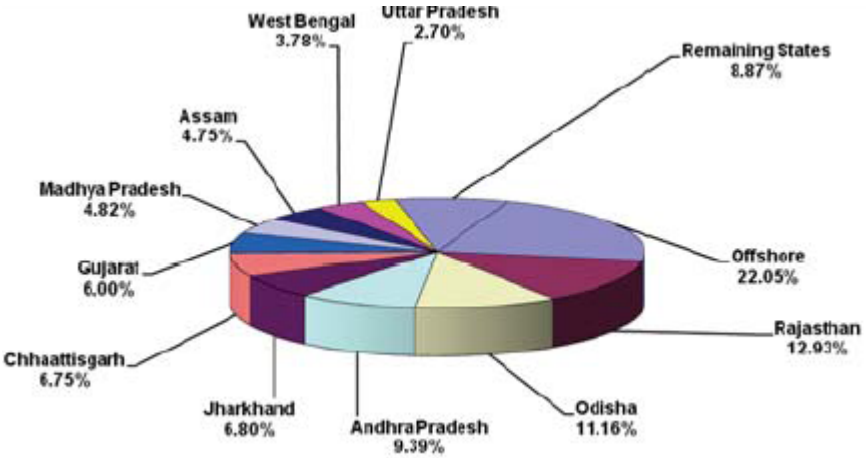
15.9 **Imports & Exports** : Even though India continues to be largely self sufficient in minerals which constitute primary mineral raw material to industries like iron ore, ferro alloys , aluminium , cement etc and mineral fuels like coal (except low ash coking coal) etc. , its value of imports still far exceeds its production .But the high value of imports is largely due to only two minerals viz. crude petroleum & diamond . Together they accounted for about 83 per cent of the import during 2012-13. Petroleum (accounting for about 72 % of import value) is essential to meet the energy requirements whereas the import of raw diamond is for value added re-exports. Exports of Minerals during 2012-13 declined to Rs 1,59,747 Cr from Rs 1,75,310 Cr during the previous year whereas the value of imports increased to Rs 11,24,137 Cr from Rs 9,44,430 Cr during the period.

Trends of Value of Mineral Production, Exports & Imports (Rs Crores)



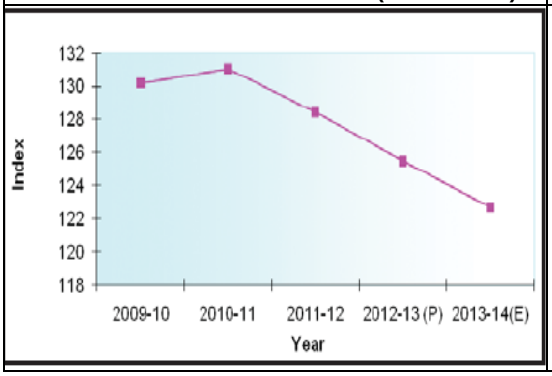
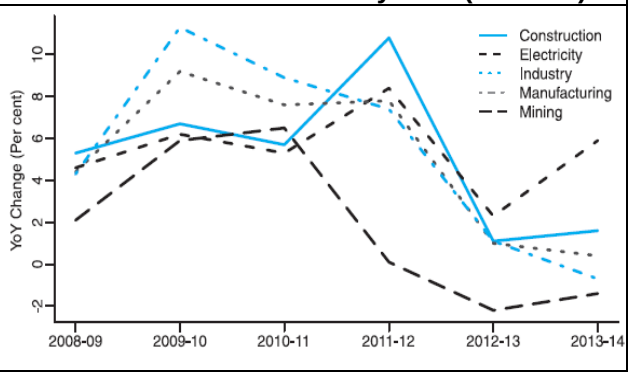
15.10 **Statewise Distribution :** During 2013-14, Mineral production was reported from 32 States/Union Territories (actual reporting of MCDR & Fuel minerals from 22 states and estimation of minor minerals for all 31 States/Union Territories) of which the bulk of value of mineral production of about 91.41% was confined to 12 States (including off shore areas) only. Offshore areas were in leading position, in terms of estimated value of mineral production in the country it and had the share of 22.05% in the national output. Next in order was Rajasthan with a share of 12.93% in the total value of mineral production followed by Odisha (11.16%), Andhra Pradesh (9.39%), Chhattisgarh (6.75%), Jharkhand (6.80%), Gujarat (6.00%),Madhya Pradesh(4.82%), Assam (4.75%), West Bengal (3.78%), and Uttar Pradesh (2.70%). Remaining 21 States and Union Territories having individual share of less than 2.7% all together accounted for remaining of total value

Share of States in Value of Mineral Production 2013-14 (Estimated)



Recent Contraction in Mining Sector:

15.11 Mining sector output contracted for the third successive year in 2013-14, declining by 0.6 per cent. Of the total value of mineral production (excluding atomic and minor minerals) in the country, the estimated contribution of coal and lignite, crude petroleum, iron ore, and natural gas (utilized) is about 92 per cent. Contraction in mineral index in the past three years has been mainly on account of lower or moderate production in all the major minerals. Mining sector GDP declined by 1.4 per cent in 2013-14. The underlying cause of the poor performance in Mining & Manufacturing has been considerable deceleration in investment particularly by the private corporate sector during 2011-12 and 2012-13, a trend that appears to be continuing as the overall gross fixed capital formation (GFCF) has further declined during 2013-14

Index of Mineral Production (2004-05=100)	**Sectorwise Growth of Industry GDP (Per cent)**
	

15.12 Coal contributes about 41 per cent of total mining sector output and its production growth has remained below-expectation during 2013-14 due to structural issues. Natural gas production has plummeted mainly due to declining production from the KG-6 basin. Output of iron ore declined in some parts following a court order. Iron ore mining has again been permitted but global prices of iron ore have declined significantly from the peak of 2011.

