

# CHAPTER 10

## MINERAL RESOURCES

10.01 Orissa is endowed with varieties of mineral resources and occupies an important position in India's mineral map. The reserves of major minerals like chromite, nickel, bauxite, iron-ore and coal in Orissa were 97.36%, 95.09%, 49.74%, 33.91% and 24.37% respectively of the total deposits in India during 2003-04 as indicated in Table 10.1. Other minerals like china clay, fire clay, lime stone, quartz, precious and semi precious stones, copper, manganese, graphite, titanium, vanadium etc. are also available in the State.

*Table 10.1*

***Mineral Reserves in Orissa and India, 2003-04***

(in million tonne)

Sl. No.	Name of the Mineral / ore	Reserve in Orissa	Reserve in India	Percentage to All India reserve
1	2	3	4	5
1	Iron ore	4177	12317.3	33.91
2	Chromite	111	114	97.36
3	Coal	51571	211593.6	24.37
4	Bauxite	1530	3076	49.74
5	Lime stone	2224	169941	1.30
6	Dolomite	882	7349	12.0
7	Fire clay	177	706	25.07
8	China clay	314	2353	13.34
9	Nickel ore	174.5	183.5	95.09
10	Vanadiferous magnetite	2.5	12.0	20.83
11	Manganese	116	406	28.57
12	Mineral sand	86	266	32.33
13	Graphite	4.6	6.0	76.66
14	Pyrophyllite	4.8	22.6	21.24
15	Lead Ore	1.9	176	1.08
16	Talc – Soap stone	1.1	327	0.34

*Source : Directorate of Geology, Orissa, Bhubaneswar*

10.02 The total production of minerals and ores in the State during 2003-04 was 1082.83 lakh tonnes valued at Rs.5198.53 crore, as against the production of 873.62 lakh tonnes valued at Rs.3694.17 crore in 2002-03, registering an increase of 23.95% in quantity and 40.72% in value. Table 10.2 indicates the trend in total mineral production in the State and its value from 1999-2000 to 2003-04.

**Table 10.2**  
**Production and Value of Minerals / Ores in Orissa**

Sl. No.	Year	Production (in lakh tonne)	Percentage increase over previous year	Value (Rs. in crore)	Percentage increase over previous year
1	2	3	4	5	6
1	1999-00	644.87	1.66	2605.05	10.12
2	2000-01	689.24	6.88	2776.15	6.57
3	2001-02	749.81	8.79	2910.47	4.84
4	2002-03	873.62	16.51	3694.17	26.93
5	2003-04(P)	1082.83	23.95	5198.53	40.72

*P : Provisional*

*Source : Directorate of Mines, Orissa, Bhubaneswar*

10.03 Production figures of some important minerals and ores in the State from 1999-2000 to 2003-04 are given in Table 10.3. The table shows that the production of minerals and ores in the State has increased by 23.95% during 2003-04 over 2002-03. The production of coal and metallic minerals has increased by 15.70% and 39.54% respectively and in case of non-metallic minerals it has increased by 10.66% during this period.

**Table 10.3**  
**Production of Minerals in Orissa from 1999-2000 to 2003-04**

(lakh tonne)

