Indian Minerals Yearbook 2022

(Part- I)

61st Edition

STATE REVIEWS (Chhattisgarh)

(ADVANCE RELEASE)

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CHHATTISGARH

Mineral Resources

Chhattisgarh is the sole producer of tin concentrates and moulding sand. It is one of the leading producers of coal, dolomite, bauxite and iron ore. The State accounts for about 36% tin ore, 20% iron ore (haematite), 18% coal, 11% dolomite and 4% each diamond & marble resources of the country. Important mineral occurrences in the State are **bauxite** in Bastar, Bilaspur, Dantewada, Jashpur, Kanker, Kawardha (Kabirdham), Korba, Raigarh & Sarguja districts; **china clay** in Durg & Rajnandgaon districts; **coal** in Korba, Raigarh & Sarguja districts; **dolomite** in Bastar, Bilaspur, Durg, Janjgir-Champa, Raigarh & Raipur districts; and **iron ore (haematite)** in Bastar district, Bailadila deposit in Dantewada district, Chhote Dongar deposit in Kanker district, Rowghat, Chargaon, Metabodeli & Hahaladdi deposits in Rajnandgaon district and Boria Tibbu deposits in Dalli-Rajhara area, Durg district. Bailadila-Rowghat hill ranges in the State are considered to be one of the biggest iron ore fields in India. **Limestone** occurs in Bastar, Bilaspur, Durg, Janjgir-Champa, Kawardha (Kabirdham), Raigarh, Raipur & Rajnandgaon districts; **quartzite** in Durg, Raipur, Rajnandgaon & Raigarh districts; and **talc/soapstone/steatite** in Durg & Kanker districts.

Other minerals found in the State are **corundum** in Dantewada district; **diamond** and other gemstones in Raipur, Mahasamund & Dhamtari districts; **fire clay** in Bilaspur, Raigarh & Rajnandgaon districts; **fluorite** in Rajnandgaon district; **garnet** & **marble** in Bastar district; **emerald** & **gold** in Raipur district; **granite** in Bastar, Kanker & Raipur districts; **quartz/silica sand** in Durg, Jashpur, Raigarh, Raipur & Rajnandgaon districts; and **tin** in Bastar & Dantewada districts (Table-1). The reserves/ resources of coal are furnished in Table-2.

Exploration & Development

The details of exploration activities conducted by GSI during 2021-22 are furnished in Table - 3.

Production

Coal, Bauxite, Iron Ore, Tin Conc., Limestone and Moulding Sand are the major minerals produced in Chhattisgarh. The value of minor minerals' production is estimated as ₹ 1024 crores for the year 2021-22. There was 113 reporting mines in 2021-22 for MCDR minerals (Table - 4).

Mineral-based Industry

The present status of each mineral-based industry is not readily available. However, the principal mineral-based industries in the organised sector in the State are furnished in Table - 5.

Table – 1 : Reserves/Resources of Minerals as on 1.4.2020: Chhattisgarh

Mineral	Unit	Reserves				Remaining resources								Total resources (A+B)
		Proved STD 111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	
			STD121	STD122			STD221	STD222						
Bauxite	000' tonnes	19202	1073	3420	23695	14306	4727	46620	37763	75682	771015	18747	968860	992555
Diamond	carat	-	-	-	-	-	-	-	-	-	1304000	-	1304000	1304000
Fluorite	tonne	-	-	-	-	65889	153132	9288	185485	5573	126088	-	545455	545455
Garnet	tonne	-	-	-	-	-	-	-	-	-	28800	-	28800	28800
Gold Ore (Primary)	tonne	-	-	-	-	-	-	-	-	600000	4241033	-	4841033	4841033
Metal (Primary)	tonne	-	-	-	-	-	-	-	-	1.8	3.71	-	5.51	5.51
Graphite	tonne	5282	-	-	5282	-	1330	-	-	-	-	-	1330	6612
Iron Ore (Haematite)	000' tonnes	1289443	99927	204363	1593732	348648	17215	46166	171548	552653	993652	868497	2998379	4592111
Iron Ore (Magnetite)	000' tonnes	29319	-	46557	75876	12263	-	17782	-	-	-	-	30045	105921
Limestone	000' tonnes	1364595	65530	56227	1486351	1658144	903350	298720	1456579	1778018	5630057	-	11724867	13211218
Tin Ore	tonne	2075	-	25	2101	1791	2560	94	168457	559914	29062361	-	29795176	29797277
Metal	tonne	963.19	-	10.8	973.99	1122.95	603.94	29.07	813.29	209.43	13130.9	-	15909.58	16883.57

Figures rounded off.

