

# IMPACT ASSESSMENT OF MINERAL RESOURCE IN CHHATTISGARH

**Dr. C.R Ratre\*, Vinay Kumar Ratre, M.Com M. Lib**

\*Technical Officer

School of Studies in Geography

Pt. Ravishankar Shukla University Raipur, Raipur Chhattisgarh, India

## Abstract

Chhattisgarh is quite rich in mineral resources. There are found huge reserves of coal in the northern upland, limestone (cement grade) in the central plain and around Jagdalpur and iron ore in the southern upland. The coalfields or Surguja, Koriya, Korba and Raigarh districts contain Coal reserves to the extent of 54,912 million tons. The total estimated reserve of Limestone in the state is 8,959 million tons. The Iron Ore deposits occur in the Dalli-Rajhara hills of Durg district, and Raoghat and Bailadila hills of Bastar region. After exploitation of a large quantity, the existing reserves of iron ore amount to 4031 million tons in the state. While the iron ore of Dalli-Rajhara mines is being used in the Bhilai Steel Plant, a large quantity of the Bailadiala reserves has been exploited for export to Japan. The Raoghat reserves are waiting for development. Other important minerals of the region are dolomite, bauxite, fireclay, tin, alexandrite, garnet, corundum, diamond, etc. Chhattisgarh earns about 27 percent revenue from extraction of mineral. It cost 19566.01 crore in 2014-15. Coal and iron ore are the major source of it. These mineral resources form the basis of location of a number of industries in the state. The location of six thermal power plants at Korba with installed capacity of 200, 240, 500, 840, 1000 and 21000 MW is the Impact of these reserves. Availability of cheap electricity has caused establishment of a big aluminium factory (BALCO) at Korba. Availability of cement grade limestone extensively and in large quantity has caused establishment of a number of cement factories in the State.

*IndexTerms – Chhattisgarh, Mineral Resource, Impact Assessment, Revenue, Industries.*

## Introduction

Chhattisgarh is rich in minerals like coal, iron ore, and bauxite, driving its economic growth and industrialization. Mining generates revenue and supports key industries such as steel and power. This paper examines the distribution of mineral resources, their extraction, and their impact on the state's economy and industrial development.

## Objective

The present paper focuses on the distribution of mineral deposits, and reserves in Chhattisgarh, their extraction and earning of revenue as well as their impact on the economy of Chhattisgarh in the form of industrialization and their Prospects.

## Data and Methodology

The Study is based on secondary data obtained from the government records of Chhattisgarh and website of Indian Mineral Yearbook: Indian Bureau of Mines, Government of India, 2013 , Annual Report : Ministry of Mines, Government of India, 2014-15. The obtained data has been analyzed. The percentage method has been used in the analysis.

## Study Area

Chhattisgarh, the 26<sup>th</sup> state of the Indian Union, came into existence on November 1, 2000. It was created by carving out seven eastern districts of Madhya Pradesh state, namely Surguja, Raigarh, Bilaspur, Raipur, Durg, Rajnandgaon and Bastar. Since the districts were of quite large size, they have been divided and reorganised into twenty seven districts for administrative convenience. At the time of 2011 Census, the number of districts was eighteen. The state covers an area of 135,191 km<sup>2</sup> between 17<sup>o</sup> 46' and 24<sup>o</sup> 6' N and 80<sup>o</sup> 15' and 84<sup>o</sup> 24' E. It is larger in size than many states of the country. Mumbai-Kolkata National Highway (No.53) and South Eastern Central Railway traverse the state through its heart.

## Mineral Resources

Bountiful nature has bestowed Chhattisgarh with vast resources of all important minerals. One of the rarest gemstone Alexandrite is found in Raipur and workable deposits of Corundum are widespread in southern Chhattisgarh. Diamondiferous Kimberlite in Mainpur, Gold in Sonakhan, iron ore in Kawardha District.

Chhattisgarh is the most significant State regarding mineral deposits with a variety of mineral resources including mineral ores, abrasives and gemstones, fuel, industrial and building materials. The mineral deposits of the state are the result of the different weathering processes on the Archean rocks and the formation of different rocks containing valuable mineral deposits of varying geological ages, exposed to the surface. The exposed rocks are igneous, sedimentary and metamorphic type. The igneous rocks are of two types (a) intrusive- granite, granodiorites and pegmatite, (b) effusive variety basalt and associated lower occur in small patches. Sedimentary rocks are of two types - Unconsolidated and Consolidated. The metamorphic group includes quartzite, slate and schist.