15.13 The Index of Industrial Production of Mining registered a decline of 0.8 percent during 2013-14 . Production of coal and crude oil registered growth rates of 0.8 percent and (-) 0.2 percent in 2013-14 The growth of 'mining &quarrying' was estimated at (-) 1.4 Percent.

15.14 Amongst mineral rich states , state-wise analysis revealed that during the year 2012-13, the value of mineral production in most of the mineral producing States have shown a mixed trend. The States which have indicated decrease in the value of mineral production over previous year are Chhattisgarh (-5%), Gujarat(-5.5%) & Goa (-62%) whereas Rajasthan with 23% increase led amongst the States which saw an increase , followed by MP and Karnataka which saw about 7 % increase. Tamil Nadu with 4% increase, Odisha & Andhra each with increase of 3%, Jharkhand with 1.3 % increase and Maharashtra with 0.4 % increase in value of mineral production during 2012-13 were other mineral rich

states that saw an increase in production value of minerals(including fuel and minor minerals).

Sources of Data :

15.15 **Indian Bureau of Mines (IBM)**, a subordinate office of Ministry of Mines, is the principal government agency responsible for compiling exploration data and mineral maps and for providing access to the latest information in respect of mineral resources in respect of **Major Minerals under Mineral Conservation & Development Rules, MCDR 1988**. Besides statistical activities, IBM offers technical expertise and proven experience in the fields of geology, mine planning and feasibility studies. The geological services of IBM include survey and preparation of mine plans, preparation of geological plans, preliminary geological appraisal of mineral properties, including the formulation of an initial scheme of detailed exploration with estimate of cost and preliminary reconnaissance, quick survey to determine potential areas out of large properties etc.

15.16 Amongst the mineral fuels , information on Coal & lignite production is obtained from **Office of Coal Controller**, Kolkata whereas that for production of petroleum & natural gas is obtainer from **Ministry of Petroleum & Natural Gas**.

(The Ministry of Mines is responsible for the survey and exploration of all minerals (other than Natural Gas and Petroleum), for mining and metallurgy of Non-ferrous metals like Aluminum, Copper, Zinc, Lead, Gold, Nickel, etc., and for the administration of the Mines and Minerals, other than Coal, Natural Gas and Petroleum. **Geological Survey of India, GSI**, another subordinate office of Ministry of Mines, helps through assessment of geological and regional mineral resources of the country through scientific surveys and research and for locating mineral resources & geological mapping. **Mineral Exploration Corporation Limited MECL** is a public sector company, which undertakes detailed exploration of various minerals / ores by drilling and exploratory mining. It is also engaged in proving the existence of reserves for their eventual exploitation. Exploration is taken up both on a promotional basis on behalf of the Government of India and on contractual basis for other agencies)

Acts & Rules Governing Mining Sector :

15.17 **The Mines and Minerals Development and Regulation Act, 1957, ('MMDR'**) and the **Mines Act, 1952,** together with the rules and regulations framed under them, constitute the basic laws governing the mining sector in India. The relevant rules in force under the MMDR Act are the **Mineral Concession Rules, 1960,** and the **Mineral Conservation and Development Rules, 1988**. The health and safety of the workers is governed by the **Mines Rules, 1955** created under the jurisdiction of the Mines Act, 1952.

15.18 The Mineral Concession Rules, 1960 outline the procedures and conditions for obtaining a Prospecting License or Mining Lease. The Mineral Conservation and Development Rules, 1988 lays down guidelines for ensuring mining on a scientific basis, while at the same time, conserving the environment. The provisions of Mineral Concession Rules and Mineral Conservation and Development Rules are, however, not applicable to coal, atomic minerals and minor minerals. The minor minerals are separately notified and come under the purview of the State Governments. The State Governments have for this purpose formulated the Minor Mineral Concession Rules.

15.19 **Issues with Mining Sector :** Mining, unless properly regulated, can have adverse environmental and social consequences. On the one hand, mining disturbs the soil, water and ecological regimes and on the other hand, unless accompanied by proactive measures to promote inclusiveness through social education, health and other interventions, it can lead to alienation of the local population and assume socially unacceptable dimensions. Issues of Technology for zero waste or low waste mining, relief & rehabilitation, mine closure which otherwise leads to land degradation are important issues which require continuous attention.

References :

- Economic Survey India 2013-14
- Annual Report 2013-14, Ministry of Mines
- World Mining Data 2014, G Zsak, C. Reichl , M Schatz – International Organizing Committee for the World Mining Congress.