 # Declared as minor mineral vide Gazette notification dated 10.02.2015.

Table – 2 : Reserves/Resources of Coal as on 1.4.2023 : Chhattisgarh

(In million tonnes)

Coalfield	Proved	Indicated	Inferred	Total
Total	**37236**	**42294**	**1244**	**80774**
Sohagpur	94	434	-	529
Sonhat	950	1983	2	2940
Jhilimili	228	39	-	267
Chirimiri	320	11	31	362
Bisrampur	2014	678	5	2698
East Bisrampur	-	165	-	165
Lakhanpur	456	3	-	459
Panchbahini	-	11	-	11
Hasdeo-Arand	2032	3273	223	5529
Sendurgarh	153	126.	-	279
Korba	8769	4212	49	13030
Mand-Raigarh	20091	28289	847	49228
Tatapani-Ramkola	2128	3064	85	5278

Source: *Coal Directory of India, 2022-23.*

Table – 3: Details of Exploration Activities in Chhattisgarh, 2021-22

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq. km)	No. of boreholes	Meterage		
GSI							
Manganese and Barium							
Korea	Devra-Jatashankar	1: 12,500	100	-	-	90	The Devra-Jatashankar area lies in the north-eastern part of toposheet no. 64I/03 (~95%) and the north-western part of toposheet no. 64I/07 (~5%). The area is predominantly covered with sandstone of Raniganj, Parsora and Pali formations of Gondwana Supergroup. An area of 100 sq. km mapped on a scale of 1: 12,500 and collected BRS (50), PCS (10), PTS (30) samples. Botryoidal form encrustations are present at a few places over sandstone of Parsora and Pali formations. Encrustation over sandstones of Pali and Parsora formations are present at places ranging in thickness from 0.1 cm to 15cm. These encrustations are mostly formed over the sandstone surface and in fracture, crack and joint zones. It indicates that encrustations are formed wherever it is exposed to the atmosphere. There are some

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Table - 3 (contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							penetrative encrustations in sandstones of Parsora Formation. The surface encrustation is thicker while those that are penetrative are thinner (<0.5cm). In BRS samples the MnO values range from 0.01% to 21.57% with an average of 1.05% and Ba values range from 45 ppm to 41255 ppm. In PCS samples the MnO values range from 0.03% to 7.21% with an average of 1.34% and Ba values range from 91 ppm to 43149 ppm. In PTS samples the MnO values vary from 0.01% to 0.19% with an average of 0.04% and Ba values range from 552 ppm to 4710 ppm. Analytical results of BRS, PCS and PTS samples suggest that the encrustation is rich in iron (Fe_2O_3 ranging from 14.4% to 52.56%) while showing very low manganese value in most of the analysed samples.
Gold and associated mineralisation							
Jashpur	Pharsabahar-Tuba area	1:12,500	100	-	-	150	G-4 Stage was initiated during Field Season 2021-22 in parts of Toposheet no. 64N/ 14 in Jashpur district. During the period of investigation, an area of 100 sq. km. was mapped on 1: 12,500 scale with objective to identify the host control for gold mineralistaion as well as the existing litho- structure in the area. Total 50 cu m pitting, trenching and sampling has been carried out in the potential areas along with the collection of 50 nos of stream sediment samples and 100 bed rock samples respectively. Geologically the area of investigation is composed of rocks of Chotanagpur Gneissic Complex and falls within Bilaspur-Raigarh-Sarguja belt consist of granodiorite-gneiss, meta gabbro and amphibolite with its variants. These rocks are traversed by 3 generation of quartz veins of varying dimension. The second-generation quartz veins are generally mineralised with gold values. Pyrite, arsenopyrite, galena, azurite, chalcopyrite is