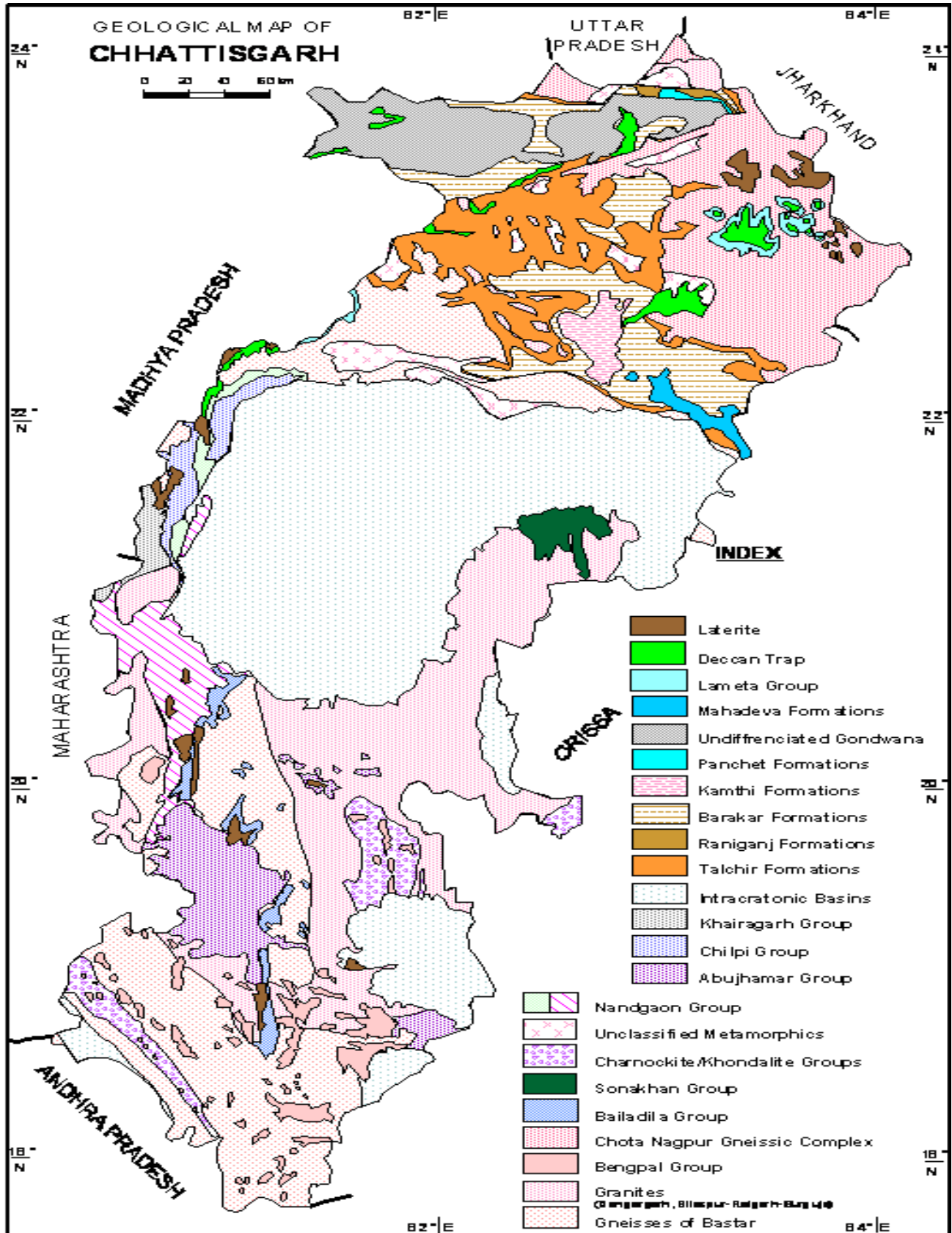
## Iron ore

Chhattisgarh has vast deposits of iron ore which is the most important of mineral occurrences of the Region. Iron ore deposits of Chhattisgarh are associated with the rocks that are world over known to contain high-grade ores (Hematite) i.e. Banded Iron Formation. These rocks are forming almost North-South trending narrow, highly dissected and discontinuous hill ranges of about 370 km in length that are extending from Bailadilla to Rajhara in southwestern Chhattisgarh occupying Dantewara, Bastar, Kanker, Narainpur, Rajnandgaon, Durg and Kabirdham districts. Bailadilla iron ore deposits located in southern part of the range are world-class and being mined from the leased area to National Mineral Development Corporation, Ltd. (NMDC). Iron ore of Dalli-Rajhara located in the central parts of the range are captive mines of Bhilai Steel Plant (BSP).

The iron ore deposits occur in the Dalli-Rajhara hills of Durg district, and Raoghat and Bailadilla hills of Bastar region. After exploitation of a large quantity, the existing reserves of iron ore amount to 2089 million tons in the state. While the iron ore of Dalli-Rajhara mines is being used in the Bhilai Steel Plant, a large quantity of the Bailadilla reserves has been exploited for export to Japan. The Raoghat reserves are waiting for development. Other important minerals of the region are dolomite, bauxite, fireclay, tin, alexandrite, garnet, corundum, diamond, etc.

Recently an iron ore bearing area is discovered in Kabirdham district and known as Eklama iron ore complex. This area is expected to yield high-grade hematitic iron ore in substantial quantity and support iron & steel units. Part of Bailadilla and Dalli-Rajhara areas are being actively mined by NMDC and BSP respectively. At a few places, small deposits (including isolated patches) may be related to other geological phenomenon are also known, which may not be economical for large establishment mine production. However, they can be used for sponge iron units.

