

47 Iron Ore

Iron & steel is the crux for industrial development in a country. The vitality of the iron & steel industry largely influences the economic status of a country. Iron ore being the essential raw-material for Iron & Steel Industry, its mining arguably is the cynosure of all mining activities undertaken by any country. With the total resources of over 28.5 billion tonnes of hematite (Fe_2O_3) and magnetite (Fe_3O_4), India is one of the leading producers as well as exporters of iron ore in the world.

RESOURCES

Hematite and magnetite are the most important iron ores in India. About 59% hematite ore deposits are found in the Eastern Sector. About 92% magnetite ore deposits occur in Southern Sector, especially in Karnataka. Of these, hematite is considered to be superior because of its high grade. Indian deposits of hematite belong to the Precambrian Iron Ore Series and the ore is within banded iron ore formations occurring as massive, laminated, friable and also in powdery form.

As per UNFC system, the total provisional resources of hematite as on 1.4.2010 are estimated at 17,882 million tonnes of which 8,093 million tonnes (45%) are under 'reserve' category and the balance 9,789 million tonnes (55%) are under 'remaining resources' category. By grades, lumps constitute about 56% followed by fines (21%), lumps with fines (13%) and the remaining 10% are black iron ore, others and not known grades. Major resources of hematite are located in Odisha - 5,930 million tonnes (33%), Jharkhand - 4,597 million tonnes (26%), Chhattisgarh - 3,292 million tonnes (18%), Karnataka - 2,159 million tonnes (12%) and Goa - 927 million tonnes (5%). The balance resources of hematite are spread in Andhra Pradesh, Assam, Bihar, Maharashtra, Madhya Pradesh, Meghalaya, Rajasthan and Uttar Pradesh (Table - 1).

Magnetite is another principal iron ore that also occurs in the form of oxide, either in igneous or metamorphosed banded magnetite-silica formation, possibly of sedimentary origin. As per UNFC system, the total resources of magnetite as on 1-4-2010 provisional are estimated at 10,644 million tonnes of which 'reserves' constitute a mere 22 million tonnes while 10,622 million tonnes are placed under 'remaining resources'. Classification on the basis of grades show 21% resources of metallurgical grade while 77% resources belong to unclassified, not-known and other grades. The resources of coal washery and foundry grades constitute meagre proportions. India's 97% magnetite resources are located in its four states, namely, Karnataka - 7,812 million tonnes (73%) followed by Andhra Pradesh - 1,464 million tonnes (14%), Rajasthan - 527 million tonnes and Tamil Nadu - 507 million tonnes (5% each). Assam, Bihar, Goa, Jharkhand, Kerala, Maharashtra, Meghalaya and Nagaland together account for the remaining 3% resources (Table-2).

EXPLORATION & DEVELOPMENT

In 2009-10, GSI, State Directorates of Chhattisgarh, Karnataka, Meghalaya and Odisha along with NMDC, SAIL, Mysore Minerals Ltd, OMC, M/s Chowgule & Co. Pvt. Ltd and M/s V.M. Salgaocar & Bro. Pvt. Ltd conducted exploration for iron ore. Details of exploration activities carried out by various agencies in 2009-10 are furnished in Table-3.

PRODUCTION, STOCKS & PRICES

The production of iron ore constituting lumps, fines and concentrates was at 218.6 million tonnes in the year 2009-10, and showed an increase of about 2.7% from that of the preceding year which could be attributed to better utilisation of resources and increased demand.

IRON ORE

There were 319 reporting mines in 2009-10 as against 328 in the previous year. Among them, 34 mines were in the public sector and 285 in private sector. Besides, production of iron ore was reported as an associated mineral by 16 mines in the current year as compared to 14 in the previous year. The contribution of public sector to the total production was about 27.1% as against 30.4% in the preceding year. The remaining 72.9% of the total production in 2009-10 was from private sector. Among 34 public sector mines, 15 mines (5 in Chhattisgarh, 5 in Odisha, 3 in Jharkhand and 2 in Karnataka) each producing more than one million tonnes annually accounted for 93.8% of the total output in public sector and 25.4% of the total production in the country during 2009-10. Out of 285 mines in private sector, 41 mines (18 in Odisha, 9 in Goa, 8 in Karnataka, 5 in Jharkhand and 1 in Andhra Pradesh) each producing more than one million tonnes annually accounted for about 63.3% of the total output of private sector and about 46.2% of the national production. Thus, 56 mines, each producing more than one million tonnes of iron ore annually, contributed about 71.6% of the total output in 2009-10.

Out of 24 captive mines in the country, 14 were in the public sector and the remaining 10 in private sector. The production of captive mines in the public sector was 24.4 million tonnes or 41.1% of the sectoral output in 2009-10. On the other hand, production of captive mines in private sector was only 18 million tonnes or 11.3% of the output in private sector.

Gradewise analysis of the current year's output reveals that, out of total output of 218.6 million tonnes, iron ore lumps constituted 91.7 million tonnes or about 42%, fines 126.2 million tonnes or about 57.7% and concentrates 0.8 million tonnes or about 0.3%. Of the total output of iron ore lumps, 33.3 million tonnes or 36.3% was of grade 65% Fe and above, 37.9 million tonnes or 41.1% of grade 62% to below 65% Fe, 8.5 million tonnes or 9.2% was of grade 60% to below 62% Fe and the rest 12 million tonnes or about 13.1% of the production was of grade below 60% Fe. In the case of iron ore fines,

21.1 million tonnes or 16.8% of the production was of grade 65% Fe and above, 61.6 million tonnes or 48.8% of grade 62% to below 65% Fe and balance 43.5 million tonnes or about 34.4% of grade below 62% Fe. The grade of iron ore concentrates produced in Goa was above 64.5% Fe. The average Fe content of iron ore was about 63.2% in the year 2009-10 as compared to 63.4% in the year 2008-09.

Among the states, Odisha recorded the highest production of 79.3 million tonnes or about 36.2% of the domestic production in 2009-10. Karnataka attained the second place with production of 43 million tonnes or 19.7% of the total production followed by Goa with 39.3 million tonnes or 18%, Chhattisgarh 26.5 million tonnes or about 12.1% , Jharkhand 23 million tonnes or 10.5% and Andhra Pradesh 6.2 million tonnes or 2.8%. Nominal production was also reported from Madhya Pradesh, Maharashtra and Rajasthan (Tables - 4 to 7).

In 2009-10, a total of 193.7 million tonnes of iron ore was despatched for exports and internal consumption as against 192.4 million tonnes in the previous year. Out of this, 56.7 million tonnes of iron ore was despatched for exports and 137 million tonnes for internal consumption. The corresponding figures for exports and internal consumption in the preceding year were 64.4 million tonnes and 128 million tonnes, respectively. Data on despatches for internal consumption given above includes 5.7 million tonnes and 9.4 million tonnes of despatches during for 2009-10 and 2008-09, respectively, from the state of Goa, which is actually meant for exports.

The mine-head stocks of iron ore at the end of the year under review were 90.2 million tonnes as compared to 74.6 million tonnes in the beginning of the year. The stocks relate to iron ore lumps, fines and concentrates in all the states (Tables 8A & 8B).

The average daily employment of labour strength was 43,326 during 2009-10 as against 42,702 in the preceding year. The prices of iron ore are furnished in the General Review on 'Prices'.

IRON ORE

Table – 1 : Reserves/Resources of Iron Ore (Hematite) as on 1.4.2010 (P)
(By Grades/States)

(In '000 tonne)

Grade/State	Reserves				Remaining resources				Total resources (A+B)				
	Proved		Probable		Measured		Indicated			Reconnaissance STD334			
	STD111	STD121	STD122	STD122	STD331	STD332	STD333						
All India	5982042	1173324	938180	8093546	515353	756190	494738	540188	1197539	3942673	2341870	9788551	17882097
By Grades													
Lump, High-grade	704874	89475	229589	1023938	85053	67668	11746	53586	32222	188840	35687	474802	1498740
Lump, Medium-grade	3411208	643575	272908	4327691	90878	203315	135930	156886	560175	903906	42533	2093623	6421314
Lump, Low- grade	154561	29684	61602	245847	84583	36168	95031	11653	91346	823326	238032	1380139	1625986
Lump, Unclassified	29097	114	40022	69233	54870	183	7882	52768	32934	151983	22800	323420	392653
Fines, High-grade	167700	4294	56498	228492	8215	6132	5675	54480	8451	46459	880	130292	358784
Fines, Medium-grade	421188	233772	56194	711154	38963	155282	54799	173318	279600	675621	18222	1395805	2106959
Fines, Low-grade	330476	48717	49103	428296	89848	57270	85045	9794	76746	416943	28977	764623	1192919
Fines, Unclassified	735	-	320	1055	-	-	-	8452	12908	118738	15200	155298	156353
Lumps & Fines, High-grade	256525	61689	26026	344240	24990	419	59151	8378	7981	6698	112375	219992	564232
Lumps & Fines, Medium-grade	207919	38185	59596	305700	3320	20531	15525	9495	19461	48741	238214	355287	660987
Lumps & Fines, Low-grade	183839	20463	31219	235521	29694	13310	11174	745	73912	274859	100498	504192	739713
Lumps & Fines, Unclassified	97236	10	51198	148444	2103	175147	10045	633	725	31256	3602	223511	371955
Black Iron Ore	3150	-	1370	1464	4936	2716	-	1059	8294	-	-	17005	18469
Others	11888	2501	2536	16925	6	13591	17	-	-	25154	-	38768	55693
Unclassified	-	-	-	-	1314	389	-	-	-	389	-	2092	2092
Not- known	1648	846	-	2494	51	1850	-	-	18	161188	1484850	1647957	1650451
By States													
Andhra Pradesh	60038	58011	34167	152216	551	20988	32475	377	4624	169955	291	229261	381477
Assam	-	-	-	-	-	-	-	-	8600	4000	-	12600	12600
Bihar	-	-	-	-	-	-	-	-	-	55	-	55	55
Chhattisgarh	636460	-	263650	900110	114382	5080	15610	107625	527563	872739	748715	2391714	3291824
Goa	367378	44907	57559	469844	88723	63145	117393	7539	10050	141984	28493	457327	927171
Jharkhand	1840594	391052	72496	2304142	89372	14339	113334	45282	199455	594716	1235981	2292479	4596621
Karnataka	602685	95458	178723	876866	73194	171202	59231	245454	42843	501669	188218	1281811	2158677
Madhya Pradesh	40534	7099	9181	56814	9978	587	10170	4710	4014	145162	10	174631	231445
Maharashtra	6937	6460	17	13414	7544	6093	7659	79793	71806	64714	32185	269794	283208
Meghalaya	-	-	-	-	-	-	-	-	-	225	-	225	225
Odisha	2422247	569186	321568	3313001	128440	471517	138365	49408	317074	1404450	107978	2617232	5930233
Rajasthan	5169	1152	819	7140	3168	3239	500	-	11510	5004	-	23421	30561
Uttar Pradesh	-	-	-	-	-	-	-	-	-	38000	-	38000	38000

Figures Rounded Off.

