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(Part-I)

59th Edition

STATE REVIEWS (Odisha)

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GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

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ODISHA

Mineral Resources

Odisha is the leading producer of chromite, garnet (abrasive), bauxite, manganese ore, iron ore, sillimanite, quartzite and dolomite. The State hosts the country's sole resources of ruby. It accounts for the country's 96% chromite, 93% nickel ore, 90% PGM metal, 69% cobalt ore, 51% bauxite, 44% manganese, 34% iron ore (haematite), 25% sillimanite, 24% fireclay, 23% pyrophyllite, 20% vanadium ore, 17% mica, and 10% dolomite resources. As per AMD of the Department of Atomic Energy, Odisha, accounted for 150.62 million tonnes of rutile resources.

Important minerals that occur in the State are: **bauxite** in Balangir, Kalahandi, Kandhamal, Kendujhar, Koraput, Malkangiri, Rayagada & Sundargarh districts; **china clay** in Bargarh, Boudh, Balangir, Kendujhar, Koraput, Mayurbhanj, Sambalpur & Sundargarh districts; and **chromite** in Balasore, Cuttack, Dhenkanal, Jajpur & Kendujhar districts. Chromite deposits of Sukinda and Nuasahi ultramafic belt constitute 95% of the country's chromite resources. Besides, **coal** occurs in Ib river valley and Talcher coalfield, Dhenkanal district; **dolomite** in Bargarh, Kendujhar, Koraput, Sambalpur & Sundargarh districts; **dunite/pyroxenite** in Kendujhar and Sundargarh districts; **fireclay** in Angul, Cuttack, Dhenkanal, Jharsuguda, Khurda, Puri, Sambalpur & Sundargarh districts; **garnet** in Ganjam, Kalahandi & Sambalpur districts; **graphite** in Bargarh, Boudh, Balangir, Kalahandi, Koraput, Nuapada & Rayagada districts; **iron ore (haematite)** in Dhenkanal, Jajpur, Kendujhar, Koraput, Mayurbhanj, Sambalpur & Sundargarh districts; **iron ore (magnetite**) in Mayurbhanj district; **limestone** in Bargarh, Koraput, Malkangiri, Nuapada, Sambalpur & Sundargarh districts; **manganese ore** in Balangir, Kendujhar, Koraput, Rayagada, Sambalpur & Sundargarh districts; **Pyrophyllite** in Kendujhar district; **quartz/silica sand** in Boudh, Balangir, Kalahandi, Sambalpur & Sundargarh districts; **quartzite** in Balangir, Dhenkanal, Jajpur, Jharsugada, Kendujhar, Mayurbhanj, Sambalpur & Sundargarh districts; **sillimanite** in Ganjam & Sambalpur districts; **talc/ steatite/soapstone** in Mayurbhanj, Sundargarh & Sambalpur districts; **titanium minerals** in Dhenkanal, Ganjam, Jajpur & Mayurbhanj districts; and **zircon** in Ganjam district.

Other minerals that occur in the State are **asbestos** in Kendujhar district; **cobalt** in Cuttack & Jajpur districts; **copper** in Mayurbhanj & Sambalpur districts; **granite** in Angul, Boudh, Balangir, Cuttack, Deogarh, Dhenkanal, Ganjam, Kendujhar, Khurda, Koraput, Mayurbhanj, Nuapada, Rayagada & Sambalpur districts; **lead** in Sargipalli area, Sundargarh district; **mica** in Sonepur district and **nickel** in Cuttack, Kendujhar & Mayurbhanj districts. Occurrences of **ruby** and **emerald** are reported from Balangir and Kalahandi districts, respectively. **Platinum Group of Metals** occur in Kendujhar district; **silver** in Sundargarh district; **tin** in Koraput & Malkangiri districts; and **vanadiferous magnetite** occurs in Balasore & Mayurbhanj districts (Table-1). The various coalfields along with their reserves/resources are given in Table - 2.

Exploration & Development

The details of exploration activities conducted by GSI for iron ore, manganese ore, coal & REE and other agencies during 2019-20 are furnished in Table - 3.

Production

The important minerals produced in the state were Coal, Bauxite, Chromite, Iron Ore, Manganese Ore, Graphite and Limestone etc. during 2019-20. The value of minor minerals' production was estimated at ₹ 86 crore for the year 2019-20. The number of reporting mines in 2019-20 was 129 in case of MCDR minerals (Table-4).