Courtesy-directorate of geology and mining, Raipur, Chhattisgarh

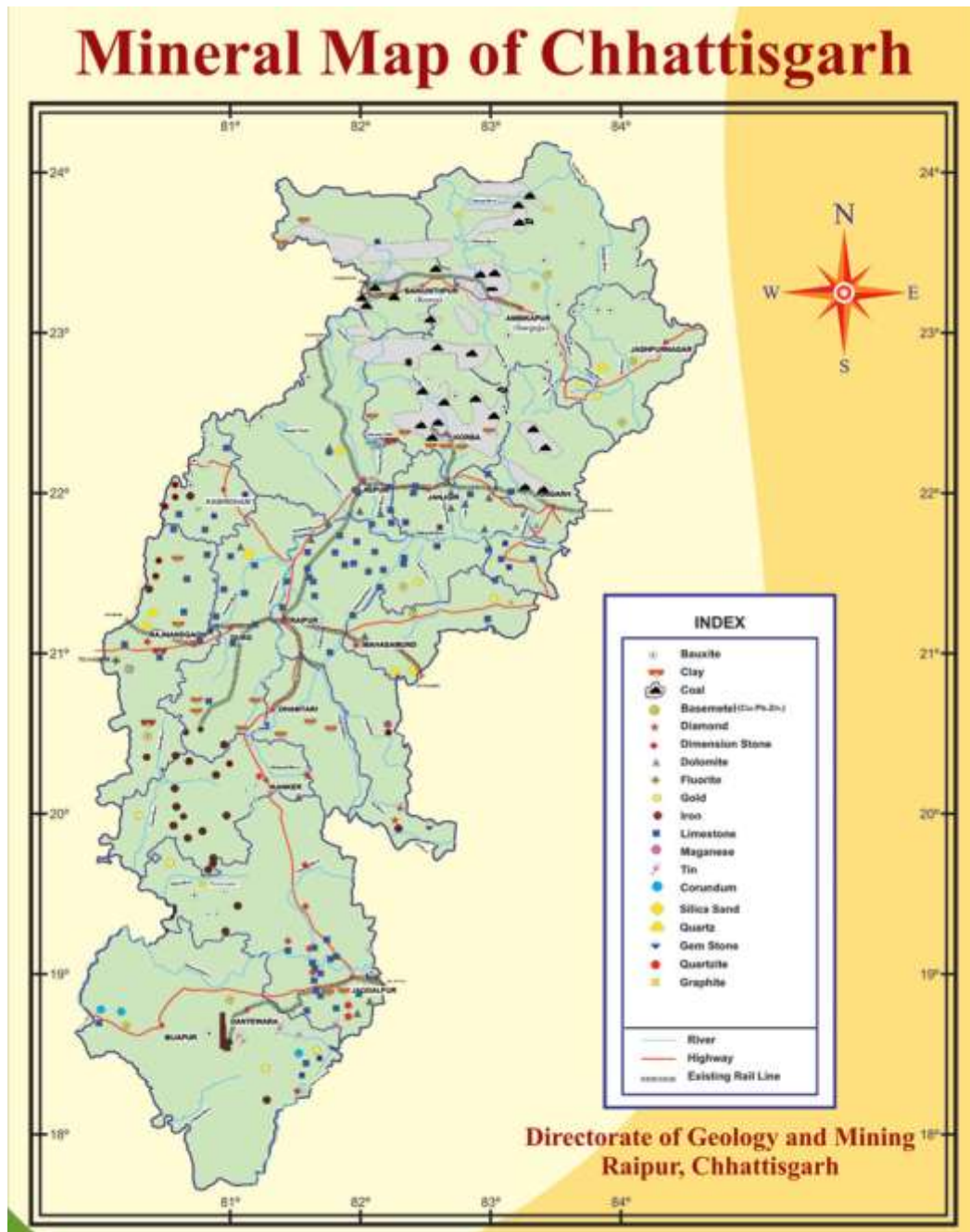


**Table No. 1**

**Chhattisgarh: District wise Mineral Deposits**

S.No.	District	Mineral
1	Raipur	Limestone
2	Balodabazar	Limestone, Dolomite and Gold Ore
3	Gariyaband	Garnet, Diamond, Alexandrite (Iron Ore and Magnese in low Quantity)
4	Dhamtari	Clay and Uget
5	Mahasamund	Gold Ore, Quartzite, Iron Ore, Lime stone ( Glass and fluorite)
6	Rajnandgaon	Lime stone, Iron ore, Fluorite, Clay, Quartz/Silica Sand(Gold Ore and Glass in low Quantity)
7	Kabirdham	Bauxite, Lime stone, Iron Ore, Sop stone (Occur in low Quantity)
8	Durg	Limestone
9	Balod	Iron Ore
10	Bemetara	Limestone, Dolomite, Quartzite (Red Occur in low Quantity)
11	Bastar	Limestone, Dolomite , Quartzite and Bauxite
12	Narayanpur	Iron Ore
13	Sukma	Quartz, Limestone, Tin, Corundum, (Galena, Sillimanite and Baril in low Quantity)
14	Kanker	Iron Ore, Bauxite (Gold and Quartz in low Quantity)
15	Kondagaon	Bauxite
16	Dantewara	Iron ore, Tin ore (Lepidolite, Galena and Quartz in low Quantity)
17	Bijapur	Corundum, Bauxite (Garnet and Copper ore in low Quantity)
18	Bilaspur	Limestone and Dolomite
19	Mungeli	Limestone and Quartz
20	Korba	Bauxite, Coal (Mica and Fire Clay in low Quantity)
21	Janjgir	Limestone and Dolomite
22	Raigarh	Coal, Dolomite, Limestone and Quartzite
23	Jashpur	Gold Ore, Bauxite ( Barill and Garnet in low Quantity)
24	Sarguja	Bauxite ( Lead, Mica and Limestone in low Quantity)
25	Balrampur	Coal, Bauxite ( Graphite and Asbestos in low Quantity)
26	Surajpur	Coal (Mica and Fire Clay in low Quantity)
27	Koriya	Coal

Source- Directorate of Geology and Mining, Raipur, Chhattisgarh



Courtesy- Directorate of Geology and Mining, Raipur, Chhattisgarh.

### Coal

The state has 16% of the total coal deposits of India. 44483 million tons coal has been estimated in 12 coalfields of the State located in Raigarh, Surguja, Koriya and Korba districts. The state ranks 2nd in coal production by contributing over 18% to the total national production. Most of the coal deposits are of power grade coal. NTPC & CSEB in Korba are the major producer of thermal power and now a plant of NTPC has been started in Seepat, Bilaspur. Potential for more power generation units exist in the State.

New capacities of 10,000 MW are expected to materialize by 2011. Govt. Of India, Ministry of coal have thrown open several coal blocks for captive use in private sector JV 28 such blocks tall within the state Chhattisgarh which have been allowed to various companies.

## Bauxite

Chhattisgarh mainly comprises metal (B & C) and refractory grade (A) bauxite, located in Surguja, Korba, Jashpur, Kanker, Bastar and Kabirdham districts. Total estimated reserves of all grades are of the tune of 148 million tons. Bauxite exploitation in the State is reserved for Public Sector Undertaking either singly or through JVC working. In Surguja District - Mainpat, Samripat and Jamirapat Bauxite is widely developed in the form of pockets and lenses Within Extensive Laterite Over the Deccan Basaltic Plateau. In Jashpur District - Pandrapat plateau is capped by laterite, over the Deccan basaltic flows containing Bauxite in the form of pockets and lenses of various dimensions. In Kanker District - Bauxite is developed in the form of pockets and lenses on small plateaus of varying dimensions in Keshkal area. It figures within the extensively developed laterite over the Bahmani sandstone, forming capping over hilly terrain of granite. Bauxite of this area belongs to A and B grade and may be considered as refractory grade. In Kabirdham District - Bauxite is known in and around villages Bodai Daldali, Keshmarda, Rabda, Mundadadar and Samsetta. A total reserve of 6.12 million tones of metal grade bauxite is expected from the area. The area is leased out to BALCO. Over 11 million tons of metal grade bauxite is expected from 25 localities. A small bauxite pocket has been discovered in Asna - Tarapur area of Bastar district.