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Table - 3 (contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							often seen associated with this quartz vein. Five blocks identified are Tuba block, Mankarkunda block, Bangaon block, Northern most Pandripani block and Barkaspali block. Gold value in Zone-I of Tuba block is 0.052 ppm, 0.51 ppm, 0.24 ppm, 0.068 ppm (trench-2 value) and 3.73 ppm and 0.41 ppm (BRS value) and in Zone-II of Tuba block is 0.056 ppm (trench-1 value) and 0.34 ppm and 0.28 ppm in BRS value. Besides BRS value adjacent to zones are 0.395 ppm, 7 ppm and 0. 14 ppm. In Mankarkunda block gold values are 0.20 ppm and 0.16 ppm (trench-13) and 0.06 ppm and 0.375 ppm (BRS value) and 0.86 ppm in trench-3 and 1.4 ppm in BRS at west. Highest value for gold in PT/BRS/46 is 36.68 ppm collected from Tuba village from intense ferruginised quartz venations within granodiorite; in association with Pb 0.23%, As 68.12 ppm and Hg 13 ppb. Sample PT/BRS/45 is with maximum value of Au 3.72 ppm and As having 30.95 mg/kg collected from mineralised quartz vein Tuba village. Sample PT/BRS/ 24 with maximum value of Au 15.8 ppm, As 22447.32 ppm, Pb 400 ppm, Bi 7.09 ppm and Hg 50 ppb collected from sheared ferruginised granodiorite with quartz chert band at north of Pandripani village.
Baloda Bazar & Bilaigarh	Saliha-Parsapali area	1:12,500	100	-	-	-	A total of 100 sq. km large scale mapping on 1: 12,500 scale has been carried out, in and around Saliha-Parsapali area, Baloda Bazar district and Bilaigarh Chhattisgarh in toposheet no. 64K/10& 64K/14. Apart from mapping, 15 nos. of petrochemical samples (PCS), 20 nos. of petrographic samples (PS), 100 nos. of bed rock samples (BRS) were collected. About 100 cu. m pitting/trenching was carried out along with collection of 100 nos. of pitting/trenching samples (PTS). In addition to these, 50 nos. of stream sediment samples were collected from mostly first order

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Table - 3 (contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							streams (rarely from second order) and submitted for analysis. The study area represented by volcano-sedimentary sequence belongs to Sonakhan Group, basic and acid igneous suite belonging to Bilari Group and younger intrusive granitoids and basic dykes. These rocks are intruded by mafic-ultramafic intrusives, undeformed granitoids, younger dykes and quartz veins. Quartz veins in this area are milky white in nature and at places oxidised. Silt size gold grains are recovered during the panning of the stream sediments. Visible specks of sulphide (mostly pyrite) have been recorded at the contact zones within metabasalt, metagabbro and metarhyolite. The analytical data reveals highest value of Cu (0.12%) recorded from bed rock sample (BRS-7) of altered gabbro near Harilchhaper village. The highest value for gold (Au-3.64 ppm) is obtained for BRS-85 collected from intense ferruginised quartz venations within metarhyolite of Barkachhar area. The BRS-90 having Au of 0.26 ppm & BRS-92 with Au value of 0.25 ppm is recorded from soil samples of silicified metarhyolite collected to the south of Dhourabhata area and BRS-96 with Au value of 0.41 ppm is obtained from ferruginous chert to the SW of Pachperiya village.
Base Metal							
Balrampur	Burhabagicha area	1:12,500	100	-	-	237	A G-4 stage exploration for basemetal was carried out in Burhabagicha area, Balrampur District, Chhattisgarh with an objective to search for potential zones of basemetal mineralisation. 100 sq.km. was mapped under Large Scale Mapping on 1: 12500 scale with collection of 169 nos. samples (101 nos. bedrock, 50 nos. pit/ trench and 18 nos. of stream sediment) for trace element analysis, 23 Nos. for petrochemical studies and 45 Nos. for PS/SEM/OM studies. The area around