Table – 2: Reserves/Resources of Coal as on 1.4.2020: Odisha

(In million tonnes)

Coalfield	Proved	Indicated	Inferred	Total
Total	**40871.77**	**36067.17**	**7713.12**	**84652.06**
Ib-River	15355.91	13135.30	3610.53	32101.74
Talcher	25515.86	22931.87	4102.59	52550.32

Source: *Coal Directory of India, 2019-20.*

Table – 1: Reserves/Resources of Minerals as on 1.4.2015: Odisha

Mineral	Unit	Reserves				Feasibility	Pre-feasibility		Remaining Resources					Total resources (A+B)
		Proved	Probable		Total (A)				Measured	Indicated	Inferred	Reconnaissance	Total	
		STD 111	STD121	STD122		STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	
Asbestos	tonne	-	-	-	-	-	-	-	10000	37200	9500	-	56700	56700
Bauxite	'000 tonnes	176002	411	148856	325269	166547	66189	280396	365938	155253	590780	44202	1669305	1994574
China clay#	'000 tonnes	-	-	-	-	3600	3503	5018	368	35770	236546	1354	286157	286157
Chromite	'000 tonnes	64150	12427	24835	101412	67311	15529	33354	26850	32372	33434	20452	229301	330714
Cobalt	million tonnes	-	-	-	-	-	-	-	30.63	-	0.28	-	30.91	30.91
Copper														
Ore	'000 tonnes	-	-	-	-	-	-	-	1420	2536	2095	-	6051	6051
Metal	'000 tonnes	-	-	-	-	-	-	-	21.69	21.06	20.69	-	63.44	63.44
Dolomite#	'000 tonnes	109551	6421	34839	150811	42521	33896	110904	48535	46683	330660	85884	699082	849892
Dunite#	'000 tonnes	308	-	-	308	172	1925	6215	686	307	2531	-	11837	12145
Fireclay#	'000 tonnes	133	-	40	173	3074	12376	4495	26219	42925	83662	-	172751	172924
Garnet	tonne	8459821	-	585130	9044951	5	-	-	-	-	348000	-	348005	9392956
Granite##														
(Dim. Stone)	'000 cu. m	-	80000	-	80000	-	-	-	330328	-	1432492	5160	1767980	1847980
Graphite	tonne	209795	-	249176	458971	9314306	3312065	1415295	696021	838559	2628394	304628	18509268	18968239
Iron ore														
(Haematite)	'000 tonnes	1830569	252615	489034	2572217	1180055	704302	530440	271349	426493	1773077	100730	4986447	7558664
Iron ore														
(Magnetite)	'000 tonnes	74	-	-	74	8	-	-	27	-	43	-	79	152
Laterite#	'000 tonnes	-	-	-	-	-	-	-	-	-	-	1227	1227	1227
Lead-Zinc														
Ore	'000 tonnes	-	-	-	-	-	961	119	-	-	670	-	1750	1750
Lead metal	'000 tonnes	-	-	-	-	-	34.32	4.25	-	-	38.39	-	76.96	76.96
Limestone	'000 tonnes	255555	77879	61007	394442	173797	548527	420634	139924	50397	361350	32635	1727264	2121706
Manganese ore	'000 tonnes	16703	10528	3413	30643	32622	23942	37292	16130	15119	48764	11889	185760	216403
Mica#	kg	-	-	-	-	-	-	51856000	-	26712000	26712000	-	105280000	105280000
Nickel ore	Million tonnes	-	-	-	-	-	20.84	20.62	30.85	51.06	51.26	-	174.63	174.63
Pt. Group of														
metals	tonne	-	-	-	-	-	-	-	-	7.7	6.5	-	14.2	14.2
Pyrophyllite#	tonne	2781889	1094902	-	3876791	6978702	216661	766105	80	40	1782070	68401	9812058	13688848
Quartzite#	'000 tonnes	20050	151	18381	38582	16861	6914	5128	364	274	71503	927	101971	140554
Quartz-														
Silica sand#	'000 tonnes	567	109	725	1401	344	2038	2918	93	63308	3944	179	72824	74225
Rare-earth														
elements	tonne	-	-	-	-	-	-	-	-	6353	19140	-	25493	25493
Ruby	kg	-	-	-	-	-	429	3296	-	-	1623	-	5349	5349
Sillimanite	tonne	-	5728868	427705	6156573	-	-	6557013	-	-	4943600	-	11500613	17657186

(contd)

Table – 1 (concld)

Mineral	Unit	Reserves				Feasibility	Pre-feasibility		Remaining Resources					Total resources (A+B)
		Proved	Probable		Total (A)				Measured	Indicated	Inferred	Reconnaissance	Total (B)	
		STD 111	STD121	STD122		STD211	STD221	STD222	STD331	STD332	STD333	STD334		
Silver														
Ore	tonne	-	-	-	-	-	960500	119000	-	-	670000	-	1749500	1749500
Metal	tonne	-	-	-	-	-	27.34	3.4	-	-	34.17	-	64.91	64.91
Talc/Steatite/														
Soapstone#	000 tonnes	-	-	8	10	106	89	193	151	-	278	-	817	827
Tin														
Ore	tonne	-	-	-	-	12692	636	-	-	1166	1000	-	15494	15494
Metal	tonne	-	-	-	-	34.63	500.78	-	-	22.2	10	-	567.61	567.61
Vanadium														
Ore	tonne	-	-	-	-	-	1220000	-	-	232000	3412795	-	4864795	4864795
Metal	tonne	-	-	-	-	-	2135	-	-	487.2	10935.74	-	13557.94	13557.94

Figures rounded off.