Mineral/Ore	1999-00	2000-01	2001-02	2002-03	2003-04(P)
1	2	3	4	5	6
<b>A. Fuel</b>					
i) Coal	435.4	448.1	478.0	520.3	602.0
<b>Total (A)</b>	<b>435.4</b> <b>(0.16)</b>	<b>448.1</b> <b>(2.92)</b>	<b>478.0</b> <b>(6.67)</b>	<b>520.3</b> <b>(8.85)</b>	<b>602.0</b> <b>(15.70)</b>
<b>B. Metallic</b>					
i) Bauxite	28.8	29.1	36.1	49.3	49.4
ii) Chromite	16.9	19.3	17.6	32.9	28.8
iii) Iron-ore	120.5	143.5	167.9	222.6	348.9
iv) Manganese	5.3	5.5	5.4	6.3	7.0
v) Lead Ore	0.9	0.7	0.2	-	-
<b>Total (B)</b>	<b>172.4</b> <b>(4.87)</b>	<b>198.1</b> <b>(14.91)</b>	<b>227.2</b> <b>(14.69)</b>	<b>311.1</b> <b>(36.93)</b>	<b>434.1</b> <b>(39.54)</b>
<b>C. Non-Metallic</b>					
i) China clay	0.1	0.1	0.1	0.1	0.1
ii) Dolomite	11.0	12.4	14.5	11.5	12.7
iii) Fire clay	0.6	0.5	0.4	0.5	0.6
iv) Graphite	0.8	0.8	0.4	0.5	0.3
v) Mineral sands	2.0	2.1	2.1	1.5	2.3
vi) Lime Stone	18.5	21.2	21.5	23.0	22.4
vii) Phyro phyllite	0.5	0.4	0.4	0.4	0.8
viii) Quartz	0.5	0.4	0.2	0.3	0.3
ix) Quartzite	0.4	0.5	0.4	0.9	1.0
x) Other minerals	2.6	4.6	4.6	3.5	6.2
<b>Total (C)</b>	<b>37.0</b> <b>(5.11)</b>	<b>43.0</b> <b>(16.22)</b>	<b>44.6</b> <b>(3.72)</b>	<b>42.2</b> <b>(-5.38)</b>	<b>46.7</b> <b>(10.66)</b>
<b>Grand total (A+B+C)</b>	<b>644.8</b> <b>(1.66)</b>	<b>689.2</b> <b>(6.88)</b>	<b>749.8</b> <b>(8.79)</b>	<b>873.6</b> <b>(16.51)</b>	<b>1082.8</b> <b>(23.95)</b>

P: Provisional

N.B. : Figures in brackets indicate percentage change over previous year

Source : Directorate of Mines, Orissa, Bhubaneswar

10.04 Several mineral based industries have been set up in Orissa which include Rourkela Steel Plant (RSP), aluminium plants by INDAL and National Aluminium Company

(NALCO), three charge chrome plants at Brahmanipal, Bhadrak and Choudwar by Orissa Mining Corporation (OMC), Ferro Alloys Corporation (FACOR) and Indian Charge Chrome Ltd. (ICCL) respectively. At Theruvalli in Rayagada district, Indian Metal and Ferro-Alloys (IMFA) has set up a plant for production of charge chrome / ferro chrome. The other important mineral based industries established include two sponge iron plants in Keonjhar district, a refractory in Dhenkanal district and mineral sands separation and synthetic rutile plants of Indian Rare Earth Ltd. at Chhatrapur in Ganjam district. Several cement plants have been set up in the State and three coal based thermal power plants have been set up at Talcher, Kaniha and Banharpalli. In addition, NALCO, RSP, ICCL, INDAL etc. have set up their own coal based captive power plants. The liberalisation policy has opened up possibilities for large scale mineral exploration and establishment of mineral-based industries in the State.

### **VALUE OF MINERALS PRODUCED**

10.05 The value of minerals and ores produced in the State during 2003-04 was Rs.5198.53 crore constituting 8.31% of the total value of production in the Country as against 6.28% in Madhya Pradesh, 8.07% in Gujarat, 6.77% in Andhra Pradesh, 4.51% in Maharashtra (Annexure 10.1). The value of minerals and ores produced in the State has increased from Rs.2910.47 crore during 2001-02 to Rs.5198.53 crore in 2003-04 registering an increase of 78.61%. Out of the total value of production during 2003-04, the share of coal, metallic and non-metallic minerals is 55.73%, 41.16% and 3.11% respectively. Table 10.4 indicates the value of fuel (coal), metallic and non-metallic minerals produced in Orissa and India for the years for 2001-02 to 2003-04.