IRON ORE

Table – 2 : Reserves/Resources of Iron Ore (Magnetite) as on 1.4.2010 (P)
(By Grades/Stages)

Grade/State	Reserves				Remaining resources							Total resources (A+B)	
	Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334		Total (B)
		STD121	STD122			STD221	STD222						
All India : Total	15973	3672	2111	21756	189478	1714	50816	1513168	1984566	6313583	568980	10622305	10644061
By Grades :													
Metallurgical	2149	3047	369	5565	163205	102	18435	690596	342792	966726	255	2182111	2187676
Coal washery	-	346	510	856	-	518	1981	411	318	4491	-	7719	8575
Foundry	330	125	-	455	-	-	-	-	-	303	-	303	758
Others	2074	139	-	2213	62	-	-	-	-	231	-	293	2506
Unclassified	11049	14	978	12041	26211	1094	30400	822161	1641456	5061583	568677	8151582	8163623
Not-known	372	-	254	626	-	-	-	-	-	280249	48	280297	280923
By States													
Andhra Pradesh	-	-	-	-	43034	-	-	13800	1266666	140027	14	1463541	1463541
Assam	-	-	-	-	-	-	-	-	-	15380	-	15380	15380
Bihar	-	-	-	-	-	-	-	-	-	2659	-	2659	2659
Goa	12489	3186	-	15675	26211	1094	30400	-	-	147296	1997	206998	222673
Jharkhand	-	361	551	912	-	518	1981	411	3948	2724	48	9630	10542
Karnataka	-	-	-	-	120022	-	18375	1498957	479372	5345018	340000	7801744	7801744
Kerala	-	-	-	-	-	-	-	-	59912	23523	-	83435	83435
Maharashtra	559	-	315	874	211	-	60	-	-	215	-	486	1360
Meghalaya	-	-	-	-	-	-	-	-	-	3380	-	3380	3380
Nagaland	-	-	-	-	-	-	-	-	5280	-	-	5280	5280
Odisha	-	-	54	54	-	102	-	-	-	43	-	145	199
Rajasthan	2924	125	1191	4240	-	-	-	-	-	522590	-	522590	526830
Tamil Nadu	-	-	-	-	-	-	-	-	169388	110728	226921	507037	507037

Figures rounded off.

IRON ORE

Table – 3 : Details of Exploration Activities for Iron ore 2009-10

Agency/ State/ District	Location/ Area/ Block	Mapping		Drilling		Sampling (No.)	Remark Reserves/ Resources Estimated
		Scale	Area (sq km)	No. of Boreholes	Meterage		
GSI Andhra Pradesh Khammam	Bayyaram, Nilvancha, Sitanager & Surrounding area	1:12,500	60	–	–	485	Based on sampling and mapping five iron ore bands have been delineated and potential blocks were identified for systematic assessment of iron ore mineralization. Analytical results are awaited. Iron ore occurs in two geological domains, one associated with BMR & others with quartzite. Iron ore occurs as 10m-40m wide magne-tite-hematite quartzite bands.
Chhattisgarh Kanker	Parwi area,	–	–	–	–	–	Four massive iron ore bands (Band-I to IV) have been delineated with strike length of 300 m, 150 m, 200 m and 85 m respectively. The true outcrop width ranges from 5 m to 18 m. Analytical results of channel samples of Band-III have shown max. value of 67% Fe. The drilling operation could not be initiated during 2009-10 for want of requisite clearances.
-do-	Aridongri Area	–	–	–	–	–	During mapping three iron ore bands of lenticular nature have been delineated which have a strike length of 2.373 km. strike length of northernmost band is about 1.383 km with width ranging from 3-15 m. The central band has a strike length of about 130 m with width of 15 m the southern most band has a strike length of about 880 m with width of 25 m.
Karnataka Bellary	Taranagar & Rajpura	1:12,500	–	–	–	–	Systematic bed rock and pit/ trench sampling have been carried out in two identified blocks (Block A & Block B) in the Taranagar area and potential BIF bands have been delineated. Analytical results are awaited.
Meghalaya East Garo Hills	Northern part of East Garo Hills	1:10,000	15	–	–	25	The BMQ bands were exposed as a discontinuous bands over a strike length of about 2 km with width ranging from 10-85 m. The depth persistence of iron ore bands seems to be limited. In many portions of the area the iron ore also occur as floats.
Odisha Keonjhar	Daitari & Sindurimundi Lease hold area of OMC Ltd	–	–	–	–	–	An interbanded sequence of soft laminated ferruginous shale & brown chert overlain by massive & hard laminated iron ore band has been delineated. The massive and laminated iron ore mostly consists of hematite with some goethite and is occasionally limonitised.

(Contd.)

IRON ORE

Table 4 (Contd.)

Agency/ State/ District	Location/ Area/ Block	Mapping		Drilling		Sampling (No.)	Remark Reserves/ Resources Estimated
		Scale	Area (sq km)	No. of Boreholes	Meterage		
Sundergarh	Ghoraburhani Sagasahi	—	—	9	—	—	About 4.61 million tonnes of indicated iron ore resources (332) with an average grade of 61.97% Fe at cut-off grade with 55% Fe has been estimated. Thus in Ghoraburhani blocks so far a total of 13.71 million tonnes of indicated iron ore resources (332) has been estimated.
GSI Rajasthan	Bagholi-Papra iron ore deposits of northern Rajasthan	—	—	—	—	14	Strong aeromagnetic signatures with peak value of 9770 & 9910 gammas are recorded which corroborate well the known iron ore occurrences. The borehole drilling is in progress and intersected iron of albitised calc-gnesis and minor dissemination of iron ore have been reported.
	Jahazpur belt	1:25,000 1:10,000	450 2	—	—	60	Several impersis iron ore bands with width varying from 5m to 20 m were demarcated. Significant development of boxwork structure and botryoida growth indicates secondary enrichment. The depth persistence of the band is presumably of limited extent. Presence of old working is noted.
DGM Chhattisgarh	Rawghat Kanker	1:50,000	415	32	—	26	About 5 million tonnes of iron area ore reserves of inferred category with an iron content of + 60% were estimated.
Karnataka	Haveri & Shimoga	Ambarkoppa, 1:50,000 Tumbinakatte & Veerapura	300	—	—	20	About 6.20 million tonnes of iron ore resources have been estimated.
Meghalaya	East Garo Hills	Aradanga & Atisabari	1:4,000	1.05	—	—	Reserves not estimated.
	West Garo Hills	Rambari & Mawdeh	1:4,000	2.50	—	—	Reserves not estimated.
Odisha	Keonjhar	West of Bonekela Baneikala Brahmanjhor	1:25,000 1:2,000	29 0.3	— —	— 72	Reserves not estimated. Reserves not estimated.
	Sundergarh	Kusumdihi, Roladihi & Bandhala	1:25,000	32	—	—	2.18 million tonnes of reconnaissance resources were estimated.
-do-	Randa, Dengichuan & Rajabasa	1:25,000	27	—	—	9	Reserves not estimated.

(Contd.)

IRON ORE

Table 4 (Contd.)

Agency/ State/ District	Location/ Area/ Block	Mapping		Drilling		Sampling (No.)	Remark Reserves/ Resources Estimated
		Scale	Area (sq km)	No. of Boreholes	Meterage		
NMDC Ltd. Chhattisgarh	Deposit 11 B, 14 & 11C Bailadila Iron ore Mine	-	-	23	1601	-	Exploratory drilling is under progress. Drill samples are being prepared for chemical analysis. Resources will be calculated after completion of drilling.
Karnataka Bellary	Donimalai iron ore mine	-	-	22	1005	444	Reserves yet to be estimated.
SAIL Chhattisgarh	Rajhana Mech Mine	1:2000	220.42 hect.	39	1679	1380	A total of about 35.45 million tonnes at cut off grade of with 45% Fe has been estimated.
SAIL Chhattisgarh	Dalhi Mech. Mine	1:2000	333.50 hect.	8	179	44	A total of about 28.37 million tonnes at cut-off grade of with 45% Fe has been estimated.
- do -	Jhran Dalhi Mech. Mine	1:2000	201.45 hect.	30	1168	1085	As on 1.4.2010 a total of about 6.82 million tonnes at cut-off grade of 45% Fe has been estimated out of which 7.05 million tonnes resources were estimated during the year.
-do-	Mahamaya	-	-	42	-	-	About 4.01 million tonnes iron ore resources were estimated. Out of which 7.05 million tonnes resources were estimated during the year.
-do-	Dalhi Mech. Mine	1:2000	333.50 hect.	8	179	44	A total of about 28.37 million tonnes at cut-off grade of with 45% Fe has been estimated.
	Dalli manual	1:2000	100.00 hect.	4	34.70	17	As on 1.4.2010 a total of about 3.38 million tonnes at cut-off grade of 45% Fe has been estimated..
Jharkhand Singhbhum (West)	Kiriburu	1:2000	276.00 hect.	22	1570	1570	As on 1.4.2010 about 49 million tonnes of iron ore resources were estimated. Out of which 20.0 million tonnes resources.
-do-	Meghahatuburu	-	-	44	200	1250	As on 1.4.2010 a total of 55.53 resources were estimated.
-do-	Dhobil	-	-	1 *	17	-	Estimation under progress.
-do-	Sukri	-	-	4 *	341	-	Estimation under progress.
-do-	Gua	-	-	7	14	-	Estimation under progress.
-do-	Jhillingburu-I Gua iron	-	-	7	285	-	Resources yet to be estimated.

(Contd.)

IRON ORE

Table 4 (Concl.)

Agency/ State/ District	Location/ Area/ Block	Mapping		Drilling		Sampling (No.)	Remark Reserves/ Resources Estimated
		Scale	Area (sq km)	No. of Boreholes	Meterage		
Odisha							
Keonjhar	Bolani iron ore mine	1:2000	1321	7	375	375	Resources yet to be estimated.
Chowgule and Co. Pvt. Ltd							
Goa							
North Goa	Sirigao	-	-	-	-	-	As on 1.1.2010, about 14.72 million tonnes iron ore resources were estimated.
-do-	Pale	-	-	-	-	-	As on 1.4.2010, about 2.70 million tonnes iron ore resources were estimated.
-do-	Onda	-	-	-	-	-	As on 1.1.2010, about 4.17 million tonnes iron ore resources were estimated.
-do-	Vegurien	-	-	-	-	-	As on 1.1.2010, about 0.17 million tonnes iron ore resources were estimated.
-do-	Gavanem	-	-	-	-	-	As on 1.1.2010, about 3.20 million tonnes iron ore resources were estimated.
Goa							
South Goa	Costi	-	-	-	-	-	As on 1.1.2010, about 7.63 million tonnes iron ore resources were estimated.
-do-	Tudou	-	-	-	-	-	As on 1.1.2010, about 24.69 million iron ore resources were estimated.
V.M. Salgaocar & Bro .Pvt. Ltd							
Goa							
North Goa	Velguem/ Surla Jhine	1:2000	105.88 hect.	20	1229	305	As on 1.4.10 about 11.04 million tonnes were estimated.
North and South Goa	Saneordem/ Malpona Mine	1;2000	-	-	-	-	As on 1.4.2010 about 1037 million tonnes were estimated.
South Goa	Sigao Mine	1:2000	44.95 hect.	22	1277	124	As on 1.4.2010 about 7.50 million iron ore resources were estimated.

IRON ORE

**Table – 4 : Principal Producers of Iron ore
2009-10**

Name & address of producer	Location of mine	
	State	District
National Mineral Development Corporation Ltd, 10-3-311/A, Khanij Bhavan, Masab Tank, Hyderabad –500 028, (Andhra Pradesh).	Karnataka Chhattisgarh	Bellary Dantewada
Steel Authority of India Ltd, Ispat Bhavan, Lodhi Road, New Delhi – 110 003.	Jharkhand Chhattisgarh Odisha	Singhbhum (West) Durg Sundergarh Keonjhar
Tata Steel Ltd, 24, Homy Mody Street, Fort, Mumbai – 400 002, (Maharashtra).	Jharkhand Odisha	Singhbhum (West) Keonjhar
Sesa Goa Ltd, Altinho, Panjim, Goa – 403 001.	Goa Karnataka	North Goa, South Goa Chitradurga
The Orissa Mining Corporation Ltd, P. B. No. 34, Bhubaneswar-751 001, (Odisha).	Odisha	Keonjhar Sundergarh
Essel Mining & Industries Ltd, 10, Camac Street, Kolkata-700 017, (West Bengal).	Odisha	Keonjhar Sundergarh
Sarda Mines Private Limited, Thakurani Iron Ore Mines (Block B) Post Box No. 85, P.O. Barbil-758 035, Keonjhar, (Odisha).	Odisha	Keonjhar
Rungta Mines Pvt. Ltd, 206, A.C.J Bose Road, Kolkata – 700 017, (West Bengal).	Jharkhand Odisha	Singhbhum (West) Keonjhar
Ramesh Prasad Sao, Near Gandhi Park, Chaibasa - 833 201, Singhbhum (West) (Jharkhand).	Odisha	Keonjhar

(Contd.)

