CHAPTER III

RAW MATERIALS

Iron Ore

Reserves

As per the Survey conducted by the Indian Bureau of Mines (IBM) in April, 2000, India had 9919 million tonnes of recoverable reserves of haematite and 3546 million tonnes of magnetite. Zone A comprising of Bihar, Jharkhand and Orissa is the largest haematite ore bearing zone in the country, consisting mainly of medium grade and low grade ore (iron content 65% and below). Chhattisgarh has the largest quantity of high grade ore reserve (iron content greater than 65%) in the country. Karnataka has the highest reserves of magnetite ore followed by Andhra Pradesh and Goa.

The details of recoverable reserves of haematite and magnetite are as under :

Recoverable Reserve of Haematite as on 1.4. 2000

(Unit : in million tonnes)

S. No.	Zone/State	High grade ore (Fe+65%)	Medium grade ore(Fe 62-65%)	Low Grade ore (Fe below 62%)	Un-classi-fied	Other/ Not known	Blue dust Black iron	Total
1.	Zone A							
	Bihar	--	--	0.03	--	--	--	0.03
	Jharkhand	44.04	1794.06	873.09	139.25	1.74	10.57	2859.27
	Orissa	547.64	1857.33	507.54	280.83	10.54	0.03	3203.91
2.	Zone B							
	Chhattisgarh	461.24	562.06	463.17	388.07	--	28.52	1903.06
	Madhya Pradesh	--	6.23	65.20	14.93	14.16	15.27	115.79
	Maharashra	7.43	123.65	43.19	33.45	12.17	--	219.89
3.	Zone C							
	Karnataka	214.86	583.01	78.59	87.76	1.58	0.5	966.30
4.	Zone D							
	Goa region	0.02	132.75	392.38	33.22	12.97	9.52	580.86
5.	Zone E							
	Andhra Pradesh	23.04	3.99	28.20	2.66	0.38	--	58.27
	Rajasthan	--	0.26	9.60	1.64	0.15	--	11.65
	Grand Total	**1298.27**	**5023.34**	**2460.99**	**981.81**	**41.41**	**113.21**	**9919.03**

Recoverable Reserve of Magnetite as on 1.4.2000

(Unit : In million tonnes)

S. No.	State	Metallurgical grade	Coal washery grade	Foun-dry	Un-classified	Others / not known	Total
1.	Andhra Pradesh	37.87	--	--	380.00	--	417.87
2.	Assam	2.54	--	--	--	--	2.54
3.	Goa	98.33	--	--	64.69	3.28	166.30
4.	Jharkhand	--	5.09	--	0.11	0.06	5.26
5.	Karnataka	1265.32	--	--	1615.76	5.40	2886.48
6.	Kerala	36.09	--	--	--	--	36.09
7.	Maharashtra	0.19	--	--	--	--	0.19
8.	Rajasthan	--	--	0.30	0.08	--	0.38
9.	Tamil Nadu	1.08	--	--	--	--	1.08
	Total	**1441.40**	**5.09**	**0.30**	**2060.64**	**8.74**	**3516.19**

Production and Despatches :

Production of iron ore (including concentrates) during the year 2002-2003 is estimated at 86.4 million tonnes as against 83.4 million tonnes in the previous year. State-wise production figures indicate that Karnataka would be the leading iron ore producing state accounting for 21.95 million tonnes (25.4%) of the total production during 2002-2003 followed by Orissa with 19.79 million tonnes (22.9%). Chhattisgarh with 17.28 million tonnes (20%), Jharkhand with 13.90 million tonnes (16.1%) and Goa with 12.87 million tonnes (14.9%). Remaining production of about 0.61 million tonnes would be from Andhra Pradesh, Madhya Pradesh, Maharashtra and Rajasthan. Despatches of iron ore (including concentrates) for 2002-03 are estimated at 84.7 million tonnes. The despatches of iron ore for internal consumption and exporets would be 53.3 million tonnes and 31.4 million tonnes respectively. Details of production and despatches are given below:

(Quantity : Million Tonnes) (Value : Rupees in crores)

Year/ Period	Production		Despatches		
	Quantity	Value	For internal consumption	For Exports	Total
1996-97	68.2	1479.56	38.2	29.5	67.7
1997-98	75.7	1819.70	40.5	33.7	74.2
1998-99	72.2	1855.95	38.9	30.5	69.4
1999-2000	77.6	1973.75	41.0	30.5	71.5
2000-01	80.7	2126.74	46.4	33.5	79.9
2001-02(P)	83.4	2168.20	48.9	31.5	80.4
2002-03(E)	86.4	2284.02	53.3	31.4	84.7

P=Provisional
E=Estimate (includes the recorded figures upto July 2002 and estimates for August 2002 to March 2003).

