Indian Minerals Yearbook 2022

(Part- III : Mineral Reviews)

61st Edition

IRON ORE

(ADVANCE RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

Indira Bhavan, Civil Lines,
NAGPUR – 440 001

PHONE/FAX NO. (0712) 2565471
PBX : (0712) 2562649, 2560544, 2560648
E-MAIL : cme@ibm.gov.in
Website: www.ibm.gov.in

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16 Iron Ore

Iron & steel is the driving force behind industrial development in any country. The vitality of the Iron & Steel Industry largely influences a country's economic status. The mining of iron ore, an essential raw material for Iron & Steel Industry is arguably of prime importance among all mining activities undertaken by any country. With the total resources of over 35.284 billion tonnes of haematite (Fe_2O_3) and magnetite (Fe_3O_4), India is one of the leading producers of iron ore in the world.

RESERVES/RESOURCES

Haematite and magnetite are the most important iron ores in India. About 79% haematite ore deposits are found in the Eastern Sector (Assam, Bihar, Chhattisgarh, Jharkhand, Odisha & Uttar Pradesh) while about 93% magnetite ore deposits occur in Southern Sector (Andhra Pradesh, Goa, Karnataka, Kerala & Tamil Nadu). Karnataka alone contributes 72% of magnetite deposit in India. Of these, haematite is considered to be superior because of its higher grade. Indian deposits of haematite 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 NMI database based on UNFC system, the total reserves/resources of haematite as on 1.4.2020 have been estimated at 24,057 million tonnes of which 6,209 million tonnes (25.80%) are under 'Reserves' category and the balance 17,848 million tonnes (74.20%) are under 'Remaining Resources' category. By grades, Lumps constitute about 45% followed by Lumps with Fines (27%), Fines (13%), and the remaining 15% are Black Iron ore, Beneficiable grade, Others, Unclassified, Not-known and Lumps & fines & blue dust unclassified grade. Major reserves/resources of haematite are located in Odisha (9,409 million tonnes or 39%), Jharkhand (4,710 million tonnes or 20%), Chhattisgarh (4,592 million tonnes or 19%), Karnataka (2,835 million tonnes or 12%) and Goa (1,197 million tonnes or 5%). The balance 5% resources of haematite are spread in Andhra Pradesh, Assam, Bihar, Madhya Pradesh, Maharashtra, Meghalaya, Rajasthan, Telangana 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. As per NMI database based on UNFC system, the total reserves/resources of magnetite as on 1.4.2020 have been estimated at 11,227 million tonnes of which 'Reserves' constitute 202 million tonnes while 11,024 million tonnes are placed under 'Remaining Resources'. Classification on the basis of grades shows that 20% resources are of Metallurgical grade while 80% resources belong to grades that are categorised as Unclassified, Not-known and Coal Washery. The resources of Others and Foundry grades constitute meagre proportions. India's 96.70% magnetite reserves/resources are located in five States, namely, Karnataka (7,802 million tonnes or 69.50%) followed by Andhra Pradesh (1,472 million tonnes or 13.10%), Rajasthan (794 million tonnes or 7.10%), Tamil Nadu (528 million tonnes or 4.70%) and Goa (266 million tonnes or 2.30%). Assam, Bihar, Chhattisgarh, Jharkhand, Kerala, Maharashtra, Meghalaya, Nagaland, Odisha and Telangana together account for the remaining 3.30% resources (Table-2).

EXPLORATION & DEVELOPMENT

The Exploration & Development details, if any, are covered in the Review "Exploration & Development" in Volume-I of Indian Minerals Yearbook titled "General Reviews".

PRODUCTION

The production of iron ore constituting lumps, fines and concentrates was at 253.97 million tonnes in the year 2021-22, showing an increase of about 23.86% as compared to that in the preceding year.

There were 245 reporting mines in 2021-22 as against 280 in the previous year. Among them, 43 mines were in the Public Sector and 202 in Private Sector. Besides, production of iron ore was reported as associated mineral by 10 mines in 2021-22 which is one more than that of the year 2020-21. The contribution of Public Sector

to the total production was about 39.30% as against about 37.00% in the preceding year. The remaining 60.70% of the production in 2021-22 was from Private Sector. Among 43 iron ore mines in Public Sector, 22 iron ore mines each producing more than one million tonnes annually accounted for about 97.59% of the total output in Public Sector during 2021-22. Out of 202 iron ore mines and 10 associated mines in Private Sector, 39 iron ore mines each producing more than one million tonnes annually accounted for about 84.34% of the total output of Private Sector during the year. Thus, 61 iron ore mines, each producing more than one million tonnes of iron ore annually, contributed about 89.55% of the total output in 2021-22. The captive mines reported production of 96.34 million tonnes comprising about 37.94% of total production and non captive mines reported production of 157.63 million tonnes i.e. about 62.06% during 2021-22.

Gradewise analysis of the current year's output reveals that, out of total output of 253.97 million tonnes, iron ore lumps constituted 72.86 million tonnes (i.e., about 28.69%), fines constituted 179.72 million tonnes (i.e., about 70.76%) and concentrates constituted 1.39 million tonnes (i.e., about 0.55%).

Among the States, Odisha recorded the highest production of 136.67 million tonnes, i.e., about 53.82% of the country's production in 2021-22. Chhattisgarh was at the second place with a production of 41.31 million tonnes, i.e., about 16.27% of the total production followed by Karnataka with a production of 40.33 million tonnes, i.e., about 15.88% , Jharkhand 24.72 million tonnes, i.e., about 9.74% of the country's production. The remaining 10.90 million tonnes, i.e., 4.29% production was reported from Andhra Pradesh, Madhya Pradesh, Maharashtra and Rajasthan.(Table 3 to 6)

STOCKS AT MINE-HEAD

The mine-head closing stocks of iron ore for the year 2021-22 were 119.19 million tonnes as compared to 121.17 million tonnes in 2020-21 (Tables 7(A) & 7(B)).

EMPLOYMENT

The average daily employment of labour was 47,063 during 2021-22 as against 42,422 in the preceding year.