 # Declared as Minor Mineral vide Gazette Notification dated 10.02.2015

Minor Mineral before Gazette Notification dated 10.02.2015

Table –3 : Details of Exploration Activities in Odisha, 2019-20

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Iron Ore							
Mayurbhanj	Badampahar – Suleipat – Jashipur area	-	-	-	-	131	Reconnaissance survey(G4) was carried out for Iron Ore in BIF and titanium –vanadium bearing magnetite ore in Badampahar –Suleipat –Jashipur area, Mayurbhanj district. The study area is divided into Domain-1 covering 60 sq km area and Domain-2 covering 40 sq km area. Geologically, the study area consists of typical greenstone belt of rocks (metamorphosed volcano sedimentary sequence) of Precambrian age and it lies in the northern fringe of the Similipal complex and separates the western granite terrain represented by Singhbhum granitoids from Mayurbhanj granite in East. In Domain-1, total 4 nos. of NE-SW trending Banded Magnetite Quartzite bands are delineated (Band-1, Band-2, Band-3 and Band-4) having strike length of 512 m, 1.3 km, 3.1 km and 3.6 km, respectively. These bands are observed to appear as curvilinear discrete bodies dipping 65Ú towards NW. In Domain-2, 2 nos. of massive magnetite bodies surrounded by Mayurbhanj gabbro are delineated which are having strike length of 281 m and 318 m, respectively near Mayurbeka and Kesam villages. In Domain-1, the average widths of Band-1, 2, 3 and 4 are 30 m, 35 m, 20 m and 25 m, respectively. Whereas in Domain-2, the average width of massive magnetite bodies is 50 m. A total of 96 nos. of BRS, 10 nos. of PCS and 25 nos. PTS are collected. From the analytical data received so far from chemical lab, it is observed that in Domain-1, the concentration of Fe in Band-1, 2, 3 and 4 are ranging from 18.96-45.21%, 14.86-38.47%, 23.11-59.96% and 24.13-59.80%, respectively. The TiO2 concentration in Band-1 and 2 is restricted within 0.01% but ranges from 0.01- 0.06% in Band-3 and 0.01-0.02% in Band-4. V concentration is <20 ppm in all of these four bands.
Iron Ore							
Kendujhar	Kendudihi North Block	1:2000	1.45	-	-	-	Preliminary exploration(G3) was carried out for Iron Ore in Kendudihi North Block, Kendujhar district.

(contd)

Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling	Remarks
		Scale	Area (sq km)	No. of boreholes	Meterage	(No.)	Reserves/Resources estimated
							The present area of study Kendudihi North Block lies within the valley part of Jamda-Koira horse-shoe synclinorium of Bonai-Kendujhar iron ore belt (B-K Belt) of Kendujhar district, in parts of Toposheet Nos.73G/5 and 73F/8. An area of 1.45 sq km was mapped on 1:2000 scale. The area constitutes a NE-SW trending broad valley plain with thick soil cover on either side by hills. The different litho units exposed in the area are hard laminated iron ore, laterite, float ore of laterite, shale/phyllite and soil. Hard laminated iron ore, Fe-laterite, float ore, shale/phyllite exposes in the higher elevation of the hillock. The ore type is mainly haematite. Manganese ore occurrences are observed at nala section in the central portion and at old pit in southern part of the block. A total of 242.15 m drilling has been completed under G-3 stage at 400 m X 400 m interval. 30.00 m cumulative thickness of lateritized iron (as per VE low grade iron) and 8.85 m Mn horizon at 54.75 to 62.60 m depth has been intersected in borehole ODKN-1 and 71.20 m thick iron ore (as per VE low grade iron) has been intersected in borehole ODKN-2 respectively. The borehole ODKN-3 is under progress. The mineralized zone intersected comprises lateritised iron ore with minor HLO, SLO, purple powdery ore with intercalations of shale/ferruginous shale and Manganese ore.
Iron and Manganese Ore							
Kendujhar	Uliburu area	1:2000	0.55	-	-	-	Reconnaissance survey was carried out for Iron and Manganese Ore in Uliburu area, Kendujhar, District. A total 0.55 sq km area was covered on 1:2000 scale and 7.7 sq km area was covered on 1:5000 scale. During the course of mapping, numbers of old quarries in the adjacent area were studied to appreciate thedisposition of ore bodies and their association with the other rock units. In some quarry sections, the thickness of laterite profile varies from 5 to 30 m. Western part of
		1:5000	7.7	-	-	-	

(contd)

Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							the mapped area mostly comprises with phyllite, amygdular meta – basalt and quartzite. A small outcrop of pillow basalt is also seen in a nala cutting at the eastern margin of the Boraiburu village.Central part of the mapped area is low lying nature which is soil covered. The contact between the shale and the BHQ is not exposed in the area due to thick soil cover. Hence, the nature of the contact and the relationship between shale and BHJ is conjectural. Lateritic iron ore exposed in the eastern fringe of the block has assayed 40 – 50% Fe. The block appears to hold not much promise from the point of view of iron mineralisation except the eastern part of the block. The item was initially taken up under G3 stage and concluded as G4 stage in F.S. 2019- 20.
Iron Ore							
Kendujhar and Sundargarh	Gandhalpada West block	-	2.0	-	-	-	General exploration (G2) was carried out for Iron Ore in Gandhalpada West block, Kendujhar and Sundargarh districts. It covers 2.0 sq km area. The various lithotypes exposed are insitu and fragmentary iron ore, shale, laterite and float ore. The northern part of the block is covered by soil/alluvium. The iron ore bodies are exposed in the form of hard and soft laminated ore and lateritic ore in the central part of the block. A total of 2420 m of drilling was carried out in 24 boreholes at 200 m X 200 m grid interval. Out of 24 nos. of boreholes drilled, 19 nos. of boreholes intersected ore zones. The cumulative thickness of iron ore zone in the boreholes varies from 15 m (borehole OKGW-22) to 73 m (borehole OKGW-3). The northeastern part of the block is thickly mineralised than the southwestern part. The intersected iron ore zones mainly comprise of powdery iron ore, blue dust, soft laminated ore and some hard-laminated ore/lumpy iron ore pieces with minor shale intercalations. The ore mineral is mostly hematite with (contd)

Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							minor amount of goethite and limonite. In addition to the iron ore, the boreholes OKGW-5, OKGW-10, OKGW-11, OKGW-12 and OKGW-16 have intersected 22.00 m, 50.40 m, 0.50 m, 11.60 m and 12.00 m of lignite, respectively. As per received chemical result and visual estimate, the total resource of the block at 45% Fe cut-off is 53 MT. In addition, tentative resource of lignite estimated based on the thickness of lignite zone intersected in the boreholes is 1.346 MT.
Iron Ore							
Kendujhar	Putulipani Block	-	-	-	-	46	General exploration (G2) was carried out for Iron Ore float in Putulipani Block, Kendujhar district. The Putulipani Block falling in the western flank of Gandhamardan iron ore ridge constitute part of South Eastern limb of Bonai Synclinorium. Metabasic rocks, iron ore and shale are the major litho variants making up of the block. The slope of the ridge is having float ore accumulation of varying thickness from less than 1 m to as thick as 15 m. The float ore is lateritised and the resultant top layer is forming up of hematite pebbles, cobbles, boulders with a lateritised ferruginised matrix. Field work for float ore resource estimation was tried with collection of vertical groove samples (VGS) from mining benches, pit/trench sampling in the non mined parts, collection of grab samples from the ore stacks left over the mining benches. 35 nos off VGS, 1 nos of PTS and 10 nos of grab samples were collected.
Iron Ore							
Kendujhar	Laupada Block	-	-	-	-	-	General exploration(G2) was carried out for Iron Ore float in Laupada Block, Kendujhar district. Laupada block forms part of the Kendujhar district, Odisha in Toposheet no 73G/10. The block forms part of Lower Bonai group. Meta shale and meta basalts are the dominant lithotype present in the block. Varying thickness of laterite/lateritised float ore is masking the litho units. As

(contd)

Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							part of this G2 stage float ore estimation pit-trench sampling, vertical groove sampling, grab sampling of the ore stacks is carried out. The float ore occurence is eratic and appears to be former point bar type deposit in the valley. The area is devoid of mining benches, hence mostly pitting, trenching and PTS sampling was carried out. The float ore thickness is also eratic may be due to uneven ancient valley floor and gradient.
Manganese Ore							
Rayagada	Mandhara block	1:2000	-	-	-	50	Reconnaissance survey was carried out for Manganese Ore in Mandhara block, Rayagada district. During detailed mapping on 1:2000 scale, mainly three litho variants quartzite, khondalite and manganese were identified and mapped. In the study area, manganese occurs within khondalite in detached and discontinuous manner in two different varieties i.e. lateritic and siliceous. There are two major manganese bands and three minor manganese bands present in the study area. The cumulative length of the major bands - I and II is 700 & 450 m and width varies from 1 to 16 m & 2 m to 25 m, respectively. The minor manganese bands were named as minor manganese band I, II and III from north to south. Each band occurs at a distance approximately 125 m from each other. A total of 50 nos. of bedrock samples were collected from the available outcrops of manganese. Pitting and trenching was carried out for 90 cu. m and 42 nos. of samples were collected from the manganese present in the pits / trenches. The chemical analytical results of 25 nos. of trench samples collected from 4 nos. of trenches have been received which shows that the manganese varies from 0.42% to 24.42% with a weighted average of 14.19% Mn. Project was initially proposed as a G3 stage exploration with drilling but drilling couldn't be taken up due to non-availability of Forest permission and item was downgraded to G4 stage.