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Table - 3 (contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							Burhabagicha encompasses supracrustals of meta-volcano sedimentaries, meta-sedimentaries, meta-basics and granitoids. Acid- to intermediate- metavolcanic is the host rock for sulphide mineralisation. Oxidised zone is developed between west of Chilma and Kotaghna through Burhabagicha. It is characterised by sulphide-sulfosalt, iron oxide stain and very rare malachite stain. Sulphide in the host present in the form of dissemination, streak and vein. Mineral assemblage recorded is pyrite, sphalerite, galena and REE. Pyrite is the abundant sulphide mineral recorded. Sphalerite is occasionally present mainly as fracture filling in pyrite. Galena is rare to occasional present as dissemination in the pyrite. Monazite and xenotime are present occasionally. Sphalerite and galena associated with pyrite is 40 µm to 400 µm and 2 µm to 30 µm in size. The values of Cu in acid to intermediate metavolcanic bedrocks range from 10 ppm to 90 ppm. Pb ranges from <10-140 ppm and Zn ranges from 10 ppm to 200 ppm. Ni <10 ppm to 170 ppm, Co <10 ppm to 30 ppm and Cr <10 ppm to 59 ppm recorded in the host rock. It yields Ag values between <1 ppm and 3 ppm and Cd values <10 ppm. Au value in this unit is recorded <50 ppb. As in it ranges from 2 ppm to 749 ppm.
REE							
Mahasamund	Sorid-Nawagaon area	1:12,500	110	-	-	265	An area of about 110 sq. km. was covered by reconnaissance mapping on 1:12,500 scale. A total of 60 nos. of stream sediment samples, a total of 35 nos. of PCS samples, 35 nos. of BRS, 25 nos of PS samples, 25 nos. of soil samples and 25 nos. of PTS samples have been collected and submitted for analysis. Total 60 nos. of heavy mineral samples have been processed via panning, jigging, magnetic separation and thereafter bromoform separation and studied under microscope. Mainly the area is covered with porphyritic granite and equigranular granite belonging to the Dongargarh Granitoids and some part

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Table - 3 (contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							is covered with Lohardih sandstone. The porphyritic granite is leucocratic, very coarse to coarse grained, massive and is composed of quartz, alkali feldspar, and plagioclase as essential minerals whereas biotite and muscovite are as accessories. Equigranular granite is leucocratic, medium grained, massive to feebly foliated and consists of quartz, alkali feldspar, and plagioclase as essential minerals whereas, biotite, muscovite, and epidote as accessories. Analytical results of samples were received showing the concentration of tREE in BRS samples ranged from 529.57 to 944.87 ppm, PTS samples ranged from 501.8 to 1456.3 ppm and PCS samples ranged from 520.48 to 1403.42 ppm. From the analytical results of REE, it is observed that bed rock samples from equigranular granite (monzogranite) around Hadabandh area are better locales for REE concentrations. Pit samples from porphyritic granite, to the North of Arand village also provided higher tREE concentration of 1403.42 ppm.
Lithium and associated rare metals							
Korba	Tarmapahar and Konkona area	1:12,500	100	-	-	-	A total of 100 sq. km. large scale mapping on 1:12,500 scale was carried out in and around Tarma pahar and Konkona area, Korba district, Chhattisgarh in parts of toposheets no 64J/06 and J/10. Five varieties of granitic rocks including (i) foliated granite, (ii) leucocratic equigranular granite, (iii) medium to coarse-grained syeno- to monzogranite, (iv) granitic pegmatite and (v) granodiorite were delineated and pegmatites were also mapped. The leucogranite also grades into very coarse-grained granitic pegmatite and occurs in close association with Li-mica bearing pegmatites and also occurs as irregular patches within the equigranular leucogranite. It contains mica books (white and golden brown) and profuse

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Table - 3 (contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							tourmaline. Field studies suggest cogenetic relation between leucogranite coarse-grained syeno- to monzogranite and granitic pegmatite. The pegmatites are mostly exposed as amoeboidal patches in the granites. South of Tarma Pahar, the pegmatites mostly have an E-W trend with a high dip of 80° towards N. Some pegmatites south of Tarma Pahar have a NW-SE trend. These comprise of quartz, alkali feldspar, minor garnet, muscovite, tourmaline and golden-brown mica. Near Jongridongri, the pegmatites show compositional zoning and have been divided in to 3 distinct zone with different mineralogical variation. As per the chemical data received the values of Li in the bedrock samples are not encouraging. Values of Li range from 6.56-193.58 ppm. The analytical values only show significant concentration of Rb in many granites (as high as 1107 ppm). The values of Nb and Ta in the equigranular granite range from 1.39-105.94 ppm and 0.77-16.86 ppm respectively. In the pegmatitic Ta value ranges from 0.19-146.24 ppm and Nb value ranges from 1.44-197.34 ppm respectively.
Graphite							
Balrampur	Oranga-Revatipur areas	1:4000	3.6	16	1392	572	A G-3 stage preliminary exploration for graphite was carried out in Oranga-Revatipur areas in Balrampur district, Chhattisgarh during FS 2021-22. The study area falls in the northern part of Chhattisgarh, in toposheet no. 64M/5 and belongs to Bilaspur-Raigarh-Surguja (BRS) metamorphic belt. Area mainly comprises of meta-sedimentary sequences of the Older Metamorphic Group and consist quartzite, quartz mica schist, graphite mica schist, calc silicate and amphibolite. An area of 3.6 sq. km. was covered by Detailed Mapping on 1:4000 scale followed by geophysical survey of 12 L.km. A