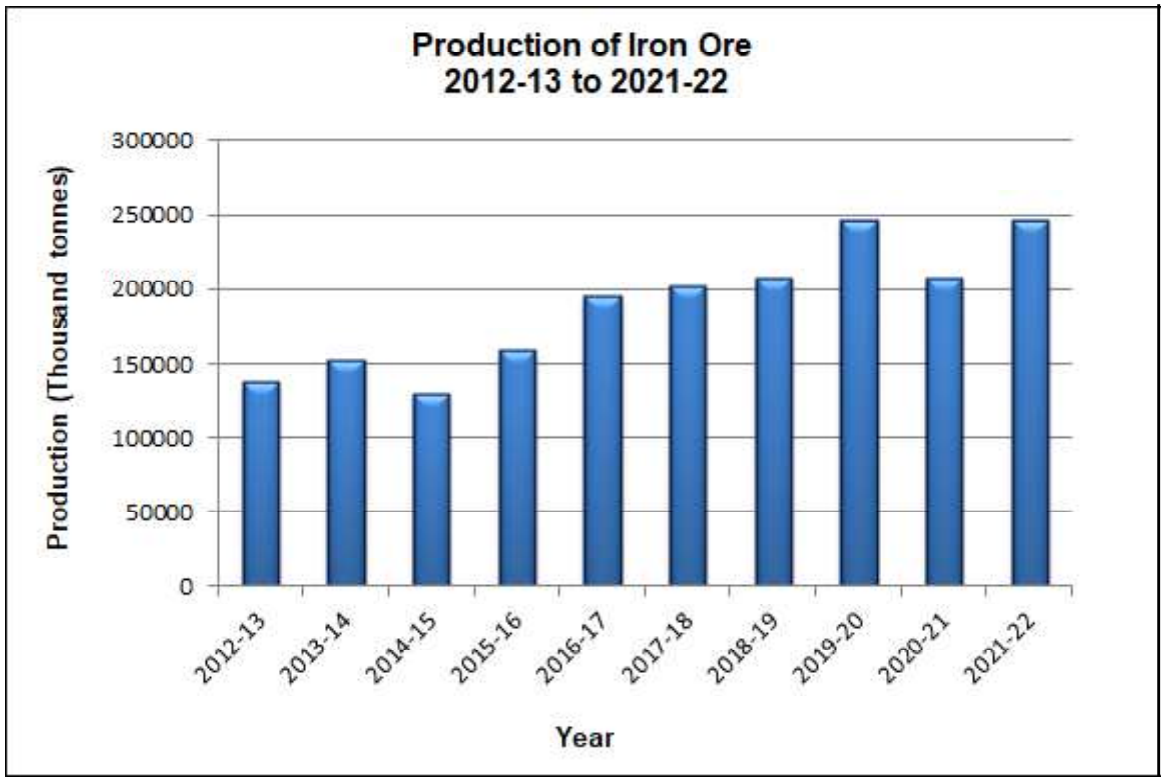


Table – 1 : Reserves/Resources of Iron Ore (Haematite) as on 1.4.2020
(By Grades/States)

(In '000 tonnes)

Grade/State	Reserves				Remaining Resources								
	Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	Total Resources (A+B)
		STD121	STD122			STD221	STD222						
All India : Total	**4559856**	**508158**	**1141020**	**6209034**	**3181005**	**2404790**	**2005363**	**1010484**	**1805532**	**4827512**	**2614185**	**17848870**	**24057905**
By Grades													
Lump, high grade	773270	7710	51205	832185	457627	114235	150606	40724	31400	141760	3742	940095	1772279
Lump, medium grade	1066104	59274	307207	1432585	1140155	335227	594409	243736	601353	1180044	93864	4188788	5621372
Lump, low grade	594586	8710	83034	686331	309262	200290	67277	222298	316657	1025039	247723	2388547	3074877
Lump, unclassified grade	194	-	16	210	54880	28	7782	16768	31742	112248	22800	246248	246459
Fines, high grade	146830	-	-	146830	7222	1592	4849	44930	8451	147	-	67192	214022
Fines, medium grade	76699	9401	61729	147829	38835	235664	46988	170724	268811	442248	932	1204201	1352029
Fines, low grade	122319	7765	18216	148301	224999	190987	98102	21053	161961	505004	6212	1208318	1356619
Fines, unclassified grade	300	190	-	490	343	341	-	8734	12610	78658	15200	115885	116375
Lumps & fines high grade	244340	117770	109568	471678	57490	92283	44972	16730	602	154257	112375	478709	950387
Lumps & fines medium grade	675056	92861	248507	1016424	175016	327566	73775	92791	28418	203097	240896	1141559	2157983
Lumps & fines low grade	494490	7347	196706	698544	400738	721773	660343	50884	53254	459916	88688	2435597	3134141
Lumps & fines unclassified	120995	51430	15719	188144	70934	17172	24675	1061	6543	29174	4101	153661	341805
Black iron ore	-	-	-	-	7017	3014	1355	-	1059	6661	-	19106	19106
Beneficiable grade	98514	139886	32121	270521	144495	114029	164994	72012	280639	242950	99318	1118438	1388959
Others	20546	-	3360	23905	15825	8913	16996	-	332	10774	745	53585	77490
Unclassified	68922	3824	13393	86138	57610	19631	39663	5495	1548	53912	152046	329906	416044
Not-known	1330	-	239	1569	621	20000	2992	-	151	180168	1524850	1728782	1730351
Lumps & fines & blue dust low grade	-	-	-	-	-	-	410	-	-	1437	0	1847	1847
Lumps & fines & blue dust unclassified grade	55361	1990	-	57351	17935	2046	5175	2543	-	16	692	28408	85759

(contd)

Table-1(concld) (In '000 tonnes)

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						
By States													
Andhra Pradesh	32893	-	11851	44744	42461	68382	66330	377	5863	144374	23085	350872	395616
Assam	-	-	-	-	-	-	-	-	8600	22290	-	30890	30890
Bihar	-	-	-	-	-	-	-	-	-	55	-	55	55
Chhattisgarh	1289443	99927	204363	1593732	348648	17215	46166	171548	552653	993652	868497	2998379	4592111
Goa	96558	7666	13012	117235	435300	255162	182675	22126	12727	166631	5701	1080322	1197557
Jharkhand	388078	16760	129839	534677	324634	902980	814308	101700	122673	617586	1291588	4175469	4710146
Karnataka	897256	39779	106177	1043212	330334	46621	84816	592180	62882	504234	171714	1792781	2835992
Madhya Pradesh	24363	11326	18440	54129	30076	15080	29885	12613	3993	151523	59700	302870	356999
Maharashtra	9464	2124	3653	15241	1672	6632	9191	81116	95545	59673	32474	286304	301544
Meghalaya	-	-	-	-	-	-	-	-	-	225	-	225	225
Odisha	1817247	328296	653206	2798749	1662944	1068654	770861	28824	925717	2019410	134173	6610582	9409331
Rajasthan	4555	2280	479	7314	3775	3962	1132	-	11510	7776	13	28166	35480
Telangana	-	-	-	-	1162	102	-	-	3370	73754	27240	105627	105627
Uttar Pradesh	-	-	-	-	-	20000	-	-	-	66330	-	86330	86330

Figures rounded off

Table – 2 : Reserves/Resources of Iron Ore (Magnetite) as on 1.4.2020
(By Grades/States)

(In '000 tonnes)

Grade/State	Reserves				Remaining Resources								
	Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	Total Resources (A+B)
		STD121	STD122			STD221	STD222						
All India : Total	**71930**	**385**	**130508**	**202823**	**307652**	**16082**	**72127**	**1513168**	**2036982**	**6383274**	**695507**	**11024791**	**11227614**
By Grades													
Metallurgical	231	65	19	315	165948	24	21583	690596	391192	968646	255	2238244	2238559
Coal washery	35972	-	82706	-118678	-	518	1981	411	318	41545	79596	124368	243045
Foundry	-	-	-	-	330	125	-	-	-	381	-	836	836
Beneficiable	-	-	-	-	-	-	-	-	4016	23602	9180	36798	36798
Others	909	-	443	1351	3796	985	170	-	-	1791	-	6923	8274
Unclassified	34818	320	47341	82479	65421	13720	48387	822161	1641456	5066985	606428	8264559	8347038
Not-known	-	-	-	-	71978	709	6	-	-	280324	48	353064	353064
By States													
Andhra Pradesh	-	-	-	-	114210	-	-	13800	1266666	68527	9180	1472383	1472383
Assam	-	-	-	-	-	-	-	-	-	15380	-	15380	15380
Bihar	-	-	-	-	-	-	-	-	48850	589	-	49439	49439
Chhattisgarh	29319	-	46557	75876	12263	-	17782	-	-	-	-	30045	105921
Goa	4364	-	626	4990	59509	14516	33512	-	-	151811	1997	261345	266336
Jharkhand	-	-	-	-	-	518	1986	411	3948	3722	82	10667	10667
Karnataka	133	185	-	318	120131	-	18375	1498957	479372	5345018	340000	7801853	7802171
Kerala	-	-	-	-	-	-	-	-	59912	23523	-	83435	83435
Maharashtra	481	65	32	578	329	24	267	-	-	590	-	1210	1788
Meghalaya	-	-	-	-	-	-	-	-	-	3380	-	3380	3380
Nagaland	-	-	-	-	-	-	-	-	5280	-	-	5280	5280
Odisha	-	-	-	-	79	-	120	-	-	43	-	242	242
Rajasthan	376631	136	83294	121060	1131	1023	85	-	3566	588463	79595	673866	794926
Tamil Nadu	-	-	-	-	-	-	-	-	169388	110728	248785	528901	528901
Telangana	-	-	-	-	-	-	-	-	-	71500	15866	87366	87366