## Limestone and Dolomite

Limestone and Dolomite are the carbonate rocks that are mainly used for cement manufacture and metallurgical purposes with other allied uses of calcinations, flux, refractory bricks, dimension stones etc. based on the grade. These sedimentary rocks are precipitated in identical environment to form widespread and continuous deposits. Limestone comprises of high calcium carbonate, while Dolomite is a double carbonate with higher concentrations of magnesium carbonate (>19% MgO) and calcium carbonate (20~35% CaO). Limestone and dolomite deposits are located in Raigarh, Janjgir-Champa, Kabirdham, Bilaspur, Raipur, Durg, Rajnandgaon districts forming part of Chhattisgarh basin and in Jagdalpur district within Indravati basin and in Dantewara district in Sukma basin. Total estimated deposits of all grades of limestone are of the tune of about 9038 million tones and estimated reserves of dolomite are of the tune of 847 million tones as per Indian Bureau of Mines.

## Tin

Chhattisgarh is the only tin producing State in India. Tin ore is known as cassiterite, which was reported in Dantewara district by the Directorate of Geology and Mining associated with the lepidolite bearing pegmatites. Cassiterite bearing pegmatites are reportedly rich in columbite and tantalite, which are ore of rare metals niobium and tantalum, respectively. Lepidolite is also a source of rare alkali metals namely lithium (Li <2.15%) cesium (Cs <0.83%) and rubidium (Rb <5.9%).

## Corundum

In Chhattisgarh corundum occurs in Bhopalpatnam and Sukma areas of Dantewara/Bijapur districts. Minor occurrences are also reported from Deobhog area of Raipur district. Total 48 tons of corundum has been estimated in the State. The Corundum deposits are found in Kuchnoor, Ulloor, Dampaya, Dhangal, Chikudapalli, Yapla and Sonkukanar, Sukma area.

## Diamond

Incidences of diamond in the rivers of the State and discovery of diamondiferous kimberlite in Mainpur area of Raipur district have attracted global attention. So far six kimberlites in Mainpur area and two kimberlites in Tokapal area have been discovered. The State has emerged as a hotspot for potential diamond mining with all major mining companies engaged in reconnaissance operations.

## Other Gem Stones

A rare gem mineral like Alexandrite is found in the State. Other gemstones like Garnet, Beryl, Rosy quartz, amethyst etc are also reported. Based on the mineral's strength of the State, Gems and Jewelry Park is planned near Raipur.

## Dimension Stones

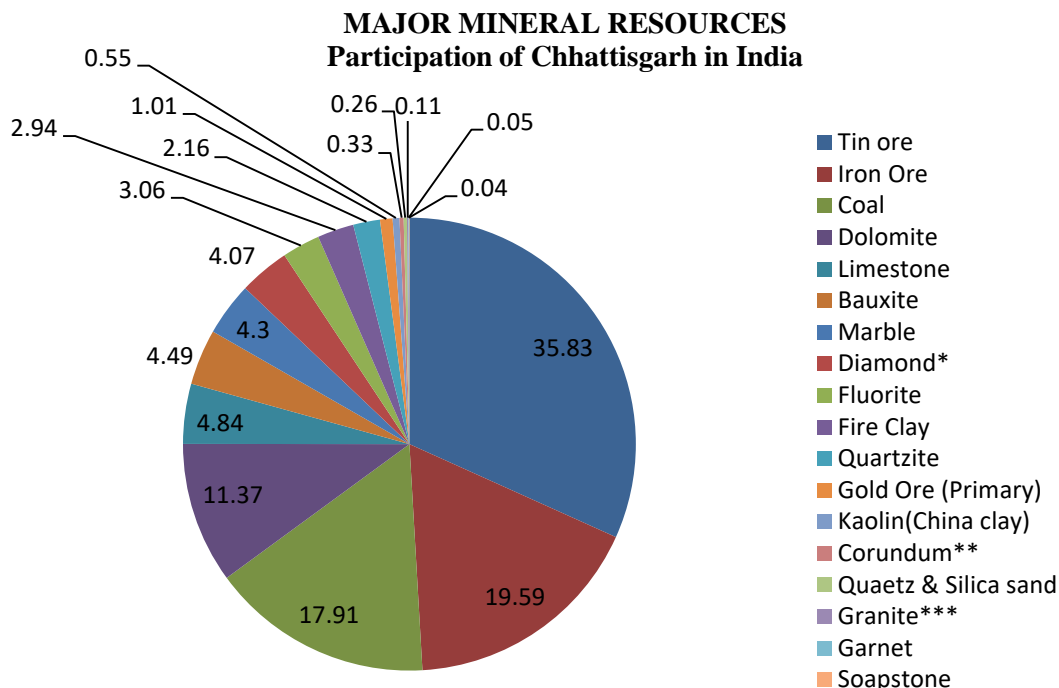
Multicolored and texturally different granites are widely distributed in the State. Limestone, dolomite of attractive colour and design are extensively available in the State. Quartzite, sandstone and shales are also widely exposed which can be suitable as dimension stone. Export oriented cutting and polishing units are working in the State and prospects for many more exist.

## Gold

Potentially gold bearing rocks are available in Raipur and Mahasamund districts. Placer gold panning is widely recorded from Jashpur, Kanker, Mahasamund and Bastar districts. ~3 tons of gold reserves are estimated in the State. Global mining companies like ACC Rio Tinto and Geomysore Services Pvt. Ltd., etc. are engaged in reconnaissance and prospecting operations for gold deposits in the State.