(contd)

Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Manganese Ore							
Koraput	Devjholla block	1:2000	0.96	-	-	115	Reconnaissance survey(G4) was carried out for Manganese Ore in Devjholla block, Koraput district. The exploration block falls under parts of Survey of India toposheet no. 65M/04. Devjholla block is located in the Central part of the Eastern Ghat Mobile Belt (EGMB). Detailed mapping of 0.96 sq km area was carried out on 1:2000 scale using Total Station in Devjholla Block. Project was initially proposed as a G3 stage exploration with drilling but drilling couldn't be taken up due to nonavailability of Forest permission and item was downgraded to G4 stage. Litho units mapped during the detailed mapping are Khondalite, Ferruginous quartzites, manganiferous laterite and Manganese ore. Manganese ore in Devjholla block is lenticular in shape, discontinuous in nature and are associated with the Khondalite and Ferruginous quartzite. The ores are composed of pyrolusite and psilomelane. Manganese band is structurally conformable to the attitude of foliation of Khondalite. Based on detailed mapping, from north to south, four distinct manganese ore zones were mapped named as Zone 1 to zone 4 with cumulative strike length of about 400 m. Zone 1 has cumulative strike length of 244 m with average width of 16 m, zone 2 has strike length of 35 m with average width of about 5 m, zone 3 has strike length of 83 m with average width of 12 m and zone 4 has strike length of 28 m with average width of about 5 m. A total of 115 nos. of samples from bedrock and trenches have been sent for chemical analysis and results of the 19 BRS sample have been received which has shown Mn content varying from 8.61% to 30.97%.
Manganese Ore							
Kalahandi	Taprang Block in the Eastern Ghat mobile belt,	1:2000	1.0	-	-	-	Reconnaissance survey(G4) was carried out for Manganese in Taprang Block in the Eastern Ghat mobile

(contd)

Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							belt, Kalahandi district. An area of 1 sq km have been mapped on 1: 2000 scale along with geophysical (gravity and magnetic) survey to delineate manganiferous bands. Project was initially proposed as a G3 stage exploration with drilling but drilling couldn't be taken up due to non-availability of Forest permission and item was down-graded to G4 stage. The Taprang block comprises lithoassemblage of calc-silicate granulite, coarse grained quartzite ± garnet, ferruginous and/or manganiferous quartzite and very limited occurrence of khondalite belonging to Khondalite Suite of rocks of Eastern Ghat Mobile Belt with some later intruded quartz veins. Manganese ore bearing horizons have been delineated in two localities in the Taprang Block. One 150 m long, thin band of manganese ore is mapped in the northern part of hill top occurring within ferruginous and/or manganiferous quartzite, striking almost E-W. In the southern part, manganese ore body is discontinuous in nature. The manganese ore bodies occur as discontinuous bands, lensoidal bodies, pockets, fracture filling and stringers. Manganese mineralisation in the mapped area is of remobilised type of deposit. The major manganese ore minerals of the area are pyrolusite, manganite, psilomelanecryptomelane and braunite. Goethite (associated with psilomelane-cryptomelane) and graphite (associated with pyrolusite) occur at places.
Directorate of Geology, Odisha							
Manganese Ore							
Keonjhar	Roida-D area	1:12500	-	10	-	143	In Odisha, a exploration in Roida-D area, Keonjhar district was carried out with the objectives to assess manganese ore resources with its grade. Two irregular sporadic outcrops were delineated. The manganese exposure at the central part has the maximum length of 10 m and average width of 4 m. The cumulative thickness of ore body encountered in boreholes is about

(contd)

Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
							47.55 m. The study involved drilling of 10 boreholes, at grid spacing of 100 m * 50 m, to a total depth of 354 m and collection 143 samples. Exploration is continuing in the area.
Keonjhar	Tentuliguda area	1:12500	121	-	-	37	Tentuliguda area, Keonjhar district. Exploration was taken up to assess manganese ore resources in the area. One manganese ore body admeasuring 15 m * 30 m has been located at west of Bagchuan village. The study involved geological mapping of 121 sq.km area on 1:12500 scale and collection of 37 samples. Exploration suspended due to local problems in the area.
MECL							
Manganese Ore							
Bolangir	Tamiya	1:4000	8.05	-	-	893	In Odisha, a G2 stage exploration in Tamiya village, Patangarh tehsil, Bolangir district was carried out with the broad objectives to carry out detailed geological mapping and estimate indicated category resources of manganese ore in the area. The study involved mapping of 8.05 sq.km area on 1:4000 scale with collection of about 893 samples along with a trenching and 5 pittings of dimension 1m x 1m x 1m. Resources in the area has been estimated at about 633 thousand tonnes of manganese ore with 23.04% Mn under indicated category.
Bolangir	Rengali block	1:12500	1.83	-	-	1556	A G2 stage exploration was carried out over an area of 1.831 sq.km in Rengali block, tehsil & district of Bolangir with the broad objectives to carry out detailed geological mapping and estimate indicated category resources of manganese ore in the area. The study involved mapping of 1.83 sq.km area on 1:12,500 scale with collection of different types of 1,556 samples along with a trenching and 5 nos of pittings admeasuring 1m x 1m x 1m. Resources in the area has been estimated at 328 thousand tonnes of manganese ore with 21.37% Mn, 15.82% Fe and 0.28% P under indicated category.