Figures rounded off

Table - 3 :Principal Producers of Iron ore 2021-22

Name & address of producer	Location of mine	
	State	District
National Mineral Development Corporation Ltd 10-3-311/A, Khanij Bhavan, Castle Hills, Masab Tank, Hyderabad –500 028	Chhattisgarh Karnataka	Dantewada Ballari
Steel Authority of India Ltd Ispat Bhavan, Lodhi Road, New Delhi – 110 003	Chhattisgarh Jharkhand Odisha	Durg Singhbhum (West) Keonjhar, Sundargarh
Tata Steel Ltd, Bombay House, 24, Homi Mody Street, Fort, Mumbai – 440 001, Maharashtra	Jharkhand Odisha	Singhbhum (West) Keonjhar
JSW Steel Ltd, Jsw Centre Bandra Kurla Complex, Bandra (East) - Mumbai-400 051, Maharashtra	Karnataka	Ballari
Rungta Sons (P) Ltd, 8A Express Tower, 42 A-Shakespeare Sarani, Kolkata – 700 017, West Bengal	Jharkhand Odisha	Singhbhum (West) Keonjhar
Odisha Mining Corporation Ltd, OMC House, Unit-5, P.B. No.34 Distt Khurda, Bhubaneswar-751 001, Odisha	Odisha	Keonjhar Sundargarh

(contd)

Table - 3 (Concld)

Name & address of producer	Location of mine	
	State	District
Sarda Mines (P) Ltd, Room No. 64, 6th Floor, Circular Court, 8-AJC Bose Road, Kolkata- 700 017, West Bengal	Odisha	Keonjhar
Essel Mining & Industries Ltd Industry House, 18th Floor, 10 Camac street, Kolkata-700 017 West Bengal.	Odisha	Sundargarh Keonjhar
Vedanta Ltd Sesa Ghor, EDC complex, Patto, Panaji, Tisavadi-403 001 Goa	Karnataka	Chitradurga
ArcelorMittal India Pvt. Ltd Office No.126 101-104, GCP Business Centre Opp. Memnagar Fire Station, Vijay Cross Road, Memnagar, Ahmedabad-380014 Gujarat	Odisha	Keonjhar
Mysore Minerals Limited, A Block, 5th floor, Santhinagar, Bengaluru – 560 027, Karnataka	Karnataka	Ballari
Jindal Steel & Power Ltd O.P. Jindal Marg, Delhi Road, Hissar - 125 005 Haryana	Odisha	Sundargarh

(contd)

Table - 3 (Conted)

Name & address of producer	Location of mine	
	State	District
Serajuddin & Co, P-16, Bentink Street, Kolkata- 700069 West Bengal	Odisha	Keonjhar
Sri Kumaraswamy Minerals Exporters, No. 24, 2nd Link Road, Parvathi Nagar, Ballari- 583102, Karnataka	Karnataka	Ballari
Geetarani Mohanty, 380, Bomikhal, Cuttack- Puri Road, Bhubaneswar- 751010, Odisha	Odisha	Sundargarh
Tata Steel Long Products Ltd., (West) Mangal Kalash, 2A, Shakespear Sarani, Kolkata- 700017	Jharkhand	Singhbhum

(contd)

Table - 3 (Concld)

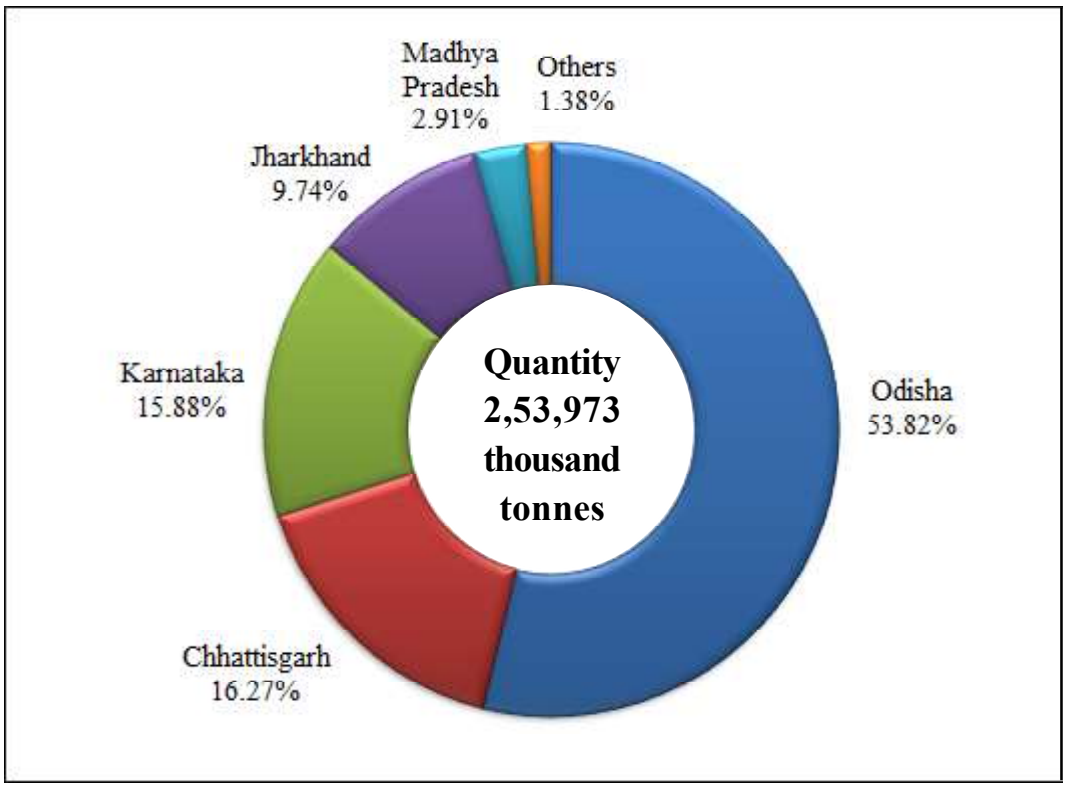
Name & address of producer	Location of mine	
	State	District
Narbheram Power and Steel Pvt Ltd., Avani Signature91a/1, 6th Floor, Park Street, Kolkata- 700016 West Bengal	Odisha	Keonjhar
Godawari Power & Ispat Ltd., Plot No. 428/1, Phase-1, Industrial Area, Siltara Dharsiwa, Raipur- 493111, Chhattisgarh	Chhattisgarh	Rajnandgaon
Arcelor Mittal Nippon Steel India Li., 27 km, Surat Hazira Roadhazira, Chouryasi, Surat- 394270 Gujarat	Odisha	Sundargarh
Prabodh Mohanty, Weighbridge Road, Post Box No. 21, Barbil- 758035 Odisha	Odisha	Sundargarh

Table – 4 : Production of Iron Ore, 2019-20 to 2021-22
(By States)

(Quantity in '000 tonnes; Value in ₹ '000)