Table 4 (Contd.)

Name & address of producer	Location of mine	
	State	District
Obulapuram Mining Co. (P) Ltd, Ennoble House, Raghavachari Road, Bellary- 583 101, Karnataka.	Andhra Pradesh	Anantapur
Rungta Sons (P) Ltd, Rungta House, Chaibasa-833 201, Singhbhum (West), (Jharkhand).	Odisha	Sundergarh
Kamaljeet Singh Ahluwalia, P. B. No. 3, Barbil-758 035, Keonjhar, (Odisha).	Odisha	Keonjhar
Chowgule & Co. Ltd, Chowgule House, Marmugao Harbor, Vasco-da-gama, Goa - 403 803.	Goa	North Goa
Cosme Costa & Sons Altino Mapusa, Goa.	Goa	North Goa
Jindal Steel & Power Ltd, P. B. No. 6, Delhi Road, Hissar-125 005, Haryana.	Odisha	Sundergarh
V. M. Salgaocar & Bro.Pvt.Ltd, Salgaocar House, P. B. No.14, Vasco-da-gama, Goa-403 803.	Goa	North Goa South Goa
Smt. Indrani Patnaik, Bonaikela, P.O. Joda-758 035, Keonjhar, (Odisha).	Odisha	Keonjhar
Bonai Industrial C. Ltd, P.O., Barbil-758 035, Keonjhar, (Odisha).	Odisha	Sundergarh
Mysore Minerals Ltd, 39, M.G. Road, Bengaluru – 560 001, (Karnataka).	Karnataka	Bellary

(Contd.)

IRON ORE

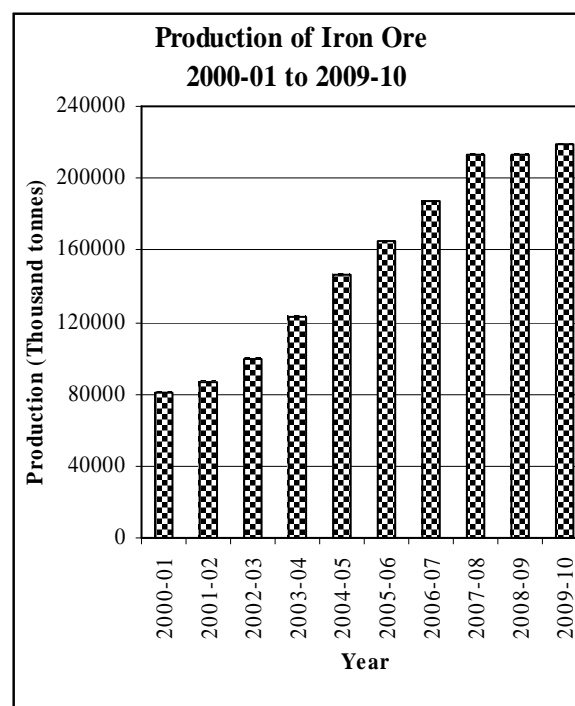
Table 4 (Contd.)

Name & address of producer	Location of mine	
	State	District
Aryan Mining & Trading Corpn.(P) Ltd, 61, Strand Street, Kolkata-700 006, (West Bengal).	Odisha	Sundergarh
Feegrade & Co. (P) Ltd, P.O. Barbil-758 035, Dist. Sundergarh, (Odisha).	Odisha	Sundergarh
Sesa Mining Corporation Ltd. Jeevan Vishwas, LIC Building, 2 EDC Complex, Panji-403 001, (Goa).	Goa	North Goa
Padam Kumar Jain, Chaibasa-833201, Singhbhum(West), (Jharkhand).	Jharkhand	Singhbhum (West)
Kaypee Enterprises, Post Box No.3, P. O. Barbil-758 035, Keonjhar, (Odisha).	Odisha	Keonjhar
Mineral Enterprises Ltd, Khanij Bhavan, No 49, 3 rd Floor, Race Course Road, Benguluru 560 001, (Karnataka).	Karnataka	Chitradurga
Veerabhadrapppa Sangappa & Co., No. 2/138, Bellary Road, Sandur-583 119, (Karnataka).	Karnataka	Bellary
Usha Martin Ltd, Mangal Kalash, 2A Shekshpear Sarani, Kolkata-700 071, (West Bengal).	Jharkhand	Singhbhum (West)
V. S. Lad & Sons, Prasanth Nivas, Krishna Nagar, Sandur – 583 119, (Karnataka).	Karnataka	Bellary
R. S. Gharse P.B.No 204, Kadar Manzil, Near Municipality Office, Margao-403 601, (Goa).	Goa	South Goa

(Contd.)

Table 4 (Concl.)

Name & address of producer	Location of mine	
	State	District
Khatau Narbheram & Co. N. V. Ram Complex, At- Barbil-758 035, Keonjhar, (Odisha).	Odisha	Keonjhar
S. B. Minerals, Post Box No. 56, K.R.Road, Hospet, Bellary, (Karnataka).	Karnataka	Bellary
Sandur Manganese & Iron Ore Ltd, At & P.O. Deogiri, Via- Sandur-583 112, Dist. Bellary, (Karnataka).	Karnataka	Bellary
Panduranga Timblo Industries, Subhash Timblo Bhavan, P. B. No 242, Margao-403 601, (Goa).	Goa	South Goa North Goa
Patnaik Minerals Pvt. Ltd, P.O. Bonaikela, Joda, Dist. Keonjhar, (Odisha).	Odisha	Keonjhar
V. S. Dempo & Co. (P) Ltd, Dempo House, Campal, Panaji-403 001, (Goa).	Goa	North Goa



IRON ORE

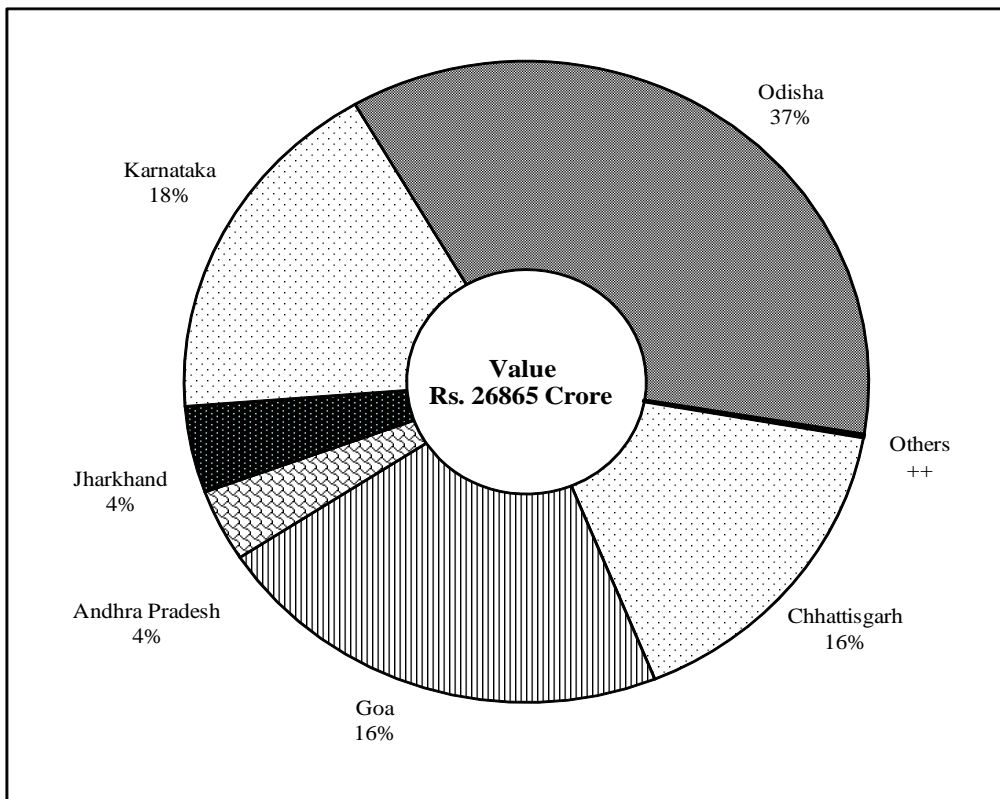
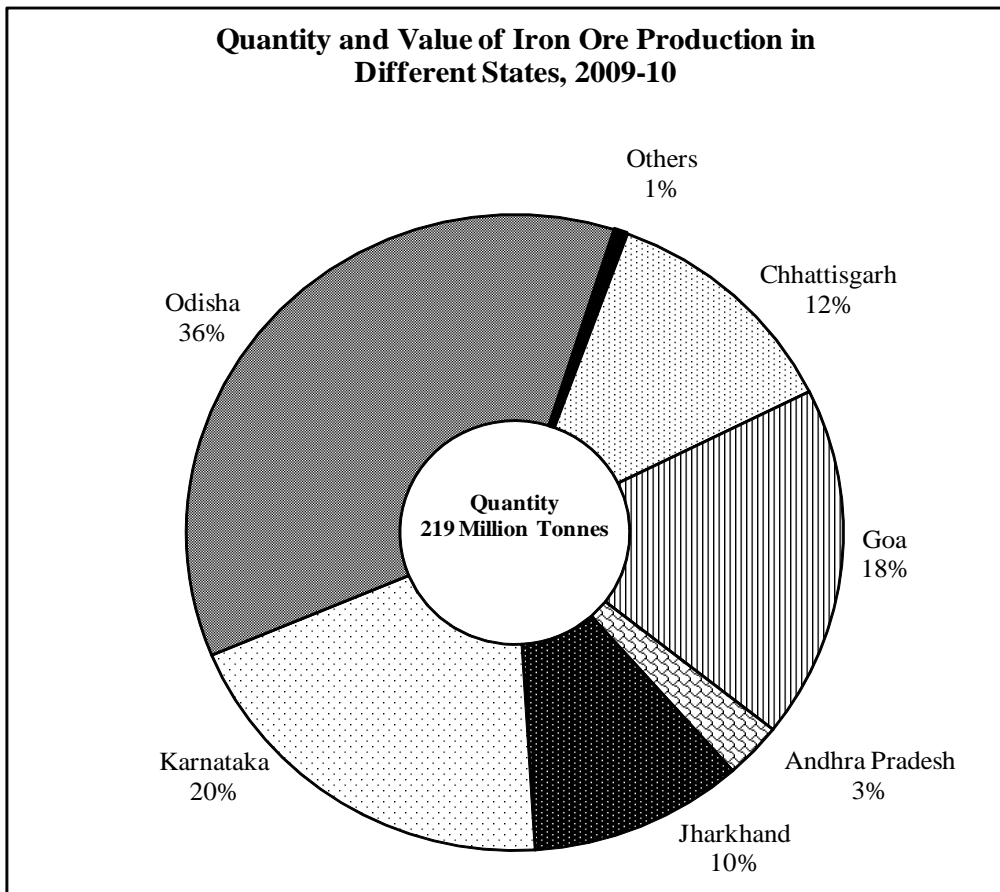
**Table – 5 : Production of Iron Ore, 2007-08 to 2009-10
(By States)**