(contd)

Table – 3 (contd)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Limestone							
Bolangir	Telipadar	-	-	11	404.00	113	-
Quartz & Quartzite							
Mayurbhanj	Purunapani-Tilodaia-Tilakchuin	1:5000	0.96	-	-	23	-
Jharsuguda	Bhikampali & Kanaktora	1:5000	0.51	-	-	48	-
Sundargarh	Soroda	1:5000	0.60	-	-	108	-
Quartz							
Kalahandi	Dabjharan, Junagarh subdivision	1:5000	0.105	-	-	21	-
Bolangir	Burbuda, Biramitrapur subdivision	1:5000	0.50	-	-	38	-
Graphite							
Dhenkanal	Bandhabhuim	1:2000	0.445	-	-	7	-
Dhenkanal	Karabira	1:5000	0.36	8	468.00	-	-
Rayagada	Khalpadar	1:5000	0.54	12	259.30	133	-
Decorative Stone and other minor minerals							
Gajapati	Endrima village	1:25000	100.00	-	-	16	-
	Mohana tehsil	1:4000	0.35	-	-	-	
Kandhamal	Pabura village	1:25000	-	-	-	12	-
Pyrophyllite							
Keonjhar	Jamudiha	1:5000	0.45	3	39.05	67	-
Pyroxenite/Serpentinite							
Keonjhar	Kaliahata	1:10,000	30.00	3	39.05	120	-
	-	1:2000	3.6	-	-	-	

(contd)

Table – 3 (concld.)

Agency/ Mineral/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
China clay							
Mayurbhanj	Dumuria	1:2000	0.5	30	621.00	441	-
Dhenkanal	Bhairpur	1:10,000	100.00	-	-	12	-
	-	1:5000	0.35	-	-	-	

Table - 4 : Mineral Production in Odisha, 2017-18 to 2019-20 (Excluding Atomic Minerals)

(Value in ₹'000)

Mineral	Unit	2017-18			2018-19			2019-20 (P)		
		No. of mines	Qty	Value$	No. of mines	Qty	Value$	No. of mines	Qty	Value$
All Minerals		**134**		**196957766**	**134**		**305305092**	**129**		**328412227**
Coal	'000t	-	143328	-	-	144312	-	-	143016	-
Bauxite	t	5	11447741	7781436	5	15413642	11000292	5	15483307	10649347
Chromite	t	21	3480924	32036923	22	3970691	36850747	20	3929260	33326588
Iron Ore	'000t	62	102186	150845108	62	113119	251111210	63	146773	278322931
Manganese Ore	t	33	516862	3497593	31	476821	3048997	26	537742	3409984
Garnet (abrasive) %	t	-	34170	242504	-	38376	545745	-	-	-
Graphite (r.o.m.)	t	5	14674	7172	3	23199	18259	5	12565	37126
Iolite	kg	-	-	-	3	73	684	3	90	579
Sillimanite	t	1	16698	111376	1	17930	143870	-	-	-
Limestone	'000t	7	4968	1578887	7	5289	1728521	7	5627	1808905
Sulphur #	t	-	231075	-	-	239344	-	-	253697	-
Minor Minerals @		-	-	856767	-	-	856767	-	-	856767

Note: *The number of mines excludes Fuel and Minor minerals.*
$ Excludes the value of Fuel minerals.
% Associated with Sillimanite.
 # Recovered as by-product from oil refinery.
@ Figures for earlier years have been repeated as estimates because of non-receipt of data.

Mineral-based Industry

The present status of each mineral-based industry is not readily available. However, the important large and medium mineral-based industries in organised sector in the State are given in Table - 5.

Table – 5: Principal Mineral-based Industries

Industry/plant	Capacity ('000 tpy)
Aluminium/Alumina	
Hindalco Industries Ltd, Hirakud	215 (aluminium)
Hindalco Industries Ltd, Aditya Aluminium, Lapanga, Distt Sambalpur	360 (aluminium)
NALCO, Damanjodi, Distt Koraput	2275 (alumina)
NALCO, Angul	460 (aluminium)
Utkal Aluma, Rayagada	1500 (alumina)
Vedanta Aluminium Ltd, Lanjigarh, Distt Kalahandi	2000 (alumina) 1500(Venadium)
Vedanta Aluminium Ltd, Jharsuguda, Distt Sambalpur	1750 (aluminium)
Asbestos Products	
UAL Industries Ltd, Korian, Distt Dhenkanal	NA
Konark Cement & Asbestos Industries Ltd, Bhubaneshwar	NA
Cement	
ACC Ltd, Bargarh Cement Ltd, Bargarh	2140
Ultra-Tech Cement Ltd, Jharsuguda (G)	2600
OCL India Ltd, Rajgangpur, Distt Sundargarh	4000 1064(Refractory) 2900(Clinker)
OCL India Ltd, Kapilas (G). Cuttack	1350
Toshali Cements Pvt Ltd, Ampavalli, Distt Koraput	200
Ceramics	
Prabhu Ceramics & Minerals Pvt Ltd, Majhipali, Rengali, Sambalpur	24(Acidic Ramming Mass) 9.6(EBT Filling Mass)
Chemical	
Arrow Minerals & Metals Pvt. Ltd,Vejidihi, Banspal	1.8(Manganese Oxide) 2.25(Manganese dioxide powder)
Chrome Concentrate	
K L Resources PVT. Ltd, Sundaria, Dharmsala	74.7

(contd)

Table - 5 (contd)

Industry/plant	Capacity ('000 tpy)
Maharaja Minerals Pvt. Ltd, Soso Hatadidi	60
Anand Exports, Nimmapali, Sukinda	60
Fertilizer	
IFFCO, Paradeep	NA
Paradeep Phosphates Ltd, Paradeep	NA
SAIL Fertilizer Plant, Rourkela, Distt Sundargarh	NA
Graphite Concentrate Pradhan Industries , Katra, Kana Laxmipur	2.88
Iron & Steel	
SAIL, Rourkela Steel Plant, Rourkela, Distt Sundargarh	5300 (sinter) 3470(pig iron) 4400 (crude/liquid steel) 85 (tin plates)
Bhushan Power & Steel, Sambalpur	1000 (sinter) 2420(crude steel)
Bhushan Steel Ltd, Dhenkanal	5625 (crude Steel) 6680(Sinter) 3200(Finished steel)
Jindal Stainless Steel Ltd, Kalinganagar, Gadapur	1000 (Stainless steel) 250 (ferro alloys)
Neelachal Ispat Nigam Ltd, Khurunti, Godigotha, Sarangapur	1710 (sinter) 855 (pellets) 1100(Pig Iron) 920 (crude/liquid steel) 900(Semifinised Steel) 13 (A/S) 35(Crude Tar)
OCL India Ltd, Lamloi, Distt Sundargarh	120 (sponge iron) 85 (billets)
Orissa Sponge Iron Ltd, Palaspanga, Distt Keonjhar	250(Ssponge iron) 100 (steel ingot)
Shree Jagannath Steel & Power Ltd Uliburu Barbil	115.5 (Sponge iron) 112.86(M S billets)
Visa Steel Ltd, Kalinganagar, Distt Jajpur	225 (pig iron) 300 (sponge iron) 500 (special steel)
Tata Steel Ltd Duburi Sukinda	3200(pig iron) 3000 (crude/liquid steel) 5750 (sinter)
Manhole Cover Utkal Modular, Cover) Kaurmundu	10.752(GI. Manhole 2.73(DI. Manhole Cover)
Pellet	
Arya Iron & Steel Co. Pvt Ltd, Barbil.	1200 (pellets)
Essar Steel Ltd, Paradip	6000 (pellets)

(contd)

Table - 5 (contd)

Industry/plant	Capacity ('000 tpy)
Jindal Steel & Power Ltd, Barbil.	9000 (pellets)
Pro Minerals Pvt. Ltd,Basantpur, Jhumpura	1000 (pellets)
Rexon Strips Ltd, Kumakela, Distt Sundargarh	300 (pellets) 60 (sponge iron) 25 (M. S. ingots)
Shivom Mineral Limited Kusumdih, Koira	120 (Lump CLO)
Tata Steel Ltd, Kalinga nagar works, Kalinganagar, Odisha	2800
Pig Iron	
IDCOL Kalinga Iron Works Ltd, Barbil, Distt Keonjhar	180
IKIW. Ltd, Matkambeda Barbil	170
Sponge Iron	
Action Ispat & Power (P) Ltd, Pandripather, Distt Jharsuguda	250
Adhunik Metaliks Ltd, Chandrihariharpur, Distt Sundargarh	270
Aarti Steel limited, Ghantikhal, Athagarh, Cuttack	320
Bhaskar Steel & Ferroalloys Pvt. Ltd, Badtumkela Rajamunda	120
Beekay Steel & Power Ltd, Uliburu, Distt Barbil.	115.5
Bhusan Steels Ltd, Meramandali, Distt Dhenkanal	900
Brand Steel & Power Pvt. Ltd, Murusuan, Keonjhar	60
Crackers India (Alloy) Ltd, Gobardhanpur, Distt Keonjhar	73
Dinabandhu Steel & Power Ltd, Kalinganagar, Distt Jajpur.	60
Ganesh Sponge Pvt Ltd, Krushnachandrapur, Distt Angul	90
Jay Iron & Steel Ltd, Balanda, Rourkela, Distt Sundargarh	60
Jindal Steel & Power Ltd, Nisha, Dist. Angul	1800
Kamaljit Singh Alluwalia Steel & Power Div. Barpada, Barbil	300
L. N. Metallics Ltd, Sripura Jharsuguda	60
MGM Minerals Ltd, Forest Park, Bhubaneswar	105
Rungta Mines Ltd, Unit-I, Karakola, Barbil, Distt Kendujhar Unit-II, Kamand, Koira, Distt Sundargarh	 180 556.5 277.2 (Semi Fin. Steel)

(contd)

Table - 5 (contd)

Industry/plant	Capacity ('000 tpy)
SMC Power Generation Ltd, Jharsuguda	200 350(Billet)
Scaw Industries Pvt. Ltd, Gundichapara, Distt Dhenkanal	100
Sponge Udyog Pvt. Ltd, Jai Bahal, Lathikata	60
Sree Metallic Ltd, Loidapada, Distt Kendujhar	300
Suraj Products Ltd, Barpalli, Distt Sundargarh	36
Swastik Ispat pvt. Ltd	45
Tata Sponge Iron Ltd, Joda, Distt Kendujhar	465
Vikram Pvt Ltd, Tumkela, Distt Sundargarh	60
Viraj Steel & Energy Ltd, Gurupali, Rengali	220
Vishal Metallics Pvt. Ltd, Barahamusa, Bonai	60
Yedani Steel & Power Ltd, Manitra Donagadi	60
Ferro Alloys	
Aarti Steel limited, Ghantikhal, Athagarh, Cuttak	50 (Ferrochrome 200 (Finished Steel)
Balasore Alloys Ltd, Balgopalpur, Distt Balasore	145 (H. C. Ferro chrome)
FACOR, Charge Chrome Plant, Randia, Distt Bhadrak	65
Ferro alloy Corporation Ltd, Bhadrak	75
IDCOL Ferro Chrome & Alloys Ltd, Distt Jajpur	18
Indian Metal & Ferro alloys Ltd (Indian Charge Chrome Ltd, Choudwar	168
Indian Metals & Ferro Alloys Ltd, Therubali, Distt Cuttack	116.4
Jeypore Sugar Co. Ltd, Rayagada	22.5
Jindal Stainless Ltd, Kalingnagar, Jajpur	250
Nav Bharat Ventures Ltd, Ferro Alloys Plant, Khargprasad, Distt Dhenkanal	75
Rohit Ferro-Tech Ltd, Kalinganagar, Distt Jajpur	110
Sagar Mining & Metal Industries Pvt. Ltd, Nayagarh ,Barbil	3.6 (L.C. Fe/mn) 6.0 (M. C Fe/mn)
Stork Ferro& Mineral Industries Pvt. Ltd, Somanthpur, Remuna	25 (Ferro chrome)
Tata Steel Ltd (Ferroalloys and Minerals Div.), Joda, Distt Kendujhar	50.4
Tata Steel Ltd (Ferroalloys and Minerals Div.), Bamnipal, Distt Kendujhar, Jhumpura	65
Tata Steel Ltd (Ferroalloys and Minerals Div.), Distt Cuttack	50

(contd)

Table - 5 (contd)

Industry/plant	Capacity ('000 tpy)
Tata Steel Ltd (Ferro Chrome plant Chamakhandi.), Chatrapur	55
T.S.Alloys Ltd, Anantpur, (Rawmet Ferrous Industries Ltd), Cuttack	52
Visa Steel, Kalinganagar (Manganese oxide)	180
Refractory	
IFGL Refractory Ltd, Kalunga, Distt Sundargarh	80000 pc (continuous casting refractories)
Khemka Refractories (P) Ltd, Khatukhura, Dhenkanal	35.4
Orissa Industries Ltd, Lakhikata, Distt Sundargarh	125
Kalinga Refractories, Brundammal, Badmal, Jharsuguda	7.2 (Fire Bricks) 1.2 (F. C. Mortar)
Maruti Monolithics Pvt. Ltd, Gopalpur, Tangi Choudwar	2.0(Basic fettling Mass) 2.75(Basic mortar)

(contd)

Table - 5 (concld)

Industry/plant	Capacity ('000 tpy)
Total solution, Piplimal, Lakhanpur	10 (Mag- chrome Powder) 10 (Mag- chr. Powder, normal) 10 (Mill scale Powder)
Orissa Industries Ltd, Barang, Distt Cuttack	19 5 (DBM)
TRL Krosaki Refractories Ltd, Belpahar, Distt Jharsuguda.	247.89 18 (Taphole clay)
Silicon Carbide	
Indian Metals & Carbide Ltd, Therubali	NA
Synthetic Rutile	
IREL, Orissa Sands Complex, Ganjam	100
Petroleum Refinary	
IOCL Paradeep Odisha	15000

(G): *Grinding units.*

Note: *Data, not readily available for fertilizer and cement industries on respective websites.*