Chromite ore

Reserves

As per the National Mineral Inventory as on 1.4.2000, the total recoverable reserves of chromite ore are estimated at over 97 million tonnes of which 97 % reserves are confined to Orissa state.

Production

Production of chromite in 2002-2003 (upto Dec.2002) is estimated at 19.11 lakh tonnes as against 18.10 lakh tonnes in 2001-2002. Orissa continues to be the major producing state accounting for 18.95 lakh tonnes (99%) of the total production (upto Dec.2002).

Despatches

Estimated despatches of chromite during 2002-2003 upto December, 2002 are 14.61 lakh tonnes of which 7.57 lakh tonnes (52%) would be for internal consumption and 7.04 lakh tonnes (48%) for export.

Details of production and despatches of chromite during the year 1997-98 to 2002-2003 are given below :

(in thousand tonnes)

Year/Period	Production		Despatches		
	Quantity	Value (Rs.crores)	Total	For Internal consumption	For Exports
1997-98	1,515	304.55	1,343	936	407
1998-99	1,418	282.34	1,289	904	385
1999-2000	1.738	346.72	1,570	869	701
2000-2001	1,971	364.97	1,729	1,062	667
2001-2002*	1,810	342.29	1,792	981	811
2002-2003** Upto Dec.2002	1,911	314.20	1,461	757	704

- Estimated (Includes the recorded figures upto October, 2002 and estimates for November, 2002 and December, 2002)

Source : Indian Bureau of Mines, Nagpur.

Exports

Keeping in view the limited reserves of chromite ore in the country, only certain grades of chromite Ore are allowed for export. The ceilings fixed under Export Policy for 2002-03 in respect of chromite ore are as follows:

No.	Item	Ceilings (in lakh tonnes)
i)	Low silica friable/fine chromite ore with chromium oxide in the range 52-54% and Silica exceeding 4%	0.40] Within the overall ceiling of 4 lakh tonnes.
ii)	Low Silica friable/fine chromite ore with chromium oxide not exceeding 52% and silica exceeding 4% **And** Chromite lumps containing chromium oxide not exceeding 40%	3.60] Within the overall ceiling of 4 lakh tonnes.
iii)	Beneficiated chromite concentrates (average feed grade to be less than **42%** Cr203).	No ceiling

Ferro Alloys

The Indian Ferro Alloy Industry is more than four decades old, and produces bulk and noble ferro alloys. Although this Industry is not as old as the Steel Industry, its capacity has increased substantially.

India is bestowed with adequate resources of all basic raw materials required for production of manganese, silicon and chrome alloys. Most of the ferro alloy units have been set up in the States of Andhra pradesh, Karnataka, Madhya Pradesh, Maharashtra and West Bengal due to availability and/or proximity of the raw materials.

Recently, the Industry has further spread to the North Eastern region of India – in Meghalaya a number of units producing ferro silicon and ferro silico manganese have come up.

Capacity and Performance of the Industry

Ferro alloys industry is a power intensive industry. The total load of the Industry has grown almost 8 to 9 times from 130 MVA in the mid sixties to over 1000 MVA. The installed capacity of the Industry is now 1.7 million tonnes of bulk and noble ferro alloys. The capacity of manganese alloys is around 8,14,000 tonnes; ferro silicon 2,04,000 tonnes and ferro chrome/charge chrome

about 6,25,000 tonnes and noble ferro alloys viz., ferro molybdenum, ferro vanadium, ferro tungsten, silico magnesium, ferro titanium, ferro phosphorous, etc. around 50,000 tonnes. The capacity utilization during 2001-02 was around 50%. The production has gone down by 8.28% as compared to the previous year, due to high power tariff, cut-throat competition in international market and stagnation in the steel demand and production in the country.

The ferro alloy units have incorporated the latest technology in order to use non- metallurgical grade ores both lumps as well as fines, after necessary beneficiation and agglomeration. The Units have also incorporated effective pollution control measures, in the form of gas cleaning, deoxidizing and waste heat recovery.