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Table - 3 (contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							total of 59.2 cu. m of trenching was carried out and 55 nos. of trench/pit samples were analysed for fixed carbon analysis. A total of 10 petrochemical samples (PCS) and 20 petrological samples (PS) were analysed. A total of 16 nos. of first level boreholes have been drilled with 200 m spacing in block area. A total of 1392 m was drilled in first level boreholes and 487 nos. core sample generated during Field Season 2020-21 & 2021-22 for G-3 stage of mineral investigation. In borehole graphite mica schist has varying thickness from 1 m to 60 m and is intercalated with quartz mica schist and calc silicates. Analytical result of drilled core samples reveals the fixed carbon content ranging from 4.47% to 10.33%.
Coal							
Surguja	Aklasarai Area, Sonhat Coalfield	1:10000	45	-	3100.05	-	A total of 45 sq.km area has been geologically mapped on 1:10,000 scale. Major part of the mapped area is covered by the rocks of Raniganj Formation, the Barren Measures occur as outliers in the north and north-western part and the Parsora Formation are exposed in the ridges to the north of the exploration area. The Parsora Formation rocks are represented predominantly by quartz arenite with thin beds of variegated shale, siltstone with clay clasts of varying dimension. The Raniganj Formation is characterised by grey shale, interlaminated, ripple laminated fine grained sandstone/ siltstone and shale (heterolith) and fine to medium grained cross bedded sandstone and coal seams. The shales, siltstone and the carbonaceous shales belonging to this formation carry a variety of plant fossils viz. Glossopteris, Gangamopteris, Vertebraria indica etc. The Barren Measures outcrop, occupying the northern part of area, is surrounded by the rocks of Raniganj Formation. Barren Measures is mainly represented by

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Table - 3 (contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							medium to coarse grained, occasionally gritty, light grey sandstone and occasional coal seams, the coal seams are shaly in nature. Barakar Formation the area is represented by greyish white, clayey matrix, medium to coarse grained, cross-bedded sandstone. The lithological assemblage of Talchir Formation is represented by diamictite, sandstone, conglomerate, rhythmite, greenish and chocolate needle shale, shale-siltstone alternation and moderately to poorly sorted greyish white sandstone of varying grain sizes. General Strike of beds is ENE-WSW and dipping towards NW with dip amount varying from 3° to 5° in the major part of the area. Two faults are interpreted in the area on the basis of subsurface data of boreholes. A total of four boreholes drilled in the area. The total drilling is 3100.05 m till date and total of 68.31 m coal is encountered in all the four boreholes. Five regional coal seams (I to V & one local seam) intersected within a depth range of 108.18 m and 759.10 m. Thickness varying from Min-0.52 m (Seam-I, SHA-1) to Max- 16.44 m (Seam-IV, SHA-3) and local seam Seam-VL of 0.56 m at the depth of 317.28 m also at 108.18 m (0.68 m) and 126.87 m (0.50 m) in SHA-4. Borehole wise thickness is 11.20 m (SHA-1), 19.99 m (SHA-2), 24.73 m (SHA-3) and 5.97 m (SHA-4). Band by band analysis of borehole no. SHA-1 and SHA-4 shows the significant result i.e., moisture content <2% in most of the samples. Further analysis (SHA-1) of caking grade varies from C to D after conducting LTGK (low temperature gray king) coke essay. Barakar coal seams are moderate in thickness and fairly persistent over the Aklasarai area. Five coal seams (Seam-I to V) of regional extent have been encountered in the area (SHA-1), four coal seams (Seam-I to IV) of regional extent have been