(Quantity in '000 tonnes; value in Rs. '000)

States		2007-08		2008-09		2009-10(P)	
		Quantity	Value	Quantity	Value	Quantity	Value
India	Total	213250	233792271	212960	285444020	218639	268648395
	Lumps	97854	120678520	92400	148365130	91724	131860737
	Fines	114870	112664926	120054	136655553	126159	136211710
	Concentrates	526	448825	506	423337	756	575948
Andhra Pradesh	Total	9168	11371792	10112	15211659	6205	9780665
	Lumps	5190	7143396	4874	6381572	3446	5332737
	Fines	3978	4228396	5238	8830087	2759	4447928
Chhattisgarh	Total	30997	46894990	29997	59064269	26476	43269647
	Lumps	13032	24026423	11072	32447619	11516	24105051
	Fines	17965	22868567	18925	26616650	14960	19164596
Goa	Total	30526	31879422	31195	48609019	39320	58814667
	Lumps	5730	4998163	5525	9463464	8601	12807039
	Fines	24270	26432434	25164	38722218	29963	45431680
	Concentrates	526	448825	506	423337	756	575948
Jharkhand	Total	20752	10148084	21329	9246556	23008	11713660
	Lumps	9769	5021835	9858	5026145	10712	5997873
	Fines	10983	5126249	11471	4220411	12296	5715787
Karnataka	Total	48990	56852999	46971	57305574	43016	48040941
	Lumps	21532	23294928	18661	24726260	16000	18763765
	Fines	27458	33558071	28310	32579314	27016	29277176
Madhya Pradesh	Total	2256	475995	412	101332	1078	220802
	Lumps	302	34911	87	19612	101	20165
	Fines	1954	441084	325	81720	977	200637
Maharashtra	Total	662	489383	294	236085	250	188287
	Lumps	347	250695	175	137433	147	99524
	Fines	315	238688	119	98652	103	88763
Odisha	Total	69883	75676652	72627	95665250	79274	96617394
	Lumps	41936	55905215	42125	70158749	41189	64732251
	Fines	27947	19771437	30502	25506501	38085	31885143
Rajasthan	Total	16	2954	23	4276	12	2332
	Lumps	16	2954	23	4276	12	2332

IRON ORE

Quantity and Value of Iron Ore Production in Different States, 2009-10



IRON ORE

Table – 6 (A) : Production of Iron Ore, 2008-09
(By Sectors/States/Districts/Grades)

Sector/State/ District	No. of mines	Lumps										Fines											
		Below 60% Fe		60%- 62% Fe		62%- 65% Fe		65% Fe & above		Total		Below 62% Fe		62%- 65% Fe		65% Fe & above		Total		Concentrates		Total	
		Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
India	328(14)	9533	38430	36766	92400	148365130	36220	65342	18492	120054	136655553	506	423337	506	423337	212960	285444020						
Public sector	35	259	14345	11483	26741	58195820	6908	23941	7156	38005	44997407	-	-	-	-	64746	103193227						
Private sector	293(14)	9274	24085	25283	65659	90169310	29312	41401	11136	82049	91658146	506	423337	148214	182250793								
Andhra Pradesh	31(2)	2511	2322	-	4874	6381572	468	4770	-	5238	8830087	-	-	-	-	10112	15211659						
Anantapur	6	1163	2322	-	3485	5952940	-	4770	-	4770	8751382	-	-	-	-	8255	14704322						
Cuddapah	8	997	-	-	997	331248	414	-	-	414	69135	-	-	-	-	1411	400383						
Khammam	1	-	8	-	8	2530	-	-	-	-	-	-	-	-	8	2530							
Krishna	1	4	-	-	4	1911	-	-	-	-	-	-	-	-	4	1911							
Kurnool	14(2)	347	33	-	380	92913	54	-	-	54	9570	-	-	-	434	102483							
Prakasam	1	++	-	-	++	30	-	-	-	-	-	-	-	-	++	30							
Chhattisgarh	12	6	113	2830	8123	32447619	2612	9833	6480	18925	26616650	-	-	-	-	29997	59064269						
Dantewada	3	-	23	535	8116	31816925	1107	5421	6480	13008	24383093	-	-	-	21682	56200018							
Durg	5	-	2239	-	2239	563601	1414	4412	-	5826	2206293	-	-	-	8065	2769894							
Kanker	3	-	18	7	25	12045	-	-	-	-	-	-	-	-	25	12045							
Rajnandgaon	1	6	90	38	134	55048	91	-	-	91	27264	-	-	-	225	82312							
Goa	73	3115	150	-	5525	9463464	21157	4003	4	25164	38722218	506	423337	506	423337	31195	48609019						
North Goa	33	1942	989	46	2977	4571282	11568	1533	-	13101	20000162	63	76094	16141	24647538								
South Goa	40	1173	1271	104	2548	4892182	9589	2470	4	12063	18722056	443	347243	15054	23961481								

(Quantity in '000 tonnes; value in Rs. '000)

(Contd.)

IRON ORE

Table - 6 (A) (Concl.d.)

Sector/State/ District	No. of mines	Lumps										Fines														
		Below 60% - 62% Fe					62% - 65% Fe & above					Total					Below 62% - 65% Fe & above					Total				
		Qty	Value	60% - 62% Fe	62% - 65% Fe & above	Total	Qty	Value	62% - 65% Fe	62% - 65% Fe & above	Total	Qty	Value	62% - 65% Fe	62% - 65% Fe & above	Total	Qty	Value	62% - 65% Fe	62% - 65% Fe & above	Total	Qty	Value	62% - 65% Fe	62% - 65% Fe & above	Total
Jharkhand	21	1129	491	6462	1776	9858	5026145	1589	7264	2618	11471	4220411	-	-	-	21329	9246556									
Singbhum																										
West	21	1129	491	6462	1776	9858	5026145	1589	7264	2618	11471	4220411	-	-	-	21329	9246556									
Karnataka	91(6)	1737	3857	9471	3596	18661	24726260	5805	20099	2406	28310	32579314	-	-	-	46971	57305574									
Bagalkot	2	-	289	-	-	289	173510	659	-	-	659	224162	-	-	-	948	397672									
Bellary	72(4)	1170	2533	8492	3255	15450	21976142	3422	16700	2406	22528	27645182	-	-	-	37978	49621324									
Chitradurga	7(1)	166	454	979	341	1940	2072655	1021	3368	-	4389	4082511	-	-	-	6329	6155166									
Tumkur	10(1)	401	581	-	-	982	503953	703	31	-	734	627459	-	-	-	1716	1131412									
Madhya Pradesh	6(1)	68	19	-	-	87	19612	325	-	-	325	81720	-	-	-	412	101332									
Gwalior	1	51	-	-	-	51	5984	-	-	-	-	-	-	-	-	51	5984									
Jabalpur	4(1)	15	19	-	-	34	12896	325	-	-	325	81720	-	-	-	359	94616									
Sagar	1	2	-	-	-	2	732	-	-	-	-	-	-	-	-	2	732									
Maharashtra	11	164	-	11	-	175	137433	119	-	-	119	98652	-	-	-	294	236085									
Chandrapur	3	81	-	-	-	81	55642	2	-	-	2	1646	-	-	-	83	57288									
Gadchiroli	2	16	-	1	-	17	17417	-	-	-	-	-	-	-	-	17	17417									
Gondia	3	30	-	-	-	30	21596	-	-	-	-	-	-	-	-	30	21596									
Sindhudurga	3	37	-	10	-	47	42778	117	-	-	117	97006	-	-	-	164	139784									
Odisha	82(5)	780	890	17184	23271	42125	70158749	4145	19373	6984	30502	25506501	-	-	-	72627	95665250									
Keonjhar	51(3)	773	352	10277	21760	33162	52883887	1909	15298	6355	23562	21841629	-	-	-	56724	74725516									
Mayurbhanj	6	7	-	93	255	355	370108	-	12	40	52	27786	-	-	-	407	397894									
Sundergarh	25(2)	-	538	6814	1256	8608	16904754	2236	4063	589	6888	3637086	-	-	-	15496	20541840									
Rajasthan	1	23	-	-	-	23	4276	-	-	-	-	-	-	-	-	23	4276									
Jaipur	1	23	-	-	-	23	4276	-	-	-	-	-	-	-	-	23	4276									

IRON ORE

Table – 6 (B) : Production of Iron Ore, 2009-10 (P)
(By Sectors/States/Districts/Grades)

Sector/State/ District	No. of mines	Lumps						Fines						Concentrates		Total	
		Below 60% Fe		62%- 65% Fe		65% Fe & above		Total		Below 62% Fe		65% Fe & above		Total		Qty	Value
		Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
India	319(16)	12004	8460	37984	33276	91724	131860737	43458	61569	21132	126159	136211710	756	575948	218639	268648395	
Public sector	34	461	611	15481	9496	26049	44059708	6067	20215	6921	33203	33901127	-	-	59252	77960835	
Private sector	285(16)	11543	7849	22503	23780	65675	87801029	37391	41354	14211	92956	102310583	756	575948	159387	190687560	
Andhra Pradesh	34(2)	680	151	2615	-	3446	5332737	421	2338	-	2759	4447928	-	-	6205	9780665	
Anantapur	6	-	149	2615	-	2764	5118199	-	2338	-	2338	4372939	-	-	5102	9491138	
Cuddapah	9	390	-	-	-	390	149741	363	-	-	363	65069	-	-	753	214810	
Krishna	2	3	-	-	-	3	695	-	-	-	-	-	-	-	3	695	
Kurnool	16(2)	287	2	-	-	289	64071	58	-	-	58	9920	-	-	347	73991	
Prakasam	1	++	-	-	-	++	31	-	-	-	-	-	-	-	++	31	
Chhattisgarh	10	171	448	3628	7269	11516	24105051	1817	7467	5676	14960	19164596	-	-	26476	43269647	
Dantewada	3	-	7	172	7084	7263	21778529	692	4135	5676	10503	17805523	-	-	17766	39584052	
Durg	5	101	362	3354	-	3817	2069673	1043	3332	-	4375	1343221	-	-	8192	3412894	
Kanker	1	70	79	102	185	436	256849	82	-	-	82	15852	-	-	518	272701	
Rajnandgaon	1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Goa	71	6130	2315	156	-	8601	12807039	26718	3242	3	29963	45431680	756	575948	39320	58814667	
North Goa	28	3143	658	58	-	3859	6291415	13505	1797	-	15302	24600758	18	21884	19179	30914057	
South Goa	43	2987	1657	98	-	4742	6515624	13213	1445	3	14661	20830922	738	554064	20141	27900610	

(Contd.)

IRON ORE

Table - 6 (B) (Conclid.)

Sector/State/ District	No. of mines	Lumps						Fines								
		Below 60% Fe	60%- 62% Fe	62%- 65% Fe	65% Fe & above	Qty	Total Value	Below 62% Fe	62%- 65% Fe	65% Fe & above	Qty	Total Value	Concentrates	Total		
													Qty	Value	Qty	Value
Jharkhand	21	1171	1250	6063	2228	10712	5997873	1165	7930	3201	12296	5715787	-	-	23008	11713660
Singbhum (West)	21(1)	1171	1250	6063	2228	10712	5997873	1165	7930	3201	12296	5715787	-	-	23008	11713660
Karnataka	92(6)	2636	3287	7411	2666	16000	18763765	8116	16562	2338	27016	29277176	-	-	43016	48040941
Bagalkot	2	130	50	-	-	180	94586	204	-	-	204	75797	-	-	384	170383
Bellary	72(5)	1707	2669	7009	1942	13327	16395432	6006	12471	2338	20815	22664040	-	-	34142	39059472
Chitradurga	7	138	252	387	724	1501	1891921	1016	4060	-	5076	5483589	-	-	6577	7375510
Tumkur	11(1)	661	316	15	-	992	381826	890	31	-	921	1053750	-	-	1913	1435576
Madhya Pradesh	6(2)	69	32	-	-	101	20165	977	-	-	977	200637	-	-	1078	220802
Gwalior	1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jabalpur	4(2)	46	32	-	-	78	11531	977	-	-	977	200637	-	-	1055	212168
Sagar	1	23	-	-	-	23	8634	-	-	-	-	-	-	-	23	8634
Maharashtra	12	121	24	2	-	147	99524	103	-	-	103	88763	-	-	250	188287
Chandrapur	3	12	21	1	-	34	22602	56	-	-	56	29849	-	-	90	52451
Gadchiroli	3	8	3	1	-	12	6325	-	-	-	-	-	-	-	12	6325
Gondiya	3	6	++	-	-	6	5774	-	-	-	-	-	-	-	6	5774
Sindhudurga	3	95	-	-	-	95	64823	47	-	-	47	58914	-	-	142	123737
Odisha	72(5)	1014	953	18109	21113	41189	64732251	4141	24030	9914	38085	31885143	-	-	79274	96617394
Keonjhar	44(3)	991	489	8914	19418	29812	46618628	1466	16890	9087	27443	25257700	-	-	57255	71876328
Mayurbhanj	5	-	11	190	99	300	386880	-	85	-	85	80688	-	-	385	467568
Sundargarh	23(2)	23	453	9005	1596	11077	17726743	2675	7055	827	10557	6546755	-	-	21634	24273498
Rajasthan	1	12	-	-	-	12	2332	-	-	-	-	-	-	-	12	2332
Jaipur	1	12	-	-	-	12	2332	-	-	-	-	-	-	-	12	2332

* Reporting only labour.

IRON ORE

**Table – 7 : Production of Iron Ore, 2008-09 and 2009-10(P)
(By Frequency Groups)**

Production Group (in tonnes)	No. of mines		Production for the Group (in '000 tonnes)		Percentage in total production		Cumulative percentage	
	2008-09	2009-10	2008-09	2009-10	2008-09	2009-10	2008-09	2009-10
Total	328(14)	319(16)	212960	218639	100.00	100.00	–	–
Up to 500	7(1)	12(1)	1	1	++	++	++	++
501 - 1000	4	6	3	4	++	++	++	++
1001 - 5000	14	15(2)	39	52	0.02	0.02	0.02	0.02
5001 - 10,000	17(1)	7(1)	141	59	0.07	0.03	0.09	0.05
10001 - 25000	23(4)	18(4)	451	363	0.21	0.17	0.30	0.22
25001 - 50000	19(2)	23(5)	730	1043	0.34	0.48	0.64	0.70
50001 - 100000	31(3)	44	2453	3345	1.15	1.53	1.79	2.23
100001 - 500000	116(2)	94(2)	27878	26653	13.09	12.19	14.88	14.42
500001 - 1000000	34(1)	44(1)	23636	30655	11.1	14.02	25.98	28.44
1000001 - 1500000	24	11	29142	12933	13.69	5.91	39.67	34.35
1500001 - 2000000	13	17	22751	30449	10.68	13.93	50.35	48.28
2000001 and Above	26	28	105735	113082	49.65	51.72	100.00	100.00

**Table – 8 (A) : Mine-head stocks of Iron ore at the beginning of the Year, 2009-10
(By States/Grades)**

(In '000 tonnes)

State	Lumps					Fines				Concen- trates Total	Total Lumps, Fines & Concen- trates
	Below 60% Fe	60%- 62% Fe	62%- 65% Fe	65% Fe & above	Total	Below 62% Fe	62%- 65% Fe	65% Fe & above	Total		
India	4978	3690	11198	5564	25430	18948	24593	5549	49090	81	74601
Andhra Pradesh	194	3	930	++	1127	120	673	1	794	–	1921
Chhattisgarh	3	4	203	936	1146	838	5299	1875	8012	–	9158
Goa	625	547	48	–	1220	1973	440	++	2413	81	3714
Jharkhand	1	144	736	8	889	387	560	++	947	–	1836
Karnataka	1788	2314	4822	927	9851	11631	5207	260	17098	–	26949
Madhya Pradesh	86	++	–	–	86	21	–	–	21	–	107
Maharashtra	40	1	7	–	48	17	8	–	25	–	73
Odisha	2240	677	4452	3693	11062	3961	12406	3413	19780	–	30842
Rajasthan	1	–	–	–	1	–	–	–	–	–	1

**Table – 8 (B) : Mine-head stocks of Iron ore at the end of the Year, 2009-10 (P)
(By States/Grades)**

(In '000 tonnes)

State	Lumps					Fines				Concen- trates Total	Total Lumps, Fines & Concen- trates
	Below 60% Fe	60%- 62% Fe	62%- 65% Fe	65% Fe & above	Total	Below 62% Fe	62%- 65% Fe	65% Fe & above	Total		
India	11324	11500	10130	3590	36544	23580	24373	5652	53605	55	90204
Andhra Pradesh	282	2	92	++	376	187	189	1	377	–	753
Chhattisgarh	32	147	79	367	625	1069	1147	543	2759	–	3384
Goa	870	151	1	–	1022	2353	268	1	2622	55	3699
Jharkhand	306	96	1179	–	1581	422	858	–	1280	–	2861
Karnataka	3824	10342	3496	579	18241	12430	3209	395	16034	–	34275
Madhya Pradesh	289	++	–	–	289	40	–	–	40	–	329
Maharashtra	46	22	7	–	75	10	8	–	18	–	93
Odisha	5674	740	5276	2644	14334	7069	18694	4712	30475	–	44809
Rajasthan	1	–	–	–	1	–	–	–	–	–	1

MINING, MARKETING & TRANSPORT

Iron ore mining is carried out by opencast method by manual, semi-mechanised and mechanised operations.

The characteristics of iron ore vary as per the geological set up. Some ores are found in BHQ which exists as hard massive reef type of deposit while in other places, they occur as friable or powdery form as well as in combinations of both hard massive and powdery form. Hence, the method of mining and deployment of machinery vary from place to place. Large mechanised mines are mostly in the public sector. Manual and semi-mechanised mines are mainly in private sector. Some mechanised mines in Goa, Jharkhand and Odisha are also operated in the private sector.

Manual Mines

Generally, these mines are confined to float ores where mining is done by digging the ore with pickaxes, crowbars, chisels and spades. The mined material is screened manually to separate +10 mm float ore which is then stacked separately. The waste is backfilled into the pits. In some reef workings, 35-40 mm diameter holes are drilled to 0.6 m depth, by hand-held jackhammers at a spacing of about 0.6 m and each hole is charged with 150-200 grams gunpowder or special gelatine cartridges. Blasted tonnage per kg gunpowder is usually 2.5-3 tonnes. Blasted ore is manually loaded into trucks for transport to either railway sidings or to buyer's destination directly. Output per manshift (OMS) is normally between 1.5 and 2 tonnes.

Mechanised Mines

Most mechanised mines are captive ones of different steel plants and have been developed to meet their requirements. Mining is done by formation of systematic benches in overburden and ore. The height of the benches normally varies from 10 to 12 m and width up to 20 m in the ore. Drilling holes of 300 mm diameter and till 12 m depth by crawler drills and use of explosives, such as ANFO, SMS and emulsion explosives for blasting are in practice. Loading is done by earth-moving machinery powered by diesel or electric engines, such as hydraulic excavators in the range from 1.9 cu m to 10 cu m. Ripper dozers and motor graders are also deployed for excavation and levelling purposes. Dumpers/trucks/tippers up to

120-tonne capacity were deployed in mines like Kudremukh (now closed) for transportation.

In some Goan mines, where ore is predominantly in powdery form, hydraulic shovels with boom height of 9 m are used for excavation and loading. Heavy-duty Ripper-Dozers are preferred for mining as Goan ores are soft. Height of the benches is restricted to 7 m for safe and efficient operations. Widths of working benches are maintained at more than 15 m and bench slope is maintained at about 80°. The ore produced is transported to short distances by dumpers of up to 40-tonne capacity. For longer distances and barge loading, dumpers up to 10-tonne capacity are used. The barges carry the ore to harbours. The ore from the barges is loaded to ships either through berth or through transshippers.

Almost all the public sector mines including Kiriburu, Barsua, Gua, Bailadila, Donimalai, Daitari and Dalli-Rajhara operated by SAIL, NMDC and OMC are fully mechanised. Kudremukh iron ore mine of KIOCL is closed since December 2005. In private sector, mines operated in Goa region and Tata Steel's captive mines are mechanised. Approximately, 90% iron ore production comes from mechanised mines. In order to achieve 50 million tpy capacity of production by 2014-15, NMDC has undertaken expansion of deposit 11B mine to 7 million tpy ROM on priority. In view of depleting reserves at Donimalai mine, construction of Kumarswami mine with 7 million tpy capacity is envisaged. The entire project will be executed in 6 packages. NMDC has formed a joint venture company, namely, NMDC-CMDC Ltd. to develop Deposit 13 and Deposit 4 as stand alone projects. Deposit 13 is proposed to have a 10 million tpy capacity, while Deposit 4 will supply raw material to the proposed 3 million tpy integrated steel plant at Nagarnar, Jagdalpur.

The processing of iron ore in the country involves crushing, screening, washing and in some cases beneficiation and agglomeration. Crushing and screening are adopted mainly for sizing the ore and also for removing the adherent gangue minerals. Dry and wet grinding is also resorted to in some cases.

The lumps and fines of iron ore are marketed after washing, screening and beneficiation. Fines are converted into sinters for use in steel plants while pellets made from concentrates/fines are predominantly exported and also are utilised for internal consumption in sponge iron units.

ENVIRONMENTAL FACTORS

Afforestation, waste dump management, top soil management, management of subgrade minerals, mechanical beneficiation, dust suppression, monitoring of water and air quality, vibration survey, publicity and propaganda are some common environmental restoration efforts pursued by all mechanised and semi-mechanised iron ore mines. Mining and beneficiation of ores carried out on large-scale cause environmental problems. A specific problem to iron ore mining is the disposal of tailings and other deleterious silica minerals and phosphorus. To safeguard the environment and prevent ecological degradation, thrust has been laid on green belt development, solid waste management, monitoring of liquid and air effluents and other crucial environmental parameters.

Goa region is prone to siltation of agricultural fields, nallahs, riverbeds and creeks due to wash off from iron ore dumps in rainy season. Loss of crop yield and reduction in fish population in streams and navigation difficulties are the problems due to silting. To overcome the problems, check dams and water filter beds at higher contours have been constructed. Tailing ponds are also being maintained at some mines. Afforestation is the mainstay in reclaiming the mined out areas in Goa. In a few cases, pits are used as water reservoir for pisciculture.

In Bellary-Hospet area, Karnataka, dust concentration (suspended particulate matters) is the main environmental problem. Environmental concerns had led to closing down of mining operations at Kudremukh iron ore mine of KIOCL in December 2005 in compliance with the order passed by the Hon'ble Supreme Court in this regard. In Bailadila sector, Chhattisgarh, forest is fairly widespread and dense, supported by good rainfall and rich flora and fauna. The deforestation taking place due to mining and waste dumping needs to be compensated continuously by afforestation at suitable slopes and in township areas. In Jharkhand, afforestation of land is the main recourse adopted for reclamation of degraded lands or improvement in land uses.

INDUSTRY

Iron ore is the basic raw material used for making pig iron, sponge iron and finished steel. The iron ore is used mainly in blast furnaces, mini-

blast furnaces (MBF), DRI and sintering and pelletisation plants.

Pelletisation

In general, the pelletisation process involves mixing of iron ore and required limestone with water which later is ground in ball mills to the desired size. The discharged slurry from ball mills is filtered in pressure filters. The filter cake from filters is then mixed with dry-ground coke fines to which bentonite is mixed in suitable proportion to form green pellets in pelletising discs. The coke fines and bentonite are ground separately. The green pellets are then dried, heated and fired in indurating machine to produce iron ore pellets. There is an increasing trend for utilisation of pellets or sinters in the recent years. The use of pellets as feed in the blast furnace has several advantages because of their uniform size, known composition and strength.

The seven pelletisation plants in the country about which information is available have a total capacity of 23.35 million tonnes per annum. The pellet plant of JSW Steel Ltd (formerly Jindal Vijayanagar Steel Ltd) at Vijaynagar, Bellary district, Karnataka, has annual capacity of 4.2 million tonnes. This pellet plant reportedly supplies 1.5 million tonnes pellets to its Corex Plant and exports around 2 million tonnes. The pellet plant uses coal fines and also off-gases from the power plant to reduce production cost. Jindal Steel & Power Ltd is setting up a 10 million tpy pellet plant at Barbil, Odisha that will utilise the huge stocks of iron ore fines lying with various iron ore mines in Odisha. The first module of 5 million tpy was put through trial runs since January 2010. It produced 0.23 million tonnes pellets by the end of 2009-10 against present installed capacity of 4.5 million tpy. The project will conserve precious resources by converting unused fines into pellets for usage in DRI production.

Essar Steel Pelletisation plant at Visakhapatnam has installed capacity of 8 million tonnes per annum. After meeting its own requirement at its hot briquetted iron (HBI) plant in Hazira, Gujarat, Essar supplies pellets to both domestic and international markets. The plant has an assured supply of high quality iron ore from the captive 8 million tpy beneficiation plant at Bailadila, Chhattisgarh. The iron ore slurry is pumped through a 267 km pipeline, the second largest in the world, to the pellet plant at Visakhapatnam.

KIOCL's pellet plant capacity was expanded to 4 million tonnes per annum with additions/modifications and installation of 0.5 million tonne Shaft Pelletisation Furnace. Owing to environmental concerns and consequent upon the Hon'ble Supreme Court's order thereupon effective 31st December 2005, mining activity at Kudremukh by KIOCL was halted. Alternatively, the Government's decision to allot iron ore from Donimalai deposits to KIOCL's Mangalore Pellet Plant which has a capacity 3.5 -37 million tonnes pellets per annum, has furthered the prospects for pellet production. An arrangement has also been made to transport fine ore by train from Bellary-Hospet region to the Pellet Plant at Mangalore. KIOCL has installed three grinding facilities at the Mangalore Pellet Plant to crush iron ore received from Bellary sector. The grinding mill can process 15,000 tpd fines below 10 mm to produce 12,000 tpd pellet feed. These alternative arrangements have saved the Pellet plant at Mangalore from closure. KIOCL's pellets have excellent export market.

NMDC is in the process of setting up two plants- one at Bacheli with 2 million tpy capacity and the other at Donimalai with 1.2 million tpy capacity. The Donimalai pellet plant is scheduled to be completed by March 2013. the pellet plant at Bacheli is now on hold and is being relocated from Bacheli, Dantewada to Nagarnar, Jagdalpur, adjacent to the proposed 3 million tpy integrated steel plant. The project received environmental clearance on 15.9.2009 and the Feasibility Report was approved on 7.1.2010.

The pelletisation plants of Tata Steel at Noamundi and Chowgule & Co. Pvt. Ltd at Pale, Goa are not in operation.

Sintering

The eight sintering plants in the country have annual capacity of 28.62 million tonnes. All integrated steel plants except IISCO Steel Plant (ISP) have their own sintering plants. These plants receive raw material mostly from their captive mines. Two sintering plants have come on stream, namely, Neelachal Ispat Nigam Ltd, Odisha (1,711 thousand tonnes) and SISCO, Mettur, Tamil Nadu (127.5 thousand tonnes), taking the annual capacity to about 30.45 million tpy. Ispat Metallics Ltd, a Group Company of Ispat Industries Ltd, has newly commissioned a 2.240 million tpy capacity sinter plant at the Dolvi Complex in Raigarh district, Maharashtra.

Pellets along with sinters have resulted in growth in utilisation of iron ore fines and blue dust. Information on capacity and production of pellets and sintering plants is given in Table-9.

Pig Iron

Pig iron is one of the basic raw materials required by foundry and casting industry for manufacturing various types of castings for the engineering sector. The post-liberalisation regime, has witnessed expressions of interest from a large number of entrepreneurs for setting up mini-blast furnaces for production of hot metal/pig iron. Commissioned pig iron units are mostly of stand-alone-type. Three units, namely, M/s Usha Martin Industries Ltd, M/s Jindal Steel & Power Ltd and Ispat Industries Ltd have integrated the mini-blast furnaces (MBF) and are using the hot metal in the charge-mix directly for manufacturing steel through electric arc furnace (EAF). Two units, in Karnataka (M/s Hospet Steel, a joint venture of Kalyani & Mukand) and in Tamil Nadu (M/s Southern Iron & Steel Company Ltd) have integrated their MBF with energy optimising furnace (EOF) for manufacturing steel. The excess hot metal produced by them supplements the pig iron production. Tata Metalliks Ltd, a subsidiary of Tata Steel, has been manufacturing pig iron at its plants located at Kharagpur in West Bengal and Redi in Maharashtra and has been catering to the domestic demand.

At JSW Steel Ltd (formerly Jindal Vijaynagar Steel Limited) in Karnataka, besides MBF, a Corex Plant (alternative to conventional MBF/BF) supplements the production of pig iron along with downstream steel making facilities. Ispat Metallics (India) Ltd has set up a large blast furnace to produce 2 million tonnes per annum hot metal/pig iron at Dolvi, Raigad in Maharashtra. The excess hot metal, after meeting the requirements of the parent company, viz Ispat Industries Ltd, for manufacturing steel, is made available as pig iron for sale. M/s Neelachal Ispat Nigam Ltd had commissioned a blast furnace with 1.1 million tpy hot metal capacity and started production of pig iron at Dubari in Jajpur district of Odisha. Visa Steel Ltd commissioned a pig iron plant in March 2005, having a capacity of 2.25 lakh tonnes per annum at Kalinganagar in Odisha.

The gross pig iron manufacturing capacity in the country was about 4.833 million tonnes.

Total production of pig iron in the country in 2009-10 was 5.73 million tonnes. The contribution of private sector units in the overall production of pig iron in the country continued to increase and accounted for about 87% production in 2009-10.

Sponge Iron

India is the largest producer of sponge iron in the world. The growth of sponge iron industry during the last few years in terms of capacity and production has been substantial. The installed capacity of sponge iron increased from 1.52 million tonnes per annum in 1990-91 to around 30.9 million tonnes in 2008-09. Production has increased from 0.9 million tonnes in 1990-91 to 20.74 million tonnes in 2009-10. There were 324 sponge iron units in the country. Out of these, 3 gas-based units had a capacity of about 8 million tonnes per annum and the rest were coal-based units. JSP Raigarh, Chhattisgarh is setting up a 2 million tpy gas-based DRI plant that is scheduled for completion by 2011. The plant will use gas produced by coal gasification.

Sponge iron is a good substitute for scrap which is required by the electric arc furnaces and induction furnaces or mini-steel plants in the country. The availability of indigenous metal scrap is scarce and therefore to meet the domestic demand scrap is usually imported. Sponge iron is a viable alternative for scrap and is produced by direct reduction of high-grade iron ore or pellets to metallic iron ore in solid state by using coal or natural gas as reductant. It is also known as Direct Reduced Iron (DRI) or Hot Briquetted Iron (HBI).

Iron & Steel

The details of the Iron & Steel Industry are provided in the Review on "Iron & Steel and Scrap".

Ferro-alloys

Iron is an important constituent of ferro-alloys, like ferro-manganese (high carbon, medium carbon and low carbon), ferro-silicon, ferro-chrome (high carbon and low carbon)/charge-chrome, ferro-molybdenum, ferro-vanadium, ferro-tungsten, ferro-silicon-magnesium, ferro-aluminium, ferro-silicon-zirconium, ferro-titanium, etc. Ferro-alloys in turn

are either used in steel industries to impart some special qualities or are exported. Ferro-alloys Industry has an annual capacity of producing over 3.64 million tonnes. The production was almost 2.36 million tonnes and 2.22 million tonnes in 2007-08 and 2008-09, respectively. The details about the ferro-alloys industry are provided in the Review on 'Ferro-Alloys'.

Cement

Iron ore lumps and powder containing +58% Fe are normally used in the Cement Industry as they improve burning properties, impart colour and balance the composition of the mix. Further details about the Cement Industry are provided in the Review on 'Cement'.

Coal Washeries

Magnetite ore is used as heavy media in coal washeries. There are 19 washeries for coking coal and 31 washeries for non-coking coal with 32.80 million tpy and 103.65 million tpy raw coal capacity, respectively, during 2009-10. Details on the coal washeries are provided in the Review on 'Coal & Lignite'.

USES & SPECIFICATIONS

Iron ore is used mainly for manufacturing of pig iron, sponge iron and steel. It is also used in cement, coal washeries, ferro-alloys, foundry, vanaspati and glass industries. General user specifications of iron ore/fines/concentrates used in making pellets/sinters are given in Table - 9. The specifications of iron ore consumed by major sponge iron plants are furnished in Table - 10 and by major steel plants in Tables - 9, 10 and 11.

CONSUMPTION

In 2009-10, about 90.62 million tonnes iron ore was consumed in various industries like iron & steel, sponge iron, ferro-alloys, alloy steel, coal washery and cement. Iron & steel including sponge iron were major consumer of iron ore and accounted for 98% of its consumption. Plantwise consumption of iron ore in steel plants is furnished in Table-11. Industrywise consumption of iron ore from 2007-08 to 2009-10 is given in Table-12.

IRON ORE

**Table – 9 : Installed Capacity & Production of Pellets/Sinters
(By Plants)**

(In '000 tonnes)

Name & location of Plant	Annual installed capacity	Production		Iron ore fines consumed		General specification of concentrates/fines used
		2008-09	2009-10	2008-09	2009-10	
A) Pellet Plants :						
i) Kudremukh Iron Ore Co. Ltd, Panambur, Mangalore, Karnataka.	3500	1316	1272	1559	1275	Fe 64% , SiO ₂ + Al ₂ O ₃ 6% (max) S 0.05%, P 0.08% (max) Size - 10 mm.
ii) Mandovi Pellets Ltd, Near Borim Bridge, Shiroda, Goa – 403 103.	1800	297	NA	308	NA	Fe 62%, SiO ₂ 2 to 3.5%, Al ₂ O ₃ 1.35 to 2%, Size -10 mm.
iii) JSW Steel Ltd, Bellary, Karnataka.	4200	NA	NA	NA	NA	Fe 62%, Size -10 mm
iv) Tata Steel Ltd. Noamndi, Jharkhand.	800	Nil	Nil	Nil	Nil	(Lying closed)
v) Chowgule & Co. Ltd. Pale, Goa.	550	Nil	Nil	Nil	Nil	(Lying closed)
vi) Essar Steel Ltd, Visakhapatnam, Andhra Pradesh.	8000	NA	NA	NA	NA	NA
vii) Jindal Steel & Power Ltd.	4500	Nil	227	NA	NA	NA
B) Sintering Plants :						
i) Bokaro Steel Plant, Jharkhand.	6200	4446	4545	4346	4014	Fe 63.88% (max), SiO ₂ -5.19%, max., Al ₂ O ₃ 2.69% (Av), Size -3 mm.
ii) Bhilai Steel Plant, Bhilai, Chhattisgarh.	6334	7459	7459	5395	5390	Fe 62.6% (min), Size -0-10 mm or <10% & 1 mm or >75%
iii) Durgapur Steel Plant, West Bengal.	3009	2765	2861	2278	2338	Fe >63% ,SiO ₂ 2.17 to 4.54%, Al ₂ O ₃ 2.38 to 3.03%. Size +10 mm <10% & 1 mm >75%
iv) Rourkela Steel Plant, Odisha	3070	2292	3391	2598	104	Fe 62.83%, SiO ₂ 2.48%, Al ₂ O ₃ 3.04%, Size -10 mm.
v) Visakhapatnam Steel Plant, Andhra Pradesh.	5256	5033	5310	3718	3952	Fe 64.50% (min), Al ₂ O ₃ 3.0% (max), SiO ₂ 3%, (max) Size (-) 10 mm.
vi) Tata Steel Ltd, Jamshedpur, Jharkhand.	7500	6531	7662	6091	7645	NA
vii) IDCOL, Kalinga, Keonjhar, Odisha	8	NA	NA	NA	NA	Fe 62% min., Al ₂ O ₃ + SiO ₂ 8% max., moisture 4%, SiO ₂ 1.5-5%.
viii) Ispat Industries Ltd, Dolvi, Raigad, Maharashtra.	2240	NA	NA	NA	NA	NA

(Contd.)

IRON ORE

Table - 9 (Concl.)

Name & location of Plant	Annual installed capacity	Production		Iron ore fines consumed		General specification of concentrates/fines used
		2008-09	2009-10	2008-09	2009-10	
ix) Neelachal Ispat Nigam Ltd, Kalinga Nagar, Industrial Complex, Dubori-755 026, Dist. Jajpur, Odisha	1711	752	859	633	715	Fe 63% (min.), Size + 10 mm 7% max
x) SISCO, Mettur, Tamil Nadu.	127.5	NA	NA	NA	NA	NA
xi) Jindal Steel & Power Ltd, Raigarh, Chhattisgarh.	2300	NA	NA	NA	NA	NA
xii) Jayaswal Necco Industries Ltd, Sitara Growth Centre, Raipur-493 221, Chhattisgarh.	800	NA	NA	NA	NA	NA
xiii) Bhushan Power & Steel Ltd Sambalpur, Odisha	1000	NA	NA	NA	NA	NA

Table – 10 : Specifications of Iron Ore Consumed by Major Sponge Iron Plants

Sl. No.	Name of the Plant	Size	Specifications			
			Fe	Al ₂ O ₃ + SiO ₂	P	S
1.	Orissa Sponge Iron Plant	5-18 mm	65% min	4.5% max	0.03% max	N. A.
2.	Vikram Ispat	9-16 mm	66%	2.6% max	0.05%	0.01%
3.	HEG Ltd	5-18 mm	65% min	5% max	0.05%	0.03%
4.	Sunflag Iron & Steel Ltd	5-20 mm	67.5%	–	–	–
5.	Sponge Iron India Ltd	6-20 mm	55-58% & 64-66%	–	–	–
6.	Essar Steel Ltd	10-40 mm	67%	2.60% max	0.05%	0.01%
7.	Jindal Steel & Power Ltd	10-30 mm	65% min	3% max (SiO ₂)	0.05%	–
8.	Tata Sponge Iron Ltd	5-18 mm	65% min	5% max	–	–
9.	GSAL India Ltd	10-40 mm	62%	–	–	–
10.	Raipur Alloys & Steel Ltd	5-18 mm	65-66%	–	–	–
11.	OCL India Ltd	Sized	62% min	–	–	–
12.	Nalwa Steel & Power Ltd	5-20 mm	63% min	–	–	–
13.	Shri Bajrang Power & Ispat Ltd	5-18 mm	64% min	–	–	–
14.	Jai Balaji Industries Ltd	5-18 mm 10-30 mm 10-150 mm	65% – –	5% – –	0.05% – –	0.03% – –

IRON ORE

**Table – 11 : Consumption and Specifications of Iron Ore, 2008-09 and 2009-10
(By Steel Plants)**

(In '000 tonnes)

Steel plant	Iron ore consumption						Specifications
	Blast furnace (BF)				Steel melting shop (SMS)		
	2008-09		2009-10		2008-09	2009-10	
	Lumps	Fines (in sinters/ pellets)	Lumps	Fines (in sinters/ pellets)			
Bokaro Steel Plant, Bokaro, Jharkhand.	2107	4287	2363	3985	–	–	Lumps : Fe 63.40%, SiO ₂ 2.25%, Al ₂ O ₃ 2.39% Size-10 - 40 mm, Fines : Fe 62.24%, SiO ₂ 3.36%, Al ₂ O ₃ 3.45%
Bhilai Steel Plant, Bhilai, Chhattisgarh.	3109	5395	2992	5390	40	50	BF : Fe-64% (min), Size-10 - 40 mm, SMS : Fe 66%, (min), Size 40 - 100 mm, Sinters: Fe 62.6% (min), Size - 0-10 mm
Rourkela Steel Plant Rourkela, Odisha.	1062	2598	1600	2216	21	104	Lumps : Fe 63.54%, SiO ₂ 1.78%, Al ₂ O ₃ 2.48%, Size-10 to 50 mm, Fines:Fe 62.21% SiO ₂ 2.96%, Al ₂ O ₃ 3.01%, Size -10 mm
Durgapur Steel Plant, Durgapur, West Bengal.	1060	2278	1203	2353	10	15	Lumps : Fe 62.48% Al ₂ O ₃ 2.42%, Size-10 - 50 mm, Fines : Fe 62.8% SiO ₂ 2.28%, Size -10 mm
IISCO Steel Plant, Burnpur, West Bengal.	1150	NA	960	NA	15	18	Lumps : Fe 62.86%, SiO ₂ 2.56%, Al ₂ O ₃ 2.56% (max.) Size- 10-40 mm
Visvesvaraya Iron & Steel Ltd., Bhadravati, Karnataka.	273	NA	222	NA	NA	NA	Fe 62.97%, SiO ₂ 2.85%, Al ₂ O ₃ 2.43% , Size 10 -40mm
Visakhapatnam Steel Plant, Visakhapatnam, Andhra Pradesh.	1439	3718	1156	3952	4488	4691	Lumps: Fe 65.5% min, Al ₂ O ₃ 1.60% max, SiO ₂ 2.25% max, Size 10-150 mm for BF, Fines : Fe 64.5% min, Al ₂ O ₃ 3.0%, SiO ₂ 3.00% max, Size - 10 mm.
Tata Steel Ltd, Jamshedpur, Jharkhand.	3047	6091	3555	7223	263	340	Fe 66.63 Size + 10 mm

(Contd.)

IRON ORE

Table - 11 (Concl.)

Steel plant	Iron ore consumption						Specifications
	Blast furnace (BF)				Steel melting shop (SMS)		
	2008-09		2009-10		2008-09	2009-10	
	Lumps	Fines (in sinters/ pellets)	Lumps	Fines (in sinters/ pellets)			
IDCOL, Kalinga Iron Works, NA P.O. Matkarmbeda -758 036, Barbil, Dist. Keonjhar, Odisha.		NA	NA	NA	NA	NA	Fe 65% SiO ₂ + Al ₂ O ₃ 5% max, Size - 10 to 30 mm.
Visa Steel Ltd., Kalinga Nagar, Industrial Complex, At & Post Jakhapura Jajpur, Odisha	150	48	307	327	-	-	Fe - 62%-64%, Size 10 - 40 mm in BF Fe -62% -64%, Size in DRI : 5-18mm, 10-40 mm & 10-180 mm.
Neelachal Ispat Nigam Ltd, Kalinga Nagar, Industrial Complex, Duburi -755 026, Jajpur, Odisha.	210	633	NA	NA	-	-	Lumps : Fe 65% (min) Size + 40 mm Fe 63% (min) Size +10 mm

**Table – 12 : Reported Consumption of Iron Ore* 2007-08 to 2009-10
(By Industries)**

Industry	(In tonnes)		
	2007-08(R)	2008-09(R)	2009-10(P)
All Industries	85278200	87411600	90617000
Alloy steel	291000 (5)	291000 (5)	291000 (5)
Cement	1021600 (54)	1069300 (55)	1166000 (55)
Coal washery **	43500(15)	33900 (15)	33900 (15)
Ferro-alloys	5400 (8)	8200 (8)	8100 (8)
Iron & steel	51305500 (14)	52262100 (17)	53066800 (17)
Sponge iron	32608000 (e)	33744000 (e)	36048000 (e)
Others (chemical, foundry, glass, refractory)	3200 (10)	3100(10)	3200 (10)

Figures rounded off. Data collected on non-statutory basis.

Figures in parentheses denote the number of units in organised sector reporting* consumption.

(*Includes actual reported consumption and/or estimates made wherever required).

* Does not include consumption of pellets & sinters; includes consumption of iron ore(fines) consumed in the production of pellets & sinters.

** Magnetite.

TRADE POLICY

As per the Foreign Trade Policy (FTP) for 2009-2014 and the amended Export and Import Policy incorporated in the FTP, the present

export policy (2009-10) for iron ore is furnished below in brief. The imports of iron ore lumps, fines, concentrates and agglomerated pellets are freely allowed.

Item	Export Policy	Nature of restrictions
(1) Iron ore other than those specified under Free category	STE	Export through MMTC
(2) Iron ore of Goa origin when exported to China, Europe, Japan, South Korea and Taiwan, irrespective of the Fe content	Free	
(3) Iron ore of Redi origin supplied to all markets, irrespective of the Fe content	Free	
(4) All iron ores of Fe content up to 64%	Free	
(5) Iron ore concentrate prepared by beneficiation and/or concentration of low-grade ore containing 40% or less iron produced by KIOCL	STE	Export through KIOCL, Bengaluru
(6) Iron ore pellets manufactured by KIOCL	STE	Export through KIOCL, Bengaluru
(7) Rejects of iron ore chips and like generated from the manufacturing process after using imported raw material	Free	(i) The quantity of export of such rejects shall not be more than 10% of the imported raw materials i.e. pellets (ii) The size of the rejected pellets chips (fines) shall be less than 6 mm

Source: *Export-Import Policy, 2009-14.*

STE: *State Trading Enterprise.*

WORLD REVIEW

The world reserves of crude iron ore is estimated to be around 160 billion tonnes. The iron content in the iron ore reserves is estimated to be around 77 billion tonnes. The world reserves of crude iron ore and iron content by principal countries is given in Table - 13.

In 2009, the world production of iron ore was 2,248 million tonnes as against 2,214 million tonnes in the previous year. China, Australia, Brazil, India and Russia were the principal producers. The world production of iron ore is given in Table-14.

Australia

Rapid Growth Project 4 of BHP Billiton was completed with the opening of the company's center for mining, crushing and screening in the Eastern Pilbara region of Western Australia which consequently has raised the production capacity

to 155 million tpy. The company further plans to raise the production capacity to 300 million tpy by 2015. Fortescue Metals has proposed to double its iron ore production to 90 million tpy.

Brazil

The Vergem Grande Pellet Plant continued with the construction of two new pellet plants namely, Tubarao VIII (16.5 million tpy) and another in Oman (9.8 million tpy).

Canada

Consolidated Thompson Iron Mines Ltd along with its scheduled plan to produce 8 million tpy iron ore at its Bloom Lake iron ore mine in Quebec has further expansion plans to raise production to 16 million tpy. First production was expected in 2010. Labrador Iron Mines Holding Ltd.'s planned western Labrador operations were slated to begin production in mid-2010.

China

The newly discovered Dataigou deposit, Liaoning Province has an estimated 3 billion tonnes iron ore reserves of grade range of 25-62% Fe that are located 1.2-2 km below surface. Another find with one billion tonnes reserves with average 35% Fe grade was identified 100-600 m below the surface located at in Macheng deposit in Luannan, Hebei Province.

Liberia

Construction and development of Nimba mine of Arcelor Mittal was to start during 2010 and first shipment of iron ore was slated for late 2011.

Peru

Peruvian operations of the Chinese Shougang Group were to double production capacity to 10 million tpy by 2010.

South Africa

Kolomela mine (earlier known as Sishen South Mine) of Kumba Iron Ore Ltd was expected to start production of iron ore in 2012 at 9 million tpy capacity.

FOREIGN TRADE

Exports

Exports of iron ore increased to 101.53 million tonnes in 2009-10 from 68.90 million tonnes in the previous year. In terms of value, too, the iron ore exports rose to Rs. 28366 crore in 2009-10 from Rs. 21725 crore in 2008-09. The exports in 2009-10 in terms of volume comprised iron ore fines (90%), iron ore lumps (9%), and iron ore concentrates & iron ore pellets (1%). Exports were mainly to China (86%) and Japan, Hong Kong (5% each) (Tables - 15 to 20).

Imports

Imports of iron ore were 897 thousand tonnes in 2009-10 as compared to 69 thousand tonnes in the previous year. The imports in 2009-10 comprised mostly iron ore pellets from Bahrain, Ukraine, Russia, Finland & Brazil (Tables - 21 to 25).

Table – 13 : World Reserves of Iron Ore (By Principal Countries)

(In million tonnes)

Country	Reserves	
	Crude ore	Iron content
World : Total (rounded)	160000	77000
Australia	20000	13000
Brazil	16000	8900
Canada	1700	1100
China	22000	7200
India*	7000	4500
Iran	2500	1400
Kazakhstan	8300	3300
Mauritania	700	400
Mexico	700	400
Russia	25000	14000
South Africa	1000	650
Sweden	3500	2200
Ukraine	30000	9000
USA	6900	2100
Venezuela	4000	2400
Other countries	11000	6200

Source: Mineral Commodity Summaries, 2010.

* India's resources of iron ore as per UNFC system as on 1.4.2010 (P) are estimated at 28.53 billion tonnes.

Table – 14 : World Production of Iron ore (By Principal Countries)

(In million tonnes)

Country	2007	2008	2009
World : Total	2052	2214	2248
Australia	299	343	394
Brazil	355	351	327
Canada *	33	32	32
China	707	824	880
India **	213	215	213
Iran	35	38 ^e	38 ^e
Kazakstan	20	21	22
Russia	105	100	92
South Africa @	42	49	55
Sweden	25	24	18
Ukraine	78	73	66
USA	52	54	26 ^e
Venezuela	21	21	21 ^e
Other countries	67	69	64

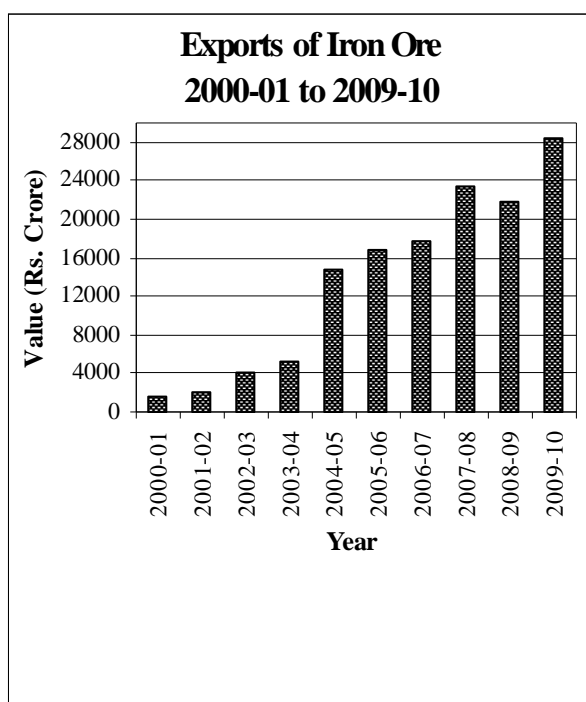
Source: World Mineral Production, 2005-2009

@ Including by-product magnetite

*including by-product iron ore

** India's production of iron ore in 2007-08, 2008-09 and 2009-10 was 213.25 million tonnes, 212.96 million tonnes and 218.64 million tonnes, respectively.

IRON ORE



**Table – 15 : Exports of Iron ore : Total
(By Countries)**

Country	2008-09		2009-10	
	Qty (‘000 t)	Value (Rs. ‘000)	Qty (‘000 t)	Value (Rs. ‘000)
All Countries	68904	217253097	101531	283661742
China	63342	199127315	87024	242638494
Japan	3601	11759509	4989	14844263
Hong Kong	58	437781	4759	12719345
Korea, Rep. of	753	2139433	1101	2993033
Singapore	81	421126	723	2219475
Australia	–	–	659	1993776
Switzerland	–	–	641	1960025
Macao	47	139557	429	1197430
Pakistan	379	1653506	–	–
Unspecified	182	362891	126	336618
Other countries	461	1211979	1080	2759283

**Table – 16 : Exports of Iron ore : Lumps
(By Countries)**

Country	2008-09		2009-10	
	Qty (‘000 t)	Value (Rs. ‘000)	Qty (‘000 t)	Value (Rs. ‘000)
All Countries	8344	26009673	9701	26092192
China	6125	18403065	7824	20537840
Japan	1615	5601056	1263	4042521
Hong Kong	–	–	341	680420
Australia	–	–	130	422338
Singapore	–	–	58	187104
UAE	–	–	51	136980
Korea, Rep. of	295	730872	34	84985
Bangladesh	++	36	–	–
Pakistan	309	1274641	–	–
UK	++	3	–	–
Other countries	–	–	++	4

**Table – 17 : Exports of Iron Ore : Fines
(By Countries)**

Country	2008-09		2009-10	
	Qty (‘000 t)	Value (Rs. ‘000)	Qty (‘000 t)	Value (Rs. ‘000)
All Countries	58458	179843910	91045	255552349
China	55116	169328467	78434	220135821
Hong Kong	58	437781	4418	12038925
Japan	1986	6158453	3726	10801742
Korea, Rep. of	458	1408561	1048	2857043
Singapore	81	421126	665	2032368
Switzerland	–	–	641	1960025
Australia	–	–	529	1571261
Macao	47	139557	429	1197430
Bangladesh	102	242888	102	406129
Unspecified	182	362891	126	336618
Other countries	428	1344186	927	2214987

IRON ORE

Table – 18 : Exports of Iron Ore : Concentrates Non agglomerated (By Countries)

Country	2008-09		2009-10	
	Qty ('000 t)	Value (Rs. '000)	Qty ('000 t)	Value (Rs. '000)
All Countries	1193	4396081	498	1276716
China	1192	4393847	479	1225160
Korea, Rep. of	-	-	19	51005
UAE	-	-	++	225
Malaysia	-	-	++	136
Nepal	++	3	++	69
Seychelles	-	-	++	44
Guatemala	-	-	++	43
Pakistan	++	210	-	-
Philippines	++	411	-	-
South Africa	1	1610	-	-
Other countries	-	-	++	34

Table – 19 : Exports of Iron Ore : Pellets (By Countries)

Country	2008-09		2009-10	
	Qty ('000 t)	Value (Rs. '000)	Qty ('000 t)	Value (Rs. '000)
All Countries	909	7002286	287	739673
China	909	7001936	287	739673
Bahrain	++	350	-	-

Table – 20 : Exports of Iron Ore : Pyrites (By Countries)

Country	2008-09		2009-10	
	Qty ('000 t)	Value (Rs. '000)	Qty ('000 t)	Value (Rs. '000)
All Countries	++	1147	++	812
South Africa	-	-	++	474
Australia	-	-	++	177
Bangladesh	-	-	++	62
Malawi	-	-	++	57
UAE	-	-	++	42
Nepal	++	1147	-	-

Table – 21 : Imports of Iron Ore : Total (By Countries)

Country	2008-09		2009-10	
	Qty ('000 t)	Value (Rs. '000)	Qty ('000 t)	Value (Rs. '000)
All Countries	69	611112	897	4681128
Bahrain	69	604776	270	1575032
Ukraine	-	-	226	1128411
Australia	-	-	152	780071
Russia	-	-	99	527663
Finland	++	1804	91	466164
Brazil	-	-	36	197152
Austria	++	1817	++	2576
China	++	636	13	2488
UAE	++	124	++	799
USA	++	519	++	18
Other countries	++	1436	10	754

Table – 22 : Imports of Iron Ore : Fines (By Countries)

Country	2008-09		2009-10	
	Qty ('000 t)	Value (Rs. '000)	Qty ('000 t)	Value (Rs. '000)
All Countries	-	-	152	779767
Australia	-	-	152	779767

Table – 23 : Imports of Iron Ore : Concentrates Non-agglomerated (By Countries)

Country	2008-09		2009-10	
	Qty ('000 t)	Value (Rs. '000)	Qty ('000 t)	Value (Rs. '000)
All Countries	++	805	10	1601
UAE	++	124	++	798
Sweden	-	-	10	483
Australia	-	-	++	304
Canada	-	-	++	16
Austria	++	152	-	-
Indonesia	++	68	-	-
Kenya	++	461	-	-
Other countries	-	-	-	-

**Table – 24 : Imports of Iron Ore : Pellets
(By Countries)**

Country	2008-09		2009-10	
	Qty (‘000 t)	Value (Rs. ‘000)	Qty (‘000 t)	Value (Rs. ‘000)
All Countries	69	604776	721	3889791
Bahrain	69	604776	270	1575032
Ukraine	–	–	226	1128411
Russia	–	–	99	527663
Finland	–	–	90	461533
Brazil	–	–	36	197152

**Table – 25 : Imports of Iron Ore : Pyrites
(By Countries)**

Country	2008-09		2009-10	
	Qty (‘000 t)	Value (Rs. ‘000)	Qty (‘000 t)	Value (Rs. ‘000)
All Countries	++	5531	14	9969
Finland	++	1804	1	4631
Austria	++	1665	++	2576
China	++	636	13	2488
Germany	++	252	++	255
USA	++	519	++	17
Italy	++	7	++	2
Netherlands	++	273	–	–
South Africa	++	375	–	–

FUTURE OUTLOOK

The country has rich potential of iron ore, both in terms of quantity and quality. It can easily meet, both the domestic demand and the export market. India is among the leading exporters of iron ore in the world. There is a tremendous scope

for using the mined ore within the country for augmenting steel production and export steel in lieu of iron ore on a large scale. India is well poised with brownfield expansion of heavy steel plants, backward integration re-rollers, forward integration of DRI or pig iron producers and emergence of a few greenfield projects. With necessary measures, this sector would gear up to provide employment and boost the economic development of the country.

The all-India resources of iron ore placed at 28.5 billion tonnes. Further, in view of the drilling technology constraints in the past, the drilling in iron ore leasing areas was confined to 60-80 m. Recent experience has shown that in many of the iron ore leasing areas, the depth continuity is beyond 80 m. This will also result in augmentation of resources. Further, BIF which was hitherto considered as waste, is now important sources of iron ore with adoption of suitable processing technology. Apart from this, many of the iron ore bearing areas have not been explored in detail. Detailed exploration in such areas will further augment the resources. In view of this, it is felt that iron ore resources which are presently at 28.5 billion tonnes, is expected to increase after detailed exploration and there will be no problem in meeting the future demand of iron ore.

R&D efforts need to be intensified for developing new technologies to make the Indian steel industry competitive internationally as well as utilise more iron ore fines in the production of steel as a measure of conservation of iron ore resources.