States		2019-20		2020-21		2021-22 (P)	
		Quantity	Value	Quantity	Value	Quantity	Value
India	**Total**	**244083**	**496430578**	**205041**	**527292469**	**253973**	**963813280**
	Lumps	76012	195781171	61917	198763643	72864	361924390
	Fines	166889	296322689	141934	323013422	179716	594861827
	Concentrates	1182	4326718	1190	5515404	1393	7027063
Andhra Pradesh	**Total**	**825**	**613393**	**349**	**260233**	**312**	**230684**
	Lumps	508	424030	213	181601	189	159196
	Fines	317	189363	136	78632	123	71488
Chhattisgarh	**Total**	**34728**	**99153323**	**36839**	**132201316**	**41313**	**218099187**
	Lumps	12191	38230890	12710	52033594	14545	88248035
	Fines	22537	60922433	24129	80167722	26768	129851152
Goa	**Total**	**-**	**-**	**1003**	**897737**	**-**	**-**
	Lumps	-	-	331	333817	-	-
	Fines	-	-	672	563920	-	-
	Concentrates	-	-	-	-	-	-
Jharkhand	**Total**	**25015**	**29411760**	**21434**	**28520399**	**24728**	**55467888**
	Lumps	6954	9627055	4827	7279890	5680	13943382
	Fines	18061	19784705	16607	21240509	19048	41524506
Karnataka	**Total**	**31392**	**67326043**	**34500**	**94390860**	**40332**	**158769382**
	Lumps	9248	25077852	10108	36892352	11707	57861464
	Fines	22144	42248191	24392	57498508	28625	100907918
Madhya Pradesh	**Total**	**3343**	**1729068**	**4094**	**2146870**	**7399**	**4667940**
	Lumps	1467	687760	859	463231	1197	778188
	Fines	1876	1041308	3235	1683140	6202	3889752
	Concentrates	-	-	-	499	-	
Maharashtra	**Total**	**1131**	**1340244**	**1249**	**1732866**	**1958**	**6471874**
	Lumps	93	197711	113	253928	751	4237390
	Fines	1038	1142533	1136	1478938	1207	2234484
Odisha	**Total**	**146637**	**293179734**	**104485**	**262035370**	**136696**	**514531737**
	Lumps	45363	121484813	32699	101296238	38660	196606783
	Fines	100916	170994093	71626	160300893	97740	316379535
	Concentrates	358	700828	160	438239	296	1545419
Rajasthan	**Total**	**1012**	**3677013**	**1088**	**5106818**	**1235**	**5574588**
	Lumps	188	51060	57	28992	135	89952
	Fines	++	63	1	1160	3	2992
	Concentrates	824	3625890	1030	5076666	1097	5481644
Telangana	**Total**	**-**	**-**	**-**	**-**	**-**	**-**
	Lumps	-	-	-	-	-	-
	Fines	-	-	-	-	-	-

Quantity of Iron Ore Production in Different States, 2021-22



Value of Iron Ore Production in different States, 2021-22

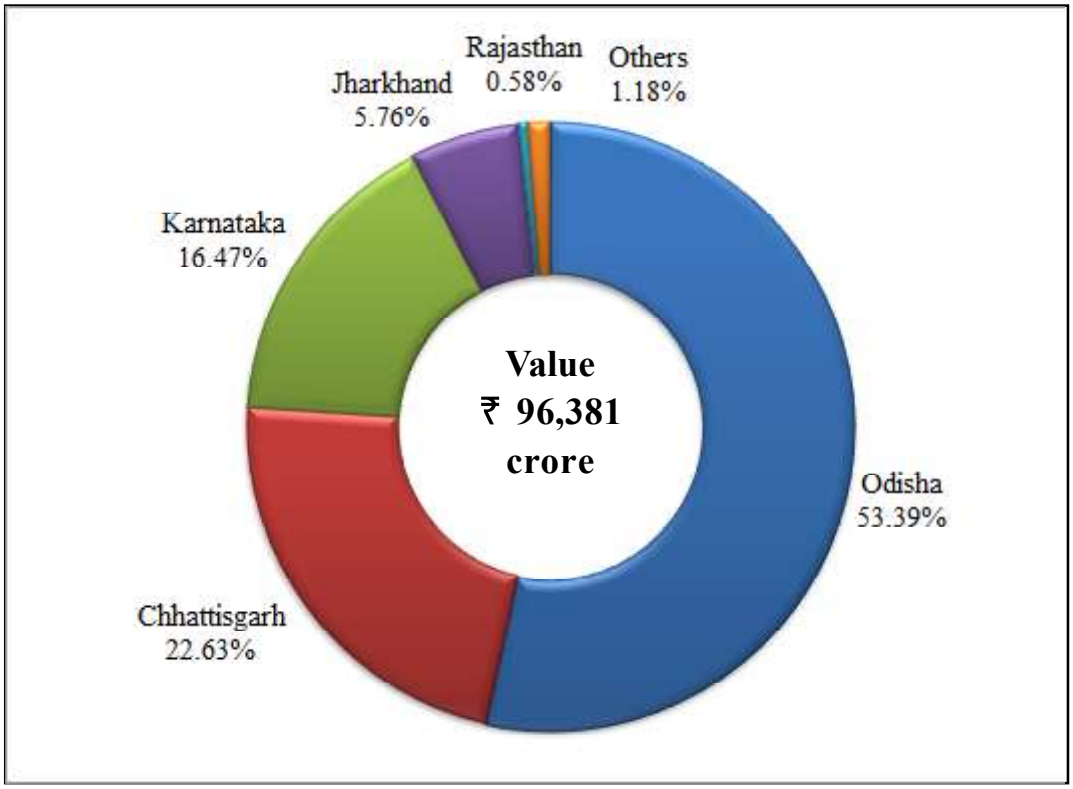


Table – 5 (A) : Production of Iron Ore, 2021-22 (P)

(Quantity in '000 tonnes; Value in ₹'000)

Sector/ State/ District	No. of mines	Lumps								Fines								Concentrates		Total	
		Below 55% Fe	55%- below 58% Fe	58%- below 60% Fe	60%- below 62% Fe	62%- below 65% Fe	65% Fe & above	Total		Below 55% Fe	55%- below 58% Fe	58%- below 60% Fe	60%- below 62% Fe	62%- below 65% Fe	65% Fe & above	Total					
								Qty	Value							Qty	Value	Qty	Value	Qty	Value
India	**245(10)**	**5902**	**2820**	**9215**	**10707**	**26985**	**17235**	**72864**	**361924390**	**19343**	**25007**	**19490**	**44118**	**48140**	**23618**	**179716**	**594861827**	**1393**	**7027063**	**253973**	**963813280**
Public Sector	43	121	268	1053	5113	18263	9838	34656	200526074	282	2670	4191	27182	26242	4586	65153	272667286	-	-	99809	473193360
Private Sector	202(10)	5781	2552	8162	5594	8722	7397	38208	161398316	19061	22337	15299	16936	21898	19032	114563	322194541	1393	7027063	154164	490619920
Andhra Pradesh	**13**	**189**	-	-	-	-	-	**189**	**159196**	**123**	-	-	-	-	-	**123**	**71488**	-	-	**312**	**230684**
Anantapur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cuddapah	4	160	-	-	-	-	-	160	132962	107	-	-	-	-	-	107	60898	-	-	267	193860
Krishna	1	-	-	-	-	-	-	-	-	++	-	-	-	-	-	++	23	-	-	++	23
Kurnool	7	29	-	-	-	-	-	29	26234	16	-	-	-	-	-	16	10567	-	-	45	36801
Nellore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prakasam	1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chhattisgarh	**21**	**352**	**255**	**279**	**725**	**3393**	**9541**	**14545**	**88248035**	**1174**	**1453**	**780**	**4183**	**14044**	**5134**	**26768**	**129851152**	-	-	**41313**	**218099187**
Dantewara	7	-	-	13	-	181	9539	9733	80274985	4	6	119	1444	12895	4405	18873	115887818	-	-	28606	196162803
Durg	4	21	85	113	614	3110	-	3943	6409250	27	420	104	2263	1148	-	3962	6472702	-	-	7905	12881952
Kanker	6	113	105	94	107	102	-	521	822059	1063	964	533	468	-	729	3757	7109529	-	-	4278	7931588
Narayanpur	2	-	-	42	-	-	2	44	99274	14	10	-	-	-	-	24	42966	-	-	68	142240
Rajnandgaon	2	218	65	17	4	-	-	304	642467	66	53	24	8	1	-	152	338137	-	-	456	980604
Goa	**27**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North Goa	9*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Goa	18*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jharkhand	**16**	**35**	**87**	**897**	**2264**	**849**	**1548**	**5680**	**13943382**	**77**	**788**	**1678**	**5631**	**2365**	**8509**	**19048**	**41524506**	-	-	**24728**	**55467888**
Singhbhum (West)	16	35	87	897	2264	849	1548	5680	13943382	77	788	1678	5631	2365	8509	19048	41524506	-	-	24728	55467888
Karnataka	**56(1)**	**2351**	**794**	**2247**	**2519**	**3377**	**419**	**11707**	**57861464**	**4895**	**7830**	**5849**	**3805**	**5285**	**961**	**28625**	**100907918**	-	-	**40332**	**158769382**
Bagalkot	2	161	-	-	-	-	-	161	513978	106	-	-	-	-	-	106	225879	-	-	267	739857
Bellary	48	2021	699	1581	2199	3206	419	10125	49325500	4162	3055	4702	3800	5285	961	21965	81277171	-	-	32090	130602671
Chitradurga	5	169	87	666	320	171	-	1413	7983648	614	4775	1147	5	-	-	6541	19384745	-	-	7954	27368393
Tumkur	1(1)	-	8	-	-	-	-	8	38338	13	-	-	-	-	-	13	20123	-	-	21	58461