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Table - 3 (contd)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							encountered in the SHA-2, four coal seams (Seam-II to V) of regional extent have been encountered in the SHA-3 and three Barakar coal seam have been encountered (Seam-III to V). All coal seams are intersected between 108.18 m and 759.10 m depths in Barakar Formation. The cumulative thickness of the individual coal seams is varying from less than a meter to 16.44 m. The thickest coal seam in all the drilled boreholes is seam no. IV which is having thickness ranging from 2.14 m (SHA-4) to 16.44 m (SHA-3). ?REEs in coal samples of the study area varies from 104.50 ppm to 352.20 ppm. While in carbonaceous shale samples it varies from 141.30 to 443.20 ppm and in shale samples the ?REEs varies from 134.40 ppm to 382.90 ppm. LREE and MREE is attributed due to presences of apatite, plagioclase and mica in the source rock. Whereas, positive Tm anomaly represent the presence of zircon and garnet in the source rock. Petrographic study of five sandstone samples from Barakar Formation was carried out and it reveals that the sandstones are arkose to sub-arkose (after Folk, R.L., 1980) in composition. In Aklasarai area, a total of 950.76 million tonnes coal resource of 'Reconnaissance Resource' category has been estimated over an area of 45 sq. km.
Raigarh	Dhibodih Area, Mand-Raigarh Coalfield	1:10000	49	-	-	-	Large scale mapping (RF 1:10,000) of 49.00 sq. km. area has been carried out during this period. The present area is covered by rocks of Kamthi Formation. The Kamthi Formation is composed of reddish-brown medium to coarse grained cross bedded sandstone with occasional clay clasts, at places ferruginous in nature. Further subsurface investigation by drilling revealed the litho-assemblages of Lower Gondwana sequence belonging to Barakar Formation, Barren Measures and Raniganj

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Table - 3 (concld)

Agency/ Mineral/ District	Location	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							Formation. The contact between Barren Measures and Barakar Formation as well as Barren Measures and Raniganj Formation are gradational. Subsurface data in the Dhibodih Area depicts lithological association of medium to very coarse-grained subarkosic sandstone, heterolithic sequence of siltstone, grey shale, mudstone, carbonaceous shale, and regionally persistent thick coal seams of economic importance. Barren Measures rocks comprises mostly of dark grey to ash grey mudstone/shale and siltstone with a minor amount of light grey, very fine to fine grained sandstone, and interbanded sequence of sideritic claystone with few local Barren Measures seams. The Raniganj Formation is characterised by a cyclic sequence of fining upward medium to fine grained sandstone and heteroliths of siltstone, mudstone, and shale with the occurrence of two local coal seams (R-III & R-I) having cumulative thickness ranges from 0.50 m to 3.05 m. The subsurface studies in Dhibodih Area revealed a general strike of N75°W-S75°E with a southwesterly dip of 3°.

Table –4: Mineral Production in Chhattisgarh, 2019-20 to 2021-22 (Excluding Atomic Minerals)

(Value in ₹'000)

Mineral	Unit	2019-20			2020-21			2021-22 (P)		
		No. of mines	Quantity	Value$	No. of mines	Quantity	Value$	No. of mines	Quantity	Value$
All Minerals		**102**		**118108145**	**102**		**153480094**	**113**		**240475866**
Coal	'000t	-	157745	-	-	158410	-	-	154120	-
Bauxite	t	15	1565307	1609377	14	716296	751459	13	968247	1085795
Iron Ore	'000t	20	34728	99153323	21	36839	132201316	21	41313	218099187
Tin Conc.	kg	6	15530	10337	5	16865	10413	6	26292	31979
Graphite (r.o.m.)	t	1	908	409	1	1701	2041	1	-	-
Limestone	'000t	57	42699	10200663	57	40378	10139974	68	41888	11009962
Moulding Sand	t	3	12905	3766	4	14363	4150	4	16843	5080
Minor Minerals		-	-	7130270	-	-	10370741	-	-	10243863

Note : *The number of mines excludes Fuel and minor minerals.*

$ Excludes the value of Fuel minerals.