Production of major bulk and noble ferro alloys during the last five years is given hereunder:

Year	Quantity(in lakh tonnes)
1998-99	7.24
1999-2000	7.29
2000-2001	9.02
2001-2002	8.28
2002-2003(upto 31.12.2002 (estimated)	6.45

- **Source: Indian Ferro Alloys Producers' Association, Mumbai**

Export of Ferro Alloys

Exports which were around 15% of the production when the liberalized policy was introduced in 1991-92, are now around 35% of the total production. In terms of value, exports which were about Rs.250 crores had crossed Rs.500 crores in 1997-98. However, there was a slow down in the exports during 1999-2000; dropping to Rs.392.50 crores due to global recession in the steel industry. The export of ferro-alloys touched an all time high of Rs.554.60 crores during 2000-2001. However, it dropped to Rs. 273.10 crores in 2001-2002 as it was unable to compete in the international market due to high power tariff.

The Industry has already established itself as a regular exporter of high carbon ferro chrome/charge chrome and silico manganese. It has potential to export manganese alloys, ferro silicon, ferro vanadium, silico magnesium, etc. The reputed exporters have obtained 9002 certification. Details of export of ferro alloys for last five years are given hereunder:

Year	Quantity(in lakh tonnes)	Value(Rs. in crores)
1997-98	2.59	504.50

1998-99	2.48	519.00
1999-2000	2.06	392.50
2000-2001	2.70	554.60
2001-2002	1.52	273.10
2002-2003(upto 31.12.2002 estimated)	1.00	180.00

*** Source: Indian Ferro Alloys Producers' Association, Mumbai**

Manganese Ore

Reserves

As per the National Mineral Inventory as on 1.4.2000, the recoverable reserves of manganese ore are placed at 191 million tonnes. The major reserves in the country are of blast furnace grade. The reserves of ferro-manganese grade are very limited to about 11% of the total reserves.

Production

Production of manganese ore during the year 2002-2003 (upto 31.12.02) is estimated at 1.17 million tonnes at par with that of the previous year. Orissa, Maharashtra, Madhya Pradesh and Karnataka are the principal producing states together accounting for 95% of the total production of manganese ore during the period April to December 2002-2003.

Despatches

Details of production and despatches of manganese ore during the year 1997-98 to 2002-2003 are given below :-

Year/Period	Production		Despatches		
	Quantity ('000 tonnes)	Value (Rs.Crores)	For Internal ('000 tonnes)	For Exports Consumption ('000 tonnes)	Total ('000 tonnes)
1997-98	1,640	117.69	1,677	1,457	220
1998-99	1,538	173.83	1,461	1,259	202
1999-2000	1.586	193.09	1,621	1,263	358
2000-2001	1,595	197.75	1,676	1,455	221
2001-2002 (Provisional)	1,553	208.53	1,649	1,443	206
2002-2003 (uptoDec.02) (Estimated)	1,165	162.42	1,237	1,098	139

- **Estimated (includes the recorded figures up to October, 2002 and estimates for November and December, 2002**

Exports

Export Policy in respect of manganese ore is decided keeping in view the need for conserving high grade ores. Alongwith this, effort is also made to replace the export of ores with export of value added items.

For the year 2002-03, the ceilings fixed for export of manganese ore are as follows:-

No.	Item	Ceilings (in lakh tonnes)
i)	Medium grade manganese ore/blended ore containing 46%-49% manganese only with not less than 0.24% Phos.	0.25] Within overall ceiling of 1.25] 1.50 lakh tonnes
ii)	Medium grade manganese Ore/blended ore containing 38% to 46% manganese and more than 0.15% Phos. **OR** Medium grade manganese ore/blended ore containing 38% to 46% manganese and more than 0.10% Phos	]
iii)	Low grade manganese ore/blended ore coantaining less than 38% manganese	4.00
iv)	Manganese ore fines below 12 mm in size containing less than 44% manganese	1.50

Consumption of Coking Coal

During 2001-02, the consumption of coking coal in SAIL steel plants (including IISCO), RINL and TISCO was as under :

(in million tonnes)

	SAIL	RINL	TISCO
Indigenous sources	6.23	0.325	2.03
Imports	6.29	2.667	1.62
Total	12.52	2.992	3.65

Consumption of non-coking Coal

During the year 2001-02, SAIL Steel Plants (including IISCO) consumed 4.47 million tonnes of non-coking coal while. During 2001-02, RINL consumed 1.377 million tonnes of non-coking coal. and TISCO 0.87 million tonnes.