## Base Metals

Potential base metals like copper, lead indications are known from Rajnandgaon, Mahasamund and Dantewara districts. These metals can be used in electric wires, batteries, manufacture of pigments, alloys etc. Other minerals like clays, quartzite, fluorite, alexandrite andalusite, kyanite, sillimanite, talc, soapstone, steatite, marble, silica sand, etc. are also reported from various part of the States.



**Fig No. 3 ble No. 2**  
**Major Mineral Resources of Chhattisgarh**  
 Up to 01-4-2013

S. No.	Mineral	Total Resources In India ( Million Ton)	Total Resources in Chhattisgarh (Million Ton)	Percentage of Chhattisgarh in the Country
1	Coal	306596	54912	17.91
2	Iron Ore	20575	4031	19.59
3	Limestone	184935	8959	4.84
4	Dolomite	8085	919	11.37
5	Bauxite	3739	168	4.49
6	Tin ore	83.72	30	35.83
7	Quartzite	1251	27	2.16
8	Quartz & Silica sand	3499	9	0.26
9	Fluorite	18	0.55	3.06
10	Fire Clay	714	21	2.94
11	Kaolin(China clay)	2705	15	0.55
12	Gold Ore (Primary)	494	5	1.01
13	Garnet	57	0.03	0.05
14	Soapstone	269	0.11	0.04
15	Marble	1931	83	4.3
16	Diamond*	319	13	4.07
17	Corundum**	267816	885	0.33
18	Granite***	46230	50	0.11
		849316.72	70127.69	8.26

\*Lakh Carat, \*\* Tonn, \*\*\* Lakh cubic mts.

Source: Indian Mineral Year Book as on 01.4.2013

The participation of Chhattisgarh in India in terms of Mineral resources is 8.26%. It ranges between 35.83% (Tin Ore) to 0.04% (Talc/Steatite, Soapstone). In Chhattisgarh 18 Minerals are found most important amongst them are Tin Ore, Iron Ore, Coal and Dolomite. These minerals have their participation of more than 10% in India. Next come Limestone. Bauxite, Marble, Diamond, Fluorite, Fire Clay, Quartzite and Gold with their participation ranging between 4.84% to 1.01% respectively. Some other Minerals like China Clay, Corundum, Quartz and Silica Sand, Granite, Garnet and Soapstone are rarely found and their participation in the Country is negligible (below 0.55%) Table No.2 and Fig.No.3, highlight the above facts.

### Production

The records of yearly production of Major Minerals during 2010-11 to 2014-15 an increase in production of coal, Bauxite, Limestone and Tin is observed except for the year 2012-13. The production of Iron Ore decreased in 2012-13 and 2014-15, but increased in 2013-14. The production of Bauxite has decreased in 2012-13 and 2013-14 but increased in 2014-15. While the production of Dolomite has a continuous increase during last four years. (Table No. 3, Figure No. 4)

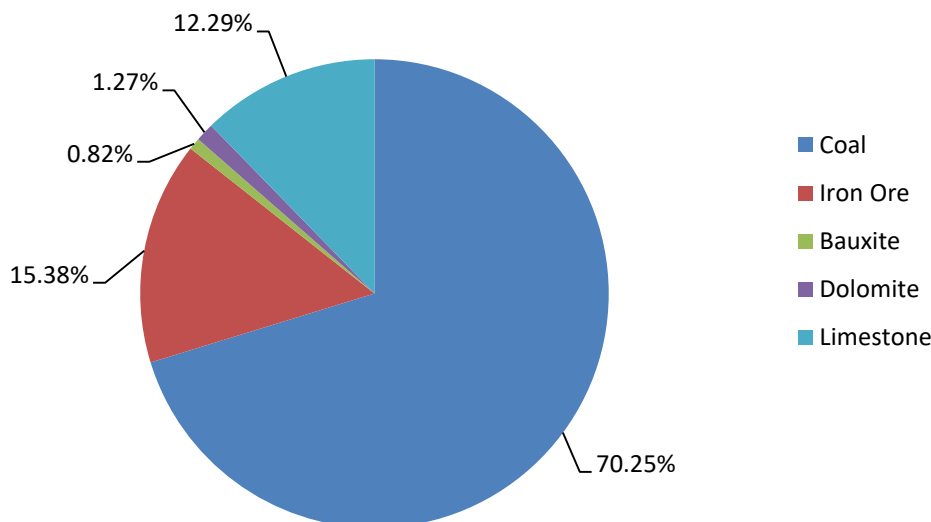
**Table No.3**

**Chhattisgarh : Year wise Production of Major Minerals ( Quantity in Lakh Ton)**

Major Mineral	Year				
	2010-11	2011-12	2012-13	2013-14	2014-15
Coal	1138.24	1193.58	1178.3	1270.93	1343.96
Iron Ore	293.2	304.57	279.63	301.56	294.18
Bauxite	21.1	23.92	18.18	13.14	15.66
Dolomite	15.93	16.25	19.7	25.95	24.38
Limestone	192.41	204.65	201.72	210.61	235.05
Tin (Concentrate) *	60643	48765	47774	34851	32500.00

\* In Kilogram

### Chhattisgarh Production of Major Minerals (2014-15)



**Fig No. 4**

### Production Value

In terms of estimated value of mineral production, Chhattisgarh stands 4<sup>th</sup> in the India with a share of 7.48%. It has got III<sup>rd</sup> rank in the nation in terms of increase in Royalty collection with 46.77%. The production value of minerals of Chhattisgarh was 7.9% in 2012-13 which increased to 8.7% in 2013-14 but decreased in 2014-15 to 8.2%. The Year wise production value figures show that it shares 8% in National Mineral Production Value. (Table No. 4, Figure No. 5)