Table – 5 : Principal Mineral-based Industries

Industry/plant	Capacity ('000 tpy)
Aluminium	
Bharat Aluminium Co. Ltd (Unit I & II), Korba. (#Plants remained non-operational during the year).	200# (Alumina) 570 (Aluminium)
Cement	
ACC Ltd, Jamul, Distt Durg.	2400
Ambuja Cements Ltd, Bhatapara, Distt. Raipur.	3500
Bhilai Jaypee Cement Ltd, Bhilai, Distt Durg (G).	2200
Century Cement, Baikunth, Distt Raipur.	2100
Century Textile & Industires Ltd, Tandwa, Tilda	2400
Emami Ltd, Baloda Bazar, Distt Raipur	2500 3200 (clinkar)
Emami Ltd, Risda Baloda Bazar, Distt Raipur	2500
Emami Cement Ltd, Risda Baloda Bazar	3000
J. K. Laxmi, Durg	2.7
J. K. Laxmi Cement Ltd, Malpurikhurd, khasadhe, Dhamdha	2400
Lafarge India Pvt. Ltd, Arasmeta, Distt Janjgir-Champa.	1.8
Lafarge India Pvt. Ltd, Sonadih, Distt Raipur	550
NUVOCO Vistas Co. Ltd Sonadih Cement Plant, Rasedi, Baloda Bazar	1000
Shree Cement, Baloda Bazar, Distt Raipur	3000
Shree Cement Ltd, Khapradih Simga, Balrampur.	3000
UltraTech Cement Ltd, Hirmi, Distt Raipur.	1900
UltraTech Cement Ltd, Rawan, Distt Raipur.	2500
Chemical	
Indu Ragukul Food &	1.5 (Sodium Dicromate)
Chemical Pvt. Ltd,	2.7 (Sodium chromate)
Rajghatta, Kharsia	1.35 (Sodium sulphate)
Electrode	
Calcutta Electrode Pvt. Ltd, Bhanpuri, Raipur	7.40
Fertilizer	
BEC Fertilizers, Sirgitti, Distt Bilaspur	850000

(contd)

Table - 5 (contd)

Industry/plant	Capacity ('000 tpy)
Dharamsi Morarji Chemical Co. Ltd, Kumhari, Distt. Durg.	183 (SSP & H_2SO_4)
Khaitan Chemicals & Fertilizers Ltd, Distt Rajnandgaon.	66 (SSP) 49.5 (H_2SO_4)
Iron & Steel	
Bhilai Steel Plant, Bhilai	6334 (Sinters) 4700 (Pig iron) 3925 (crude/liquid steel) 30 (Refractory bricks)
Jindal Steel & Power Ltd, Raigarh	2500 (Sinters) 1320 (Sponge iron) 8600 (Crude/liquid steel)
Jayaswal NECO Industries Ltd, Siltara, Distt Raipur.	650 (Pig iron) 255 (Sponge iron) 1200 (pellets) 1200 (Steel)
Monnet Ispat & Energy Ltd, Naharpalli, Raigarh	962.3 (Sinters) 612.5 (Pig iron) 750 (MS billet) 450 (TMT Bar)
Sarda Energy & Minerals Ltd, (formerly Raipur Alloys & Steel Ltd), IGC, Siltara, Distt Raipur.	600 (Pellets) 360 (Sponge iron) 240 (Finished steel)
Shri Bajrang Power & Ispat Ltd, Borjhara, Distt Raipur.	210 (Sponge iron) 130 (Steel) 1200 (pellets)
Sponge Iron	
A.P.I. Ispat & Power Tech. Pvt. Ltd, Siltara Billets, Raipur	210
Alliance Integrated Metallics Ltd, Bemta, Distt Raipur.	500
Anjani Steel Ltd, Ujalpur, Distt Raigarh	108
Arti Sponge & Power Ltd, Siltara, Distt Raipur	60
Ambika Ispat (I) Pvt Ltd, Tarainal, Distt Raigarh	30
Baldev Alloys Pvt. Ltd, Siltara, Raipur	30
Bhagavati Power & Steel Pvt Ltd, Siltara, Distt Raipur	60
B.S. Sponge Pvt Ltd, Taraimal, Raigarh	90
Crest Steel & Power Pvt. Ltd, IGC Borai, Distt Durg	231
Devi Iron & Power Pvt Ltd, Tandira, Distt Raipur	90
Drolia Electro Steel Pvt Ltd, Siltara, Raipur	66
Euro Pratik Ispat Pvt Ltd, Charoda, Distt Raipur	30
Gravity Treksim Pvt Ltd, Siltara, Distt Raipur	30
Godavari Power & Ispat Ltd, Siltara, Distt Raipur	495 2100 (pellets)

(contd)

Table - 5 (contd)