(contd)

Table - 5 (A) : (concld)

Sector/ State/ District	No. of mines	Lumps								Fines								Concentrates		Total	
		Below 55% Fe	55%- below 58% Fe	58%- below 60% Fe	60%- below 62% Fe	62%- below 65% Fe	65% Fe & above	Total		Below 55% Fe	55%- below 58% Fe	58%- below 60% Fe	60%- below 62% Fe	62%- below 65% Fe	65% Fe & above	Total					
								Qty	Value							Qty	Value	Qty	Value	Qty	Value
Madhya Pradesh	**23(8)**	**1192**	**5**	**-**	**-**	**-**	**-**	**1197**	**778188**	**6054**	**139**	**-**	**9**	**-**	**-**	**6202**	**3889752**	**-**	**-**	**7399**	**4667940**
Balaghat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chhatarpur	1	80	-	-	-	-	-	80	39214	22	-	-	-	-	-	22	11040	-	-	102	50254
Gwalior	1	-	-	-	-	-	-	-	-	121	-	-	-	-	-	121	60803	-	-	121	60803
Jabalpur	20(8)	1053	5	-	-	-	-	1058	666480	5888	139	-	9	-	-	6036	3799295	-	-	7094	4465775
Sagar	1	59	-	-	-	-	-	59	72494	23	-	-	-	-	-	23	18614	-	-	82	91108
Maharashtra	**11**	**65**	**54**	**54**	**23**	**555**	**-**	**751**	**4237390**	**560**	**181**	**126**	**264**	76	-	**1207**	**2234484**	**-**	**-**	**1958**	**6471874**
Chandrapur	1	10	7	6	3	-	-	26	76148	23	7	11	-	-	-	41	76900	-	-	67	153048
Gadchiroli	1	-	-	4	20	555	-	579	3810495	-	-	-	264	76	-	340	1231368	-	-	919	5041863
Gondia	3	11	-	-	-	-	-	11	20570	6	-	-	-	-	-	6	3560	-	-	17	24130
Sindhudurg	6	44	47	44	-	-	-	135	330177	531	174	115	-	-	-	820	922656	-	-	955	1252833
Odisha	**68(1)**	**1588**	**1620**	**5738**	**5176**	**18811**	**5727**	**38660**	**196606783**	**6457**	**14616**	**11057**	**30226**	**26370**	**9014**	**97740**	**316379535**	**296**	**1545419**	**136696**	**514531737**
Keonjhar	39	1106	865	2976	1660	13421	5461	25489	125614399	2921	7114	6389	19940	15365	8929	60658	183508182	-	-	86147	309122581
Mayurbhanj	3	257	209	3	9	42	8	528	2102992	1062	-	9	19	4	12	1106	1702339	-	-	1634	3805331
Sundargarh	26(1)	225	546	2759	3507	5348	258	12643	68889392	2474	7502	4659	10267	11001	73	35976	131169014	296	1545419	48915	201603825
Rajasthan	**10**	**130**	**5**	-	-	-	-	**135**	**89952**	**3**	-	-	-	-	-	**3**	**2992**	**1097**	**5481644**	**1235**	**5574588**
Bhilwara	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1097	5481644	1097	5481644
Jaipur	3	59	-	-	-	-	-	59	18221	1	-	-	-	-	-	1	826	-	-	60	19047
Jhunjhunu	3	28	-	-	-	-	-	28	34521	-	-	-	-	-	-	-	-	-	-	28	34521
Karauli	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sikar	2	43	5	-	-	-	-	48	37210	2	-	-	-	-	-	2	2166	-	-	50	39376
Telangana	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-	-	-	-	-	-	-	**-**	**-**
Khammam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

++ *Negligible,* Only labour reported, ( ) : No. of mines reported as associated mineral.*

Table – 5 (B) : Production of Iron Ore, 2020-21
(By Sectors/States/Districts/Grades)

(Quantity in '000 tonnes; Value in ₹'000)

Sector/ State/ District	No. of mines	Lumps								Fines								Concentrates		Total	
		Below 55% Fe	55%- below 58% Fe	58%- below 60% Fe	60%- below 62% Fe	62%- below 65% Fe	65% Fe & above	Total Qty	Total Value	Below 55% Fe	55%- below 58% Fe	58%- below 60% Fe	60%- below 62% Fe	62%- below 65% Fe	65% Fe & above	Total Qty	Total Value	Qty	Value	Qty	Value
India	280(9)	3736	1981	6062	9278	24757	16103	61917	198763643	11453	17969	12899	30149	48813	20651	141934	323013422	1190	5515404	205041	527292469
Public Sector	43	82	154	327	3265	13696	9089	26613	95841017	209	1114	1769	17089	22484	6606	49271	127727896	-	-	75884	223568913
Private Sector	237(9)	3654	1827	5735	6013	11061	7014	35304	102922626	11244	16855	11130	13060	26329	14045	92663	195285526	1190	5515404	129157	303723556
Andhra Pradesh	**14**	**206**	**7**	-	-	-	-	**213**	**181601**	**136**	-	-	-	-	-	**136**	**78632**	-	-	**349**	**260233**
Anantapur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cuddapah	3	200	7	-	-	-	-	207	176226	134	-	-	-	-	-	134	77439	-	-	341	253665
Krishna	1	-	-	-	-	-	-	-	-	++	-	-	-	-	-	++	252	-	-	++	252
Kurnool	9	6	-	-	-	-	-	6	5375	2	-	-	-	-	-	2	941	-	-	8	6316
Nellore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prakasam	1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chhattisgarh	**21**	**185**	**378**	**157**	**707**	**2581**	**8702**	**12710**	**52033594**	**744**	**650**	**716**	**3808**	**11320**	**6891**	**24129**	**80167722**	-	-	**36839**	**132201316**
Dantewara	7	-	-	24	4	21	8667	8716	46782648	-	20	119	1114	9805	6101	17159	70717226	-	-	25875	117499874
Durg	4	29	61	62	565	2501	34	3252	4356798	23	35	-	2115	1515	104	3792	5045162	-	-	7044	9401960
Kanker	6	96	252	53	136	59	1	597	682315	696	530	576	573	-	686	3061	4232182	-	-	3658	4914497
Narayanpur	2	-	-	-	-	-	-	-	196	-	-	-	-	-	-	-	-	-	-	-	196
Rajnandgaon	2	60	65	18	2	-	-	145	211637	25	65	21	6	-	-	117	173152	-	-	262	384789
Goa	**40**	**280**	**47**	**2**	**1**	**1**	-	**331**	**333817**	**537**	**99**	**33**	**1**	**2**	-	**672**	**563920**	-	-	**1003**	**897737**
North Goa	14	160	7	2	1	1	-	171	132452	320	29	33	1	2	-	385	315956	-	-	556	448408
South Goa	26	120	40	-	-	-	-	160	201365	217	70	-	-	-	-	287	247964	-	-	447	449329
Jharkhand	**17**	**7**	**5**	**466**	**1560**	**2109**	**680**	**4827**	**7279890**	**107**	**503**	**652**	**5798**	**6888**	**2659**	**16607**	**21240509**	-	-	**21434**	**28520399**
Singhbhum (West)	17	7	5	466	1560	2109	680	4827	7279890	107	503	652	5798	6888	2659	16607	21240509	-	-	21434	28520399
Karnataka	**65**	**1397**	**918**	**1708**	**1460**	**4314**	**311**	**10108**	**36892352**	**3292**	**5030**	**6452**	**3244**	**5667**	**707**	**24392**	**57498508**	-	-	**34500**	**94390860**
Bagalkot	3	99	-	-	-	-	-	99	258920	16	-	-	-	-	-	16	16317	-	-	115	275237
Bellary	56	1208	794	1076	1143	4063	311	8595	30054199	2912	2673	3493	3244	5667	707	18696	46949052	-	-	27291	77003251
Chitradurga	6	90	124	632	317	251	-	1414	6579233	364	2357	2959	-	-	-	5680	10533139	-	-	7094	17112372
Tumkur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(contd)