**Table 10.4**

***Value of Minerals Produced in Orissa and India***

(Rs. in crore)

Sl. No.	Type of minerals	ORISSA			INDIA		
		2001-02	2002-03	2003-04(P)	2001-02	2002-03	2003-04(P)
1	2	3	4	5	6	7	8
1	Fuel (Coal)	1900.99	2070.82	2897.30	48547.56	45407.25	54818.20
2	Metalic	846.89	1501.68	2139.56	3806.22	3910.16	5486.14
3	Non-Metalic	162.59	121.66	161.67	1998.40	2009.27	2221.13
<b>Total</b>		<b>2910.47</b>	<b>3694.16</b>	<b>5198.53</b>	<b>54352.18</b>	<b>51326.68</b>	<b>62525.51</b>

*P : Provisional*

*Source : Directorate of Mines, Orissa, Bhubaneswar  
Regional Controller of Mines, Bhubaneswar.*

### **MINERAL EXPORTS**

10.06 During 2003-04, 76.40 lakh tonne of minerals and ores valued at Rs.1186.53 crore were exported from the State as against 58.67 lakh tonne valued at Rs 642.20 crore in 2002-03. Mineral wise export figures from 1999-2000 to 2003-04 are given in Table 10.5. From the tabular analysis it is clear that the export of chromite and iron ore increased regularly except in 2003-04 in case of chromite it declined by 1.18% over the previous year.

**Table 10.5**

#### **Export of Minerals / Ores from Orissa**

(Quantity – in lakh tonne)

(Value – Rs. in crore)

Sl. No	Items	1999-2000		2000-01		2001-02		2002-03		2003-04	
		Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
1	2	3	4	5	6	7	8	9	10	11	12
1	Chromite	6.64	252.17	7.08	185.85	10.27	255.71	11.82	267.40	11.68	264.34
2	Iron Ore	9.96	78.68	28.25	222.88	35.46	272.33	46.55	374.28	61.93	852.43
3	Ilmenite	1.54	56.63	1.30	45.09	0.31	10.75*	0.30	0.52*	2.74	56.08
4	Zincon	-	-	-	-	-	-	-	-	0.02	3.60
5	Mnganeese	-	-	-	-	-	-	-	-	0.03	10.08
<b>Total</b>		<b>18.14</b>	<b>387.48</b>	<b>36.63</b>	<b>453.82</b>	<b>46.04</b>	<b>538.79</b>	<b>58.67</b>	<b>642.20</b>	<b>76.40</b>	<b>1186.53</b>

\* Estimated Value upto Nov., 2002

*Source : Directorate of Mines, Orissa, Bhubaneswar*

10.07 Iron ore is abundantly available in the districts of Mayurbhanj, Sundargarh, Keonjhar and Jajpur. As assessed upto 2003-04, total reserve of iron ore in these districts is estimated at 4177 million tonne. Similarly, the total reserve of chromite ore in Orissa is of the order of 111 million tonne and manganese 116 million tonne. While chromite is mostly

available in Jajpur, Dhenkanal and Keonjhar districts, manganese deposits are available in Sundargarh and Keonjhar districts. Dolomite is available plentifully only in the district of Sundargarh.

10.08 There are two major coal bearing areas in the State which are currently being exploited, namely Talcher and the Ib Valley. The total reserve of coal in the State is estimated to be 51,571 million tonne out of which 602.01 lakh tonne valued at Rs.2897.30 crore was exploited during 2003-04. Table 10.6 shows district wise figures of quantity and value of major minerals exploited in Orissa during 2003-04.

**Table 10.6**

***District-wise Exploitation and Value of Major Minerals in Orissa, during 2003-04***

(Quantity – Lakh tonne)  
(Value – Rs. crore)

Sl. No.	District	Chromite		Coal		Iron-ore		Manganese ore		Bauxite	
		Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
1	2	3	4	5	6	7	8	9	10	11	12
1	Angul	-	-	420.96	2024.82	-	-	-	-	-	-
2	Dhenkanal	0.11	1.62	-	-	-	-	-	-	-	-
3	Jajpur	28.20	413.69	-	-	-	-	-	-	-	-
4	Jharsuguda	-	-	170.95	822.27	-	-	-	-	-	-
5	Keonjhar	0.57	8.39	-	-	257.39	1083.40	5.00	83.70	-	-
6	Mayurbhanj	-	-	-	-	2.27	9.56	-	-	-	-
7	Sundargarh	-	-	8.91	42.86	80.25	337.85	1.18	32.17	1.21	3.22
8	Koraput	-	-	-	-	-	-	-	-	48.17	128.13
<b>TOTAL</b>		<b>28.88</b>	<b>423.70</b>	<b>600.82</b>	<b>2889.95</b>	<b>339.91</b>	<b>1430.81</b>	<b>6.18</b>	<b>115.87</b>	<b>49.38</b>	<b>131.35</b>