Industry/plant	Capacity ('000 tpy)
Gopal Sponge & Power Pvt Ltd, Siltara, Distt Raipur	30
Gitanjali Ispat & Power Pvt Ltd, Sirgititi, Distt Bilaspur	10
GR Sponge & Power Ltd, Siltara, Distt Raipur	72
Shree Hare Krishna Sponge Iron Ltd, Siltara, Distt Raipur	12000
Jai Shree Balaji Steel Pvt Ltd (HEG Ltd), Borai, Distt Durg	120 (Sponge iron)
Hi-Tech Power & Steel Ltd, Parsada, Distt Raipur	60
Khetan Sponge & Infrastructure Pvt. Ltd, Sarora, Distt Raipur	30
Maa Kali Alloys (Ind.) Pvt Ltd, Pali, Distt Raigarh	60
MSP Steel & Power Ltd, Raigarh	192 900 (pellets)
Monnet Ispat & Energy Ltd, Hasaud, Raipur	300 250 (Semi-finished Steel) 150 (Finished Steel)
Monnet Ispat & Energy Ltd, Naharpalli, Raigarh	500
NR Sponge Pvt. Ltd, Raipur	90
Nalwa Steel & Power Ltd, Taraimal, Raigarh	198
Nakoda Ispat Ltd, Siltara, Raipur	171
Niros Ispat Pvt. Ltd, Hathkhoj, Bhilai	97.5
Nova Iron & Steel Ltd, Dagori, Bilaspur	150
Nutan Ispat & Power Ltd, Jaroda, Raipur	60
PD Industries Pvt. Ltd, Siltara, Raipur	60
Prakash Industries Ltd, Hathenewra, Janjgir-Champa	1000
Raigarh Ispat & Power Ltd, Delari, Distt Raigarh	60
Rameswaram Steel & Power Ltd, Gharghoda, Distt Raigarh	72
Real Ispat and Power Ltd, Borjhara, Raipur.	60 460 (Finished Steel)
Sarda Energy & Minerals Ltd, Mandhar, Raipur	150
Hanumant Alloys (India) Pvt. Ltd, Hardikala, Distt Bilaspur	16.5
Shivalaya Ispat & Power Pvt Ltd, Guma, Distt Raipur	90
Shivshakti Steel Pvt. Ltd, Chakradharpur, Distt Raigarh	97.5

(contd)

Table - 5 (contd)

Industry/plant	Capacity ('000 tpy)
Shree Shyam Ispat (India) Pvt. Ltd, Taraimal, Raigarh	120
Singhal Enterprises Pvt Ltd, Taraimal, Distt Raigarh	253.5
Singhal Energy Pvt. Ltd, Taraimal, Raigarh	60
Sree Nakoda Ispat Ltd, Siltara, Distt Raipur	66
Sunil Sponge Iron Ltd, Chiraipani, Distt Raigarh	60
Sunil Sponge Pvt. Ltd, Munrethi, Dharsiwa	60
Topworth Steel Pvt Ltd, Rasmada, Distt Durg	165
Trimula Sponge Iron Pvt Ltd, Siltara, Raipur	30
Vandana Global Ltd, Siltara, Distt Raipur	216
Vasvani Industries Ltd, Siltara, Distt Raipur	90
Vidhyan Minerals India Pvt. Ltd, Bilaspur	30
Ferro Alloys	
Alok Ferro Alloys Ltd, Urla, Raipur	18
Deepak Ferro Alloys Ltd, Urla, Distt Raipur	5
Indsil Energy & Electro Chemical Ltd, Urla, Distt Raipur	19.2
Hira Ferro alloys Ltd, Urla, Distt Raipur	61.5
Jindal Steel & Power Ltd, Kharsia, Distt Raigarh	36
Sarda Energy & Minerals Ltd, (merged Chhattisgarh Electricity Co. Ltd) Siltara, Distt Raipur	600 (Pellets) 360 (Sponge Iron) 410 (Finished Steel) 150 (Silico & Ferro–manganese
Nav-chrome Ltd, Urla, Distt Raipur	50
Orion Ferroalloy Pvt. Ltd Punjipathra, Gharghora	8
V.A. Power & Steel Pvt. Ltd Punjipathra, Gharghoda Manganese Oxide	8.1(Fe-Si) 14.4(Si-Mn)
Vandana Allied Minerals and alloy Bodegaon, Durg	3.6
Refractory	
SAIL Refractory Unit (formerly Bharat Refractories Ltd), Bhilai, Distt Durg	60
Vishva Vishal Engineering Ltd, Bhilai, Distt Durg	8.2

***(G)**; Grinding Unit*

***Note:** Data, not readily available for fertilizer and cement industries on respective websites, is taken from Indian Fertilizer Scenario, FAI Statistics, and Survey of Cement Industry & Directory, respectively.*

 # plant remained unoperational during the year