Table - 5 (B) : (concld)

Sector/ State/ District	No. of mines	Lumps								Fines								Concentrates		Total	
		Below 55% Fe	55%- below 58% Fe	58%- below 60% Fe	60%- below 62% Fe	62%- below 65% Fe	65% Fe & above	Total Qty	Total Value	Below 55% Fe	55%- below 58% Fe	58%- below 60% Fe	60%- below 62% Fe	62%- below 65% Fe	65% Fe & above	Total Qty	Total Value	Qty	Value	Qty	Value
Madhya Pradesh	**21(8)**	**841**	**18**	**-**	-	-	-	**859**	**463231**	**3125**	**110**	**-**	-	-	-	**3235**	**1683140**	**++**	**499**	**4094**	**2146870**
Chhatarpur	1	61	15	-	-	-	-	76	34250	18	-	-	-	-	-	18	8033	-	-	94	42283
Jabalpur	18(8)	772	-	-	-	-	-	772	417143	2864	110	-	-	-	-	2974	1571965	++	499	3746	1989607
Gwalior	1	-	-	-	-	-	-	-	-	232	-	-	-	-	-	232	92969	-	-	232	92969
Sagar	1	8	3	-	-	-	-	11	11838	11	-	-	-	-	-	11	10173	-	-	22	22011
Maharashtra	**11**	**52**	**17**	**44**	**-**	**-**	**-**	**113**	**253928**	**808**	**91**	**237**	-	-	-	**1136**	**1478938**	-	-	**1249**	**1732866**
Chandrapur	1	-	-	5	-	-	-	5	4587	18	2	3	-	-	-	23	21103	-	-	28	25690
Gadchiroli	1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gondia	3	10	-	-	-	-	-	10	19551	12	-	-	-	-	-	12	6077	-	-	22	25628
Kolhapur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sindhudurg	6	42	17	39	-	-	-	98	229790	778	89	234	-	-	-	1101	1451758	-	-	1199	1681548
Odisha	**82(1)**	**714**	**588**	**3685**	**5550**	**15752**	**6410**	**32699**	**101296238**	**2703**	**11486**	**4809**	**17298**	**24936**	**10394**	**71626**	**160300893**	**160**	**438239**	**104485**	**262035370**
Keonjhar	48	459	207	1608	2116	9712	6103	20205	53656219	693	3458	3828	11956	14603	10390	44928	87436831	-	-	65133	141093050
Mayurbhanj	5	40	29	193	-	64	3	329	1078774	290	9	-	1	27	-	327	309767	-	-	656	1388541
Sundargarh	29(1)	215	352	1884	3434	5976	304	12165	46561245	1720	8019	981	5341	10306	4	26371	72554295	160	438239	38696	119553779
Rajasthan	**9**	**54**	3	-	-	-	**-**	**57**	**28992**	**1**	**-**	**-**	**-**	**-**	**-**	**1**	**1160**	**1030**	**5076666**	**1088**	**5106818**
Bhilwara	2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1030	5076666	1030	5076666
Jaipur	3	9	-	-	-	-	-	9	2746	-	-	-	-	-	-	-	-	-	-	9	2746
Jhunjhunu	1	11	-	-	-	-	-	11	5616	-	-	-	-	-	-	-	-	-	-	11	5616
Karauli	1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sikar	2	34	3	-	-	-	-	37	20630	1	-	-	-	-	-	1	1160	-	-	38	21790
Telangana	**-**	-	-	-	-	-	-	-	-	**-**	**-**	-	-	-	-	**-**	**-**	-	-	**-**	**-**
Khammam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Warangal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

++ Negligible, Only labour reported, ( ) : No. of mines reported as associated mineral.*

Table – 6 : Production of Iron Ore, 2020-21 and 2021-22 (P)
(By Frequency Groups)

Production Group (In tonnes)	No. of mines		Production (In '000 tonnes)		Percentage in total production		Cumulative percentage	
	2020-21	2021-22 (P)	2020-21	2021-22 (P)	2020-21	2021-22 (P)	22020-21	2021-22 (P)
Total	**280(9)**	**245(10)**	**205041**	**253973**	**100**	**100**	**-**	**-**
Up to 50,000	150(7)	109(8)	734	713	0.36	0.28	0.36	0.28
50,001 - 100,000	15	18	1089	1395	0.53	0.55	0.89	0.83
100,001 - 500,000	48(2)	38(2)	11855	9934	5.78	3.91	6.67	4.74
500,001 - 1,000,000	14	19	10040	14498	4.9	5.71	11.57	10.45
1,000,001 -1,500,000	15	16	18492	19613	9.02	7.72	20.59	18.17
1,500,001 - 2,000,000	4	7	6887	12420	3.36	4.89	23.95	23.06
2,000,001 and above	34	38	155944	195400	76.05	76.94	100	100

( ) : *No. of mines reported as associated mineral*

Table –7 (A) : Mine-head Closing Stocks of Iron Ore, 2020-21
(By States/Grades)

(In '000 tonnes)

State	Lumps							Fines							Concentrates	Total Lumps, Fines & Concentrates
	Below 55% Fe	55%-below 58% Fe	58%-below 60% Fe	60%-below 62% Fe	62%-below 65% Fe	65% Fe & above	Total	Below 55% Fe	55%-below 58% Fe	58%-below 60% Fe	60%-below 62% Fe	62%-below 65% Fe	65% Fe & above	Total	Total	
India	**7508**	**1237**	**2738**	**2466**	**6027**	**2136**	**22112**	**21498**	**45166**	**6072**	**10945**	**12302**	**2762**	**98745**	**313**	**121170**
Andhra Pradesh	481	13	-	++	-	-	**494**	1092	-	-	1	-	-	**1093**	-	**1587**
Chhattisgarh	54	33	103	7	73	670	**940**	194	65	13	734	941	1090	**3037**	-	**3977**
Goa	27	148	11	++	1	-	**187**	221	62	++	++	++	-	**283**	6	**476**
Jharkhand	351	408	132	270	257	151	**1569**	1342	36962	862	1010	1852	119	**42147**	-	**43716**
Karnataka	4580	273	586	331	991	100	**6861**	1950	875	898	591	951	37	**5302**	-	**12163**
Madhya Pradesh	845	6	10	17	-	-	**878**	2777	10	++	-	-	-	**2787**	++	**3665**
Maharashtra	56	5	10	1	++	-	**72**	367	62	8	-	-	-	**437**	-	**509**
Odisha	906	351	1886	1840	4705	1215	**10903**	13542	7130	4291	8609	8558	1516	**43646**	297	**54846**
Rajasthan	208	++	-	-	-	-	**208**	13	-	-	-	-	-	**13**	10	**231**
Telangana	++	-	-	-	-	-	++	-	-	-	-	-	-	-	-	++