Source : Directorate of Mines, Orissa, Bhubaneswar

10.09 Table 10.6 further shows that about 97.65% of chromite has been mined from Jajpur district and the balance of 2.35% from Keonjhar and Dhenkanal districts. Coal has been exploited to the extent of 70.06% in Angul district followed by 29.94% in Jharsuguda and Sundargarh districts taken together. Similarly manganese ore has been largely exploited in Keonjhar district (80.91%) followed by Sundargarh (19.09%). Iron ore has been largely

exploited in Keonjhar district (75.72%) followed by Sundargarh (23.61%), Mayurbhanj (0.67%). Besides, 97.55% of bauxite has been exploited from Koraput district followed by 2.45% from Sundargarh district during 2003-04.

### **REVENUE FROM MINERAL RESOURCES**

10.10 Mining revenue and cess collected during the year 2003-04 stood at Rs.550.76 crore as against Rs.443.53 crore in 2002-03 registering an increase of 24.18%. Table 10.7 shows the trend of revenue receipts from mining sector over the period from 1999-2000 to 2003-04. The table shows that the collection of mining royalty and other revenue from minerals has been increasing steadily. The mining sector is an important source of revenue for the State, but its proportion to the total own non-tax revenue of the State has fluctuated between 46.14% and 60.05% during the last five years.

**Table 10.7**

#### **Revenue Receipt from Mining Sector and Total Own Non-Tax Revenue of Orissa**

(Rs. in crore)

Year	Revenue receipts			Total own non-tax revenue of the State	Percentage of col.4 to col.5
	Cess on mining royalties	Mining royalties and other revenue from minerals	Total		
1	2	3	4	5	6
1999-00	0.38	320.08	320.46	716.5	44.73
2000-01	0.09	360.32	360.41	685.5	52.58
2001-02	0.07	376.38	376.45	691.8	54.42
2002-03(RE)	Nil	443.53	443.53	961.2	46.14
2003-04(BE)	0.007	550.76	550.76	917.1	60.05

*P : Provisional*

Source : 1. Directorate of Mines, Orissa, Bhubaneswar.

2. Annual Financial Statement, 2003-04 & 2004-05

### **MINERAL RESERVES IN ORISSA**

10.11 As per the latest assessment made by the Directorate of Geology, among the mineral deposit, the reserve of coal was the highest at 51,571 million tonne followed by iron ore (4177 million tonne), limestone (2224 million tonne), and bauxite (1530 million tonne) in Orissa.

10.12 Though Orissa is rich in minerals, exploitation is still not incommensurate with the potential. Enhanced rate of exploitation of different mineral reserves will not only improve the financial position of the State but also will be helpful in generating sizeable direct and indirect employment. The rate of exploitation of minerals / ores in the State was less than 1% in all cases in 2003-04 except graphite, chromite and china clay. Table 10.8 shows the total mineral reserves and the rate of exploitation of different minerals in Orissa for the years 2001-02 to 2003-04.

**Table 10.8**

**Total Mineral Reserves and Rate of Exploitation of different Minerals in Orissa  
from 2001-02 to 2003-04**

(in million tonne)

Sl. No.	Ore/mineral	Total reserves in 2003-04	Exploitation during			Rate of exploitation to total reserves (%)		
			2001-02	2002-03	2003-04	2001-02	2002-03	2003-04
1	2	3	4	5	6	7	8	9
1	Iron ore	4177	16.79	22.26	34.89	0.47	0.62	0.72
2	Chromite	111	1.76	3.29	2.88	0.96	1.80	1.13
3	Coal	51571	47.80	52.03	60.20	0.09	0.10	0.12
4	Bauxite	1530	3.60	4.93	4.94	0.21	0.28	0.28
5	Lime stone	2224	2.15	2.30	2.24	0.21	0.22	0.14
6	Dolomite	882	1.45	1.15	1.27	0.33	0.27	0.14
7	Fire clay	177	0.04	0.05	0.06	0.04	0.05	0.03
8	China clay	314	0.01	0.01	0.01	0.01	0.01	1.64
9	Nickel ore	175	-	-	-	-	-	-
10	Quartz, quartzite and silica	93	0.06	0.13	0.14	0.40	0.14	0.15
11	Mineral sands	86	0.21	0.15	0.23	0.26	0.17	0.28
12	Graphite	4.6	0.04	0.05	0.03	2.00	2.50	1.10
13	Manganese ores	116	0.54	0.63	0.70	1.08	1.26	0.59
14	Others	10.4	-	-	0.69	-	-	-

Source : Directorate of Mines, Orissa, Bhubaneswar.  
Directorate of Geology, Orissa, Bhubaneswar.

10.13 Orissa has a total reserve of 4177 million tonne of high grade iron ore which is 33.91% of the country's deposit. The State Government have been making concerted efforts to attract investment in steel based and other industries in order to make better use of the mineral wealth of the State. The first phase of the 2<sup>nd</sup> Steel Plant in the State, namely Neelachal Ispat Nigam Ltd. (NINL) has been commissioned at the Duburi Industrial Complex in the district of Jajpur. The Neelachal Ispat Nigam Ltd. (NINL) is promoted by MMTC and IPICOL in joint sector to set up a 1.1 MTPA capacity steel project with a project cost of Rs.1524 crore. The first phase of the Project has been commissioned and it has already started production of pig iron. Besides, Tata Iron and Steel Company is interested to set up

port based steel plant of 2.5 MTPA capacity at Gopalpur in Ganjam district. The company has already signed MOU with the State Government and an area of 3,734 acres has been handed over to the company. Implementation of the project is being delayed due to delay in completion of infrastructural amenities like development of port, railways and water supply.

10.14 The Sinter Plant of NINL has been commissioned during March, 2004 which will make production of Pig iron more profitable. The associated project of Konark Met Coke Ltd. (KMCL) set up at Durburi Industrial Complex made steady progress for production of coke which will make it one of the unique project of its kind in the country at a time when country is facing acute shortage of coke. State Government is desirous of utilizing natural resources of the State for rapid industrialization. The Government has been making determined efforts to establish new mineral based industries in different locations of the State. As a result, the following eight companies have signed MOUs with Government of Orissa for establishment of Steel Plants.

1. M/s. Bhusan Group of Companies
2. M/s. SCAW Industries (P) Ltd.,
3. M/s. Neepaz Metaliks (P) Ltd.,
4. M/s. Aarti Steels Ltd.,
5. M/s. Deo Mines and Minerals (P) Ltd.,
6. M/s. VISA Industries Ltd.,
7. M/s. SMC Power Generation Ltd.,
8. M/s. Shyam DRI Power Ltd.,

10.15 Orissa is rich in bauxite deposits with a reserve of 1,530 million tonne which is 49.73% of the country's deposit. The State Government have decided, in principle, to lease the bauxite mines to the prospective entrepreneurs through Orissa Mining Corporation with the condition that they will set up Alumina / Aluminium industries in the State. The OMC has entered into an agreement with M/s Utkal Alumina Ltd. to set up an Alumina Project in Rayagada district.

10.16 The State Government have formulated the "Gemstone policy of 1998" for promoting exploration and exploitation of gemstone resources in a scientific and systematic manner. The policy, inter alia, envisages steps for prevention of illegal trading and theft of gemstones, opening of the gemstone bearing areas to private sector exploitation and introduction of a scheme of issuing trading licenses to parties dealing with gemstone resources. Out of 28 gemstone bearing tracts identified in the State, 18 tracts have been developed so far and opened for re-grant of mining leases. Besides, few more gem bearing

areas have been located in parts of Nuapada, Kalahandi and Bolangir districts by the Directorate of Geology. There exists a good prospect for export of gems and jewelry from Orissa.

10.17 Consequent upon the discovery of the probable host rock and mineral for primary diamond in Nuapada district and recovery of few pieces of diamond, geological schemes have been drawn up for locating more such sources in the district. A technical team with required infrastructural support has been deployed in the field.

### ***EMPLOYMENT IN MINING AND QUARRYING SECTOR***

10.18 According to the 1991 Census, the number of persons engaged in mining and quarrying activities in Orissa was 1,01,247 as against 71,842 in 1981 registering a growth of 41%. This includes persons directly or indirectly engaged in both major and minor mineral activities. The figures for 2001 Census have not yet been compiled. Table 10.9 shows that the direct employment in major mineral activities has been showing a declining trend. The number of workers engaged directly in major mineral activities has declined from 53,209 in 1999-2000 to 43,743 during 2003-04 showing a decrease of 17.79% over the period. The decrease in employment is attributed in part to induction of higher technology and automation in mineral exploitation.

***Table 10.9***

***Year wise Number of Workers Directly Employed in Major Mineral Activities***

Sl. No.	Mineral Ore/ District	1999-00	2000-01	2001-02	2002-03	2003-04(P)
1	2	3	4	5	6	7
1.	Bauxite (Koraput, Sundargarh)	758	603	458	724	792
2.	Chromite (Dhenkanal, Jajpur, Keonjhar)	6779	6743	5624	4786	4424
3.	Coal, (Angul, Jharsuguda, Sundargarh)	19739	19583	17069	17657	17318
4.	Dolomite and lime stone (Baragarh, Bolangir, Nuapada, Koraput, Sundargarh)	5616	4868	3302	3245	3516
5.	Iron ore (Jajpur, Keonjhar, Mayurbhanj, Sundargarh)	12583	13255	11983	10523	11418

6.	Manganese ore (Keonjhar, Sundargarh, Rayagada)	4000	4081	3437	3660	3892
7.	Others	3734	3804	3262	3572	2383
<b>Total</b>		<b>53209</b>	<b>52937</b>	<b>45135</b>	<b>44167</b>	<b>43743</b>

*P : Provisional*

*Source : Directorate of Mines, Orissa, Bhubaneswar.*

### **MINING LEASES**

10.19 The total number of mining leases in the State as on 31.03.2004 was 607 covering an area of 1,01,947 hectares. Out of these, 339 leases covering an area of 73,910 hectares were in operation. Out of the total of 607 leases granted, 37 leases covering an area of 18,426 hectares were held by the Orissa Mining Corporation Ltd. out of which 18 leases were in operation covering an area of 12,096 hectares. During the year 2003-04, 8 nos. of mining leases and 22 nos. of prospecting licenses for major minerals covering 438.266 hectares and 811.500 hectares respectively. Besides, 4 nos. of quarry leases for decorative stones over a total area of 23.693 hectares have also been granted by state Government.

10.20 Table 10.10 presents data relating to the total quantity and value of different minerals / ores produced and value of exports by the Orissa Mining Corporation Ltd. during 2003-04.

**Table 10.10**

**Quantity and Value of Minerals Produced by OMC Ltd. during 2003-04**

Sl. No.	Ore / mineral	Quantity produced (thousand tonne)	Value (Rs. in lakh)	Despatched for export (thousand tonne)	Value of export (Rs. in lakh)	Average daily employment of labour
1	2	3	4	5	6	7
1	Chromite	756.40	10805.46	163.70	5192.01	1459
2	Iron ore	2392.29	20098.18	449.04	7016.68	841
3	Chrome concentrate	184.47	5162.07	185.25	3808.42	7
4	Manganese ore	88.01	1362.13	-	-	290
<b>Total</b>		<b>3421.17</b>	<b>37427.84</b>	<b>797.99</b>	<b>16017.11</b>	<b>2597</b>

*Source : Directorate of Mines, Orissa, Bhubaneswar.*

10.21 The liberalization policy of Government of India in Mining sector, has opened the doors for foreign investors in Orissa. Reputed foreign firms like the Global mining giants Rio Tinto and Empire Gold Mines N.L. of Australia have entered into joint ventures and agreements with O.M.C. This will also lead to the development of infrastructure in the State and open new vistas for the Corporation in the international arena.

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