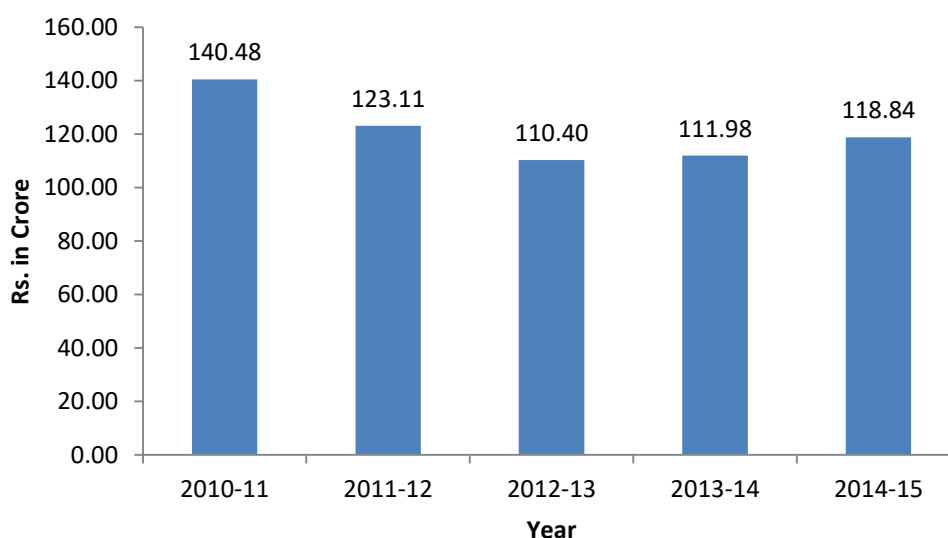
**Table No. 4**

### Chhattisgarh : Year wise Production Value of Major Minerals ( Rs. in Crore)

Major Mineral	Year				
	2010-11	2011-12	2012-13	2013-14	2014-15
Coal	5825.62	7074.03	9075.07	9788.49	19413.34
Iron Ore	7171.21	9874.15	8773.95	9203.67	9295.84
Bauxite	77.73	144.46	111.75	79.4	104.88
Dolomite	36.36	36.38	57.35	89.73	82.59
Limestone	299.78	347.77	375.25	398.1	488.26
Tin (Concentrate) *	2.78	2.61	2.5	2.27	1.52
Total	13413.48	17479.4	18395.87	19561.66	19416.43

\* In Kilogram

**Chhattisgarh Yearwise Production Value of Major Minerals**



**Fig No. 5**

### Revenue

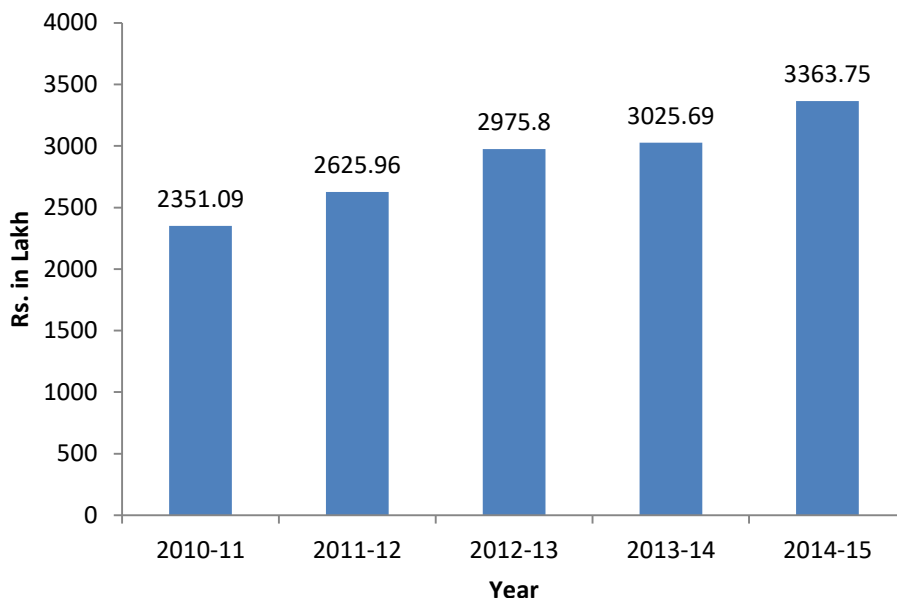
Chhattisgarh earns about 27% revenue from extraction of Minerals. It costs Rs. 19416.43 crore in 2014-15. The maximum Revenue is earned from Coal and Iron Ore. In spite of increase in Coal production, the revenue gain is low in 2014-15 while the income from Iron Ore is increased due to 50% increase in Royalty rate of Iron Ore. The data regarding the year wise Royalty receipt of Major Minerals show the continuous increase in Dolomite and Limestone while it fell down for Coal in 2014-15. For Iron Ore and Bauxite there was a fall in Royalty gain in 2012-13 and 2013-14 ( Table No. 5, Figure No. 6).

**Table No. 5**

**Chhattisgarh : Year wise Royalty Receipt of Major Minerals ( Rs. in Crore)**

Major Mineral	Year				
	2010-11	2011-12	2012-13	2013-14	2014-15
Coal	1157.75	1282.17	1764.64	1886.23	1808.2
Iron Ore	1031.49	1170.68	1045.4	958.57	1336.99
Bauxite	26.03	32.8	23.18	20.26	25.49
Dolomite	11.35	12.22	13.74	19.03	22.27
Limestone	124.47	128.09	128.84	141.6	170.8
Total	2351.09	2625.96	2975.8	3025.69	3363.75

### Chhattisgarh Yearwise Mineral Revenue



**Fig. No. 6**

The district wise Total Mineral Revenue receipt during 2010-11 to 2014-15 shows a continuous increase in revenue receipt of Chhattisgarh ranging between Rs. 246146 lakh in 2010-11 to Rs. 357268 lakhs in 2014-15 (Table No. 6). In the year 2014-15, the maximum revenue was generated from Korba District. (Rs.1,03,388 lakh), followed by Dantewara, Balod, Raigarh, Korba, Balodabazar, Surajpur, Surguja, Janjgir, Balrampur, Raipur, Bilaspur and Rajnandgaon respectively. The rest of the Districts are having revenue below 2000 lakhs. (Fig. No. 7)

**Table No. 6**

### Chhattisgarh : District wise Mineral Revenue

District		2010-11	2011-12	2012-13	2013-14	2014-15
1	Raipur	12682	12806.2	4136.26	4203.95	4568.28
2	Balodabazar	0	0	9280.85	11556.6	13803.3
3	Gariyaband	0	0	186.75	169.03	259.49
4	Dhamtari	227.13	243.51	334.23	446.2	379.19
5	Mahasamund	322.01	169.14	373.51	780.34	1109.82
6	Rajnandgaon	1061.98	605.15	666.69	1075.06	2041.53
7	Kabirdham	1107.63	1487.04	1318.59	1471.34	1988.97
8	Durg	27399.8	30969.4	2066.23	2502.5	2714.02
9	Balod	0	0	31722.1	26758.5	36367.3
10	Bemetara	0	0	192.12	325.3	379.63
11	Bastar	745.19	685.66	912.68	855.1	897.54
12	Narayanpur	13.01	3.81	24.01	29.32	33.32
13	Sukma	0	0	3.78	12.09	19.58

14	Kanker	2619.96	1723.81	4596.1	1892.89	1857.98
15	Kondagaon	0	0	201.84	296.82	170.83
16	Dantewara	74917.4	86823.7	68519.5	68678.4	95532.8
17	Bijapur	18.89	11.3	14.23	14.81	35.54
18	Bilaspur	1692.81	1632.36	1789.58	2608.63	2770.13
19	Mungeli	0	0	204.17	367.87	335.16
20	Korba	74996	78351.7	106647	114911	103388
21	Janjgir	3149.27	3419.85	3901.99	4433.57	4988.95
22	Raigarh	18798.6	21797.6	26894.7	27178.6	32884
23	Jashpur	230.98	242.03	305.89	430.11	434.81
24	Sarguja	12966.4	16301.3	5681.11	5299.99	8559.59
25	Balrampur	0	0	5308.73	6230.87	4898.07
26	Surajpur	0	0	15237.6	16449.8	11444.7
27	Koriya	13196.8	16452	21872	24419.3	25404.4
	N.H.Udaypur	0	0	209.52	142.84	0
	<b>Total</b>	<b>246146</b>	<b>273725</b>	<b>312602</b>	<b>323542</b>	<b>357268</b>

Source- Directorate of Geology and Mining, Raipur, Chhattisgarh.

### Chhattisgarh : Districtwise Revenue (2014-15)

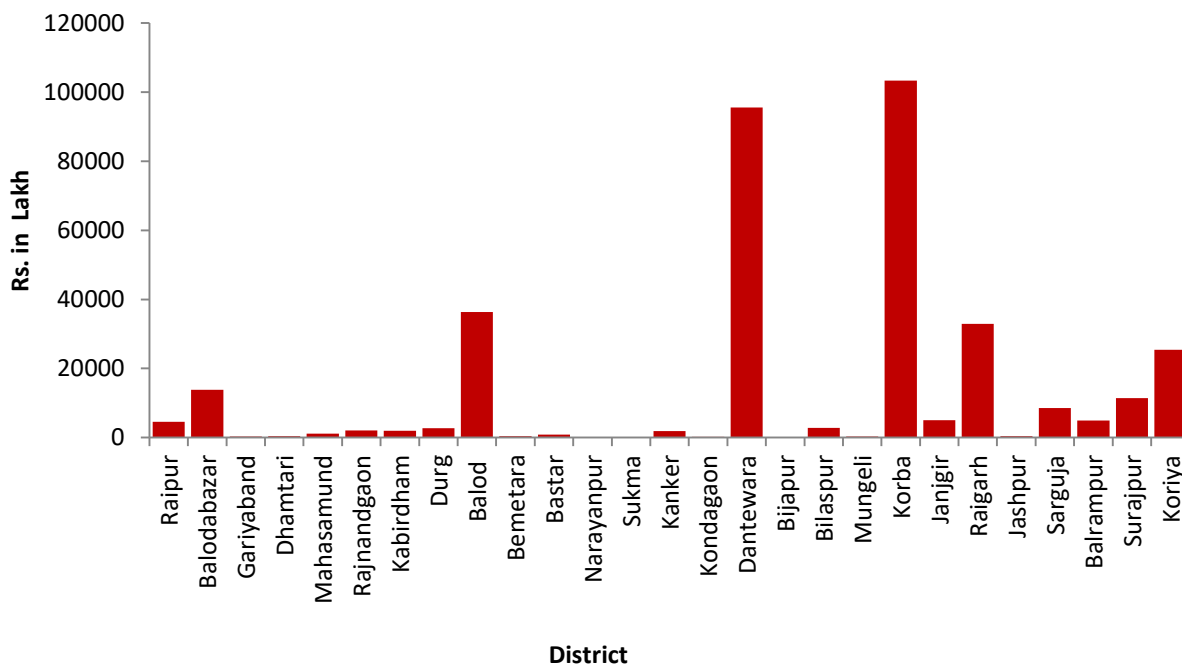


Fig No. 7

## Existing Mineral Based Industries

The industrial development based on the regional resources started only recently during the plan period. A number of major industries, namely the steel plant of Bhilai (capacity- 5.4million tons), a number of cement factories, the aluminium factory (about 1million tons) and the explosives factory of Korba and a large number of small scale and household industries dot the region. However, Surguja and Bastar districts remain still backward in this respect mainly on account of the lack of Infra-structural facilities and initiative. The foundation stone of an integrated steel plant with a capacity of 1 million tons has been laid on the 6th October, 1992 at Mawalibhatha, 27 km from Jagdalpur the headquarters of Bastar district.

BSP is a major Iron and Steel producing plant in the State. The Bhilai Steel Plant, Bhilai (Estd. 1959) has an annual production capacity - Pig Iron 6.30 and Saleable Steel 31.53 lakh Tons. Two major iron ore and steel plants of M/s Tata & M/s Essar are under pipeline in Bastar and Dantewara districts respectively. NMDC also plans to install a major plant in Nagarnar area of Bastar district. Apart from these a large number of sponge iron units are under production or pipeline. Steel casting, re rolling, pig iron, steel ingot, etc. units are operational/proposed in parts of the State based on the raw material availability in the State.

## Sponge/Pig Iron Plants

Over 85 units have been established in the state for producing sponge iron and other allied material. These units are located at Raipur, Bilaspur, Raigarh, Durg, Korba and Janjgir.

## Cement Plants:

Directorate of Geology and Mining, Chhattisgarh in engaged for prospecting of limestone for last many years. Subsequently a large number of suitable sites for establishment of cement plant of various magnitudes have been identified in the state. A list of such sites with their present status is as given under. A large number of PL (Prospect license) and ML (Mining lease) of Limestone have been granted in favor of tens of companies mainly for the production of Portland cement. These are also being mined for other industrial purposes.

There are 7 cement companies in Chhattisgarh- ACC Ltd., Jamul, Durg, Century Cement Ltd, Baikunth Raipur, Grasim Cement Ltd, Rawan, Raipur, Lafarge India Ltd., Gopalnagar, Janjgir, Ultra Tech Cement Ltd. Hirmi, Raipur, Ambuja Cement Eastern Ltd. Rawan, Raipur and Lafarge India Ltd., Sonadih, Raipur The Total annual production capacity is 137.57 lakh tons. All these cement companies are in the process of enhancing their production capacities. Apart from these, numbers, of new companies like Shree Cements, Emami Group, Rungta, Monnet, Jidal, Jaypee, And Adhunik etc. are in the process of establishing major cement units in the State.

## Thermal Power Plants

Chhattisgarh is quite rich in mineral and power resources which form the basis of location of a number of industries in the state. There are found huge reserves of coal in the northern upland, limestone (cement grade) in the central plain and around Jagdalpur and iron ore in the southern upland. The coalfields or Surguja, Koriya, Korba and Raigarh districts contain coal reserves to the extent of 44,483 million tons. The location of six thermal power plants at Korba with installed capacity of 200, 240, 500, 840, 1000 and 21000 MW is the result of these reserves. Availability of cheap electricity has caused establishment of a big aluminium factory (BALCO) at Korba. The National thermal power corporation Korba with capacity of 2100 MW and Siphth 2, Bilaspur with capacity of 1000 MW are working as The National thermal power plants. Besides 4 units at Korba with a capacity of 1780 MW and Bhoramdeo Co. at Kawardha with a capacity of 6 MW are functioning under Chhattisgarh electricity board.

## Aluminium Industries

Bauxite of Chhattisgarh is being consumed mainly in Aluminium Extraction and Calcination Plants. Aluminium extraction plant of BALCO is operational at Korba, based on the leased bauxite blocks of Mainpat in Surguja district from their own ML area, lease hold areas of CMDC and other operators. Aluminium extraction plant of HINDALCO located at Renukot, in Uttar Pradesh is another consumer of Samripat area, Kusmi Tehsil, Surguja district from Chhattisgarh from their ML hold area and lease hold areas of other operators. The existing Bauxite deposits may suffice the need of an Aluminium plant of 1-million-ton production capacity in the State.

## Other Industries

There are five granite cutting and polishing industries at Raipur and Rajnandgaon one corundum cutting and polishing industries at Jagdalpur, three Bauxite calcinations plants at Kanker, Gorgaon (Bastar) and Bilaspur, three hydrated lime plants at Raipur and a clay industry at Rajnandgaon.

## Prospects

Chhattisgarh State has immense potential for prospecting exploration and exploitation of minerals for industrial use and export. Deposits of iron ore, coal, limestone, dolomite, gold, tin ore (Cassiterite), bauxite, poly-metallic ores, diamond and gemstones, dimension stones, etc, of Chhattisgarh are well known the world over. There are good potentials both in mineral exploration as well mineral based industries.

To explore such mineral potential, investments with technical know how and state-of-the-art technology has become inevitable. Potential areas for exploration of diamond, gold and poly-metallic minerals have been identified and being worked by major multinationals, which may facilitate unveiling of other important mineral locations in the State.

Directorate of Geology & Mining has identified number of deposits of bulk minerals like iron ore, limestone, dolomite, coal etc with high industrial specification. Many of them are under exploitation and rest are under process of leasing. Now the avenues are open to look for even lower grade minerals, which were earlier considered as waste. Chhattisgarh has vast resources of low grade deposits of iron ore, limestone, bauxite etc. which may prove to be good deposits for future use.

Good potentials exist in the field of mineral exploitation especially for Bauxite, Coal, Tin ore etc. Bauxite and Cassiterite (Tin) mining is done by CMDC and JVC (HCL). More such companies can be formed for the purpose.

Chhattisgarh is promising State to set-up heavy, medium and small-scale mineral based industries without importing any major raw material from other states. Besides economic deposits of almost all major and minor minerals, the State is rich in power, water and human resources.

Adequate quantity of the raw material is available for sustaining the conventional industries like iron and steel, sponge iron, cement, thermal power generation, calcination, aluminium extraction, cutting and polishing units (gem and dimension stones), ancillary units for and derived from the Cement and Iron industries.

The rare alkali metals lithium, rubidium and cesium and other rare metals like beryllium, gallium, tantalum, niobium etc., are the raw material for the sensitive high-tech equipments, instruments and spares. These high-tech equipments essentially include the miniature energy storage devices, high quality glass and ceramics with high resistance to metal fatigue, electric and space vehicles, etc.

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