++ *Negligible*

Table – 7 (B) : Mine-head Closing Stocks of Iron Ore, 2021-22 (P)
(By States/Grades)

(In '000 tonnes)

State	Lumps							Fines							Concentrates	Total Lumps, Fines & Concentrates
	Below 55% Fe	55%-below 58% Fe	58%-below 60% Fe	60%-below 62% Fe	62%-below 65% Fe	65%-Fe & above	Total	Below 55% Fe	55%-below 58% Fe	58%-below 60% Fe	60%-below 62% Fe	62%-below 65% Fe	65% Fe & above	Total	Total	
India	**8406**	**1737**	**4795**	**3463**	**7124**	**2225**	**27750**	**17802**	**41885**	**4725**	**12665**	**12534**	**1741**	**91352**	**86**	**119188**
Andhra Pradesh	487	6	-	++	-	-	**493**	1102	-	-	1	-	-	**1103**	-	**1596**
Chhattisgarh	3	27	152	14	132	643	**971**	151	288	19	366	1619	815	**3258**	-	**4229**
Goa	27	148	11	++	1	-	**187**	216	62	++	++	++	-	**278**	5	**470**
Jharkhand	358	439	118	230	276	85	**1506**	1337	37560	1323	912	1761	126	**43019**	-	**44525**
Karnataka	5201	366	571	557	931	201	**7827**	2252	734	691	701	1160	113	**5651**	-	**13478**
Madhya Pradesh	632	25	10	17	-	-	**684**	3051	22	4	1	-	-	**3078**	++	**3762**
Maharashtra	94	26	13	17	164	-	**314**	710	66	16	160	57	-	**1009**	-	**1323**
Odisha	1321	700	3920	2628	5620	1296	**15485**	8968	3153	2672	10524	7937	687	**33941**	70	**49496**
Rajasthan	283	++	-	-	-	-	**283**	15	-	-	-	-	-	**15**	11	**309**
Telangana	++	-	-	-	-	-	**++**	-	-	-	-	-	-	**-**	-	**++**

++ Negligible , # : under refrence

MINING, MARKETING & TRANSPORT

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

The method of mining and deployment of machinery vary from place to place depending upon characteristics of iron ore as per geological set up. Large mechanised mines are mostly in the Public Sector. Manual and semi-mechanised mines are mainly in Private Sector. Some mechanised mines in Jharkhand and Odisha are also operated by the Private Sector.

Manual Mines

Generally, these mines are confined to float ores where mining is done by digging the ore with pick axes, crow bars, 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 g 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.

Mechanised Mines

Most of the mechanised mines are captive belongings of different steel plants and have been developed to cater to specific 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.

Mines, where ore is predominantly in powdery form, hydraulic shovels with boom height of around 9 m may be used for excavation and loading. Heavy-duty Ripper-Dozers are preferred for such mining as the ores are soft. Height of the benches is restricted to 7 m for safe and efficient operations. Width of working benches is maintained at more than 15 m and bench slope is maintained at about 80°. The ore produced is transported to short distances by dumpers up to 40 tonnes capacity. For longer distances and barge loading, dumpers/trucks up to 10 tonnes capacity are used. The barges carry the ore to harbours. The ore from the barges is loaded on 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. In Private Sector, most of the captive mines are mechanised. Approximately, 90% iron ore production comes from mechanised mines. NMDC operates a couple of large mechanised iron ore mines in the country at Bailadila (Chhattisgarh) and Donimalai (Karnataka). The Company has three highly-mechanised iron ore mine complexes. Two are located in Chhattisgarh and one in Karnataka.

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 screening and beneficiation. Fines are converted into sinters for use in steel plants while pellets made from concentrates/fines are exported and also are utilised for internal consumption in domestic iron & steel industries.

ENVIRONMENTAL FACTORS

Afforestation, waste dump management, top soil management, management of sub-grade minerals, mechanical beneficiation, dust suppression, monitoring of water & 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 in iron ore mining is the disposal of tailings and other deleterious silica minerals and phosphorous.To safeguard the environment and prevent ecological degradation, thrust has been laid on green belt development, solid waste management, monitoring of liquid & 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 in crop yield and reduction in fish population in streams and navigation difficulties are the problems caused by silting. To overcome these 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. But, in early 2018, the apex court had quashed 88 mining leases for violation of mining procedures and asked the State Government of Goa to issue fresh leases instead of renewing existing ones. In February 2021, it will be three years since India's Apex Court stopped iron ore mining in Goa.

In Ballari-Hosapete area, Karnataka, dust concentration (suspended particulate matter) is the main environmental problem. 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 & 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. Iron ore pellet is a kind of agglomerated fines which has better tumbling index as compared to that of parent ore and can be used as a substitute used in blast furnaces in countries where lump ore is not available.

As per the Pellet Manufacturers Association of India the fifty-one pelletisation plants in the country about which information is available, have a total capacity of 136.7 million tonnes per annum. The JSW Steel Ltd has a manufacturing capacity of 17.20 million tonnes of pellets annually at Vijayanagar, Bellary, Karntaka. Amba River Coke Limited, a wholly owned subsidiary Company of JSW Steel, has set up a 12.0 million tpy pellet plant (Dolvi unit 1 and 2) at Dolvi. The pellets produced are primarily supplied to the Dolvi unit of the company. During the year 2021-22, all India production of pellets as per the Pellet Manufacturers Association of India was 77.27 million tonnes.

With a strong belief in prudent forward and backward integrations, JSPL established India's largest 10 MTPA Pelletisation Complex at Barbil, Odisha. The plant includes dry grinding facility that harnesses recuperation type of straight grate technology. The Company's Barbil Plant is India's largest single-location pellet manufacturing facility with 4.5 MTPA Dry Grinding Unit and a 4.5 MTPA Wet Grinding Unit. JSPL pellet plant helps to process low-cost iron ore fines as against expensive lumps, thereby handing a cost advantage. Laced with state-of-the art technology backed with proximity to iron-ore access, JSPL's Barbil Plant has emerged as India's largest pellet exporter in recent years.

Arcelor Mittal Nippon Steel India, i.e. , ('AM/NS India'), (formerly known as Essar Steel as Essar Steel was acquired jointly by Arcelor Mittal and Nippon Steel in December 2019) has 8 MTPA iron ore pellet plant in Visakhapatnam, Andhra Pradesh, to cater to the pellet requirements of the HBI plant in Hazira, Gujarat. The plant has an assured supply of high-quality iron ore from the beneficiation plant at Bailadilla, Chhattisgarh. The plant is capable of producing both DR and BF grade pellets and is linked to the Visakhapatnam port through conveyors to enable easy material movement in and out of the plant. The plant is located strategically near a deep draft, all-weather port that ensures the movement of large vessels to supply pellets throughout the year to the Hazira steel-making facility. A 6 million tpy pellet plant is located at Paradip in the iron-ore-rich State of Odisha. The plant has an assured supply of high-quality iron ore from the beneficiation plant at Dabuna, Odisha. The Paradip Pellet plant is likely to add another 6 million tpy to its capacity the work towards which is under completion. After completion of this plant AM/NS India's total pelletisation capacity at Paradip would get augmented to 12 million tpy and supported by a 20-million-tonnes pellet-making capability, the Company is on its way to become the largest pellet producer in India.

NMDC has forayed in pellet-making through setting up of a 1.2 MTPA pellet plant at Donimalai. Another 2 MTPA pellet plant is in the process of being set up at Nagarnar, Chhattisgarh.

KIOCL is currently engaged in the business of manufacturing and selling of iron ore pellets. The state-of-the-art pelletisation plant with 3.5 million tpy rated capacity and 0.216 million tpy Blast Furnace Unit is located at Mangaluru. During the year 2019-20, KIOCL Ltd achieved production of 2.210 million tonnes of pellets.

Steel plants are likely to increase usage of pellets in their production process to reduce pollution and increase productivity. Moreover, the forecast of spike in growth in Infrastructure, Real Estate and Automobile Sectors in the ensuing years are expected to augment demand for steel, which in turn would raise the demand and prices of pellets in the near future.

Sintering

In sintering process, iron ore fines, other iron-bearing wastes and coke dust are blended and combusted. The heat fuses the fines into course lumps that can be charged to a blast furnace. There are about thirty-nine sintering plants in the country about which information is available and have a total capacity of about 96.131 million tonnes per annum. Most of the Integrated Steel Plants (ISP) in the country have their own sintering plants. Sinter plants receive raw material mostly from their captive mines. Information on Name Location and installed capacity of pellets and sintering plants are provided in Table-8.

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 section.The post-liberalisation regime has witnessed Expression 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.

The production of pig iron has increased from 1.6 million tonnes in 1991-92 to 5.76 million tonnes in 2021-22. The Private Sector accounted for 89% of the total production of pig iron (5.76 MT) in the country in 2020-21. As per National Steel Policy 2017, the demand for pig iron for merchant use, such as, for castings and supplementary metallic in the electric arc or induction furnaces is projected to increase to 17 million tonnes by 2030- 31.

Sponge iron

India is the world's largest producer of sponge iron or Direct Induced Iron (DRI) with a host of coal-based units located in the mineral-rich States of the country. Over the years, the coal-based route has emerged as a key contributor and accounted for 77% of the total sponge iron production in the country during 2021-22. The growth of Sponge Iron Industry during the last few years in terms of capacity has been substantial. The installed capacity of sponge iron increased from 1.52 million tonnes per annum in 1990-91 to around 47.85 million tonnes in 2019-2020. Production increased from 0.9 million tonnes in 1990-91 to 39.03 million tonnes in 2021-22. As per National Steel Policy 2017, the demand for sponge iron is projected to increase to 80 million tonnes by 2030-31. It is projected that the sponge iron capacity may increase to 114 million tonnes by 2030-31 with around 30% share of gas-based capacities on account of increased environmental considerations and long-term availability of gas.

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 & Scrap and Slag".

Ferroalloys

Iron is an important constituent of ferro-alloys, like ferromanganese (high carbon, medium carbon and low carbon), ferrosilicon, ferrochrome (high carbon and low carbon)/charge chrome, ferromolybdenum, ferrovanadium, ferrotungsten, ferro-silicon-magnesium, ferroaluminium, ferro-silicon-zirconium, ferrotitanium, etc. Ferroalloys are used in Steel Industries to impart some special qualities in steel making process.They are consumed in domestic industries and are also exported. The details about the Ferroalloys Industry are provided in the Review on 'Ferroalloys'.

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'.

USES & SPECIFICATIONS

Iron ore is mainly used for manufacturing pig iron, sponge iron and steel. It is also used in Cement, Coal Washeries, Ferroalloys, Foundry and Glass Industries. The specifications of iron ore consumed by major sponge iron plants are furnished in Table-9.

CONSUMPTION

In 2021-22 the apparent consumption of iron ore was about 236 million tonnes, as against 174 million tonnes in the previous your. Plantwise specifications of iron ore in steel plants has been furnished in Table-10 and Apparent Consumption of iron ore from 2019-20 to 2021-22 has been provided in Table-11.

Table – 8 :Name, location and Installed Capacity of Pellets and Sinters Plants (By Plants)

(In million tonnes)

Name & location of plant	Annual installed capacity
A) Pellet Plants	
1. Amba River Coke Ltd, (A wholly owned subsdiary co. of JSW Steel Ltd), Dolvi, Maharashtra	12.0
2. Atibir Industries Co. Ltd. Unit-II, Bhorandiha, Jharkhand	0.3
3. Ardent Steel Ltd, Phulj Keonjhar, Odisha	0.8
4. Arya Iron and Steel Company (AISCO) Barbil, Odisha	1.2
5. Pellet Sponge Iron Plant BMM Ispat, Karnataka	2.4
6. Arcelor Mittal Nippon Steel India, Visakhapatnam, Andhra Pradesh	8.0
7. Arcelor Mittal Nippon, Steel India, Paradip Port,Odisha.	12.0
8. Godawari Power & Ispat Ltd Siltara, Chhattisgarh	2.7
9. Jindal Steel & Power Ltd, Barbil, Odisha	10.0
10. Jindal Saw Ltd, Bhilwara, Rajasthan	1.5
11. JSW Steel Ltd, Tornagallu, Toranagally, Ballariy, Karnataka	17.2

(contd)

Table-8 (contd) (In million tonnes)

Name & location of plant	Annual installed capacity
12. Jayaswal Neco Industries Ltd, Siltara, Raipur, Chhattisgarh	1.5
13. KIOCL Ltd, Panambur, Mangaluru, Karnataka	3.5
14. Mandovi Pellets Ltd, Near Borim Bridge, Shiroda, Goa – 403 103	1.8
15. Minera Steel & power Private Ltd, Ballari, Karnataka	0.6
16. MSP Steel & Power Ltd, Raigarh, Chhattisgarh	0.9
17. NMDC Ltd, Donimalai, Karnataka.	1.2
18. Orissa Metalics Private Ltd, Paschim Mednapore, West Bengal	3.6
19. Rashmi Metaliks Ltd, Shyamraipur, Gokulpur, West Midnapore, West Bengal	1.2
20. Sarda Energy and Minerals Ltd, Siltara, Mandhar, Raipur, Chhattisgarh	0.8
21. Shri Bajarang Power & Ispat Ltd, Borjhara, Tilda & Gondwara, Raipur, Chhattisgarh	1.4
22. Tata Steel Limited, Jamshedpur, East singbhum, Jharkhand	8.0
23. Xindia Steels Ltd, Kunikere & Hirebaganal Ginigera, Koppal, Karnataka	0.8

(contd)

Table-8 (contd) (In million tonnes)

Name & location of plant	Annual installed capacity
24. Bhushan Power & Steel Ltd Sambalpur, Odisha	3.85
25. Shyam Metalics And Energy Ltd Sambalpur, Sambalpur, Odisha	3.0
26. MSP Metallics Ltd, Jharsuguda, Odisha	0.6
27. River Pellets Limited, jaipur, Odisha	4.0
28. Sree Metaliks Ltd-Keonjhar keonjhar, Odisha	0.6
29. MSP Sponge Iron Ltd, Keonjhar, Odisha	0.75
30. Rungta Mines, kamanda, Sundergarh, Odisha	3.0
31. Essel Mining & Industries Lyd. Keonjhar, Odisha	1.0
32. Shri Jagannath Steels&Power Ltd (KJS Group), Keonjhar, Odisha	1.2
33. Shri Mahavir Ferro Alloys Ltd. Sundergarh, Odisha	1.6
34. MSPL Limited, Koppal, Karnataka	1.2
35. Janki Corpora?on Ltd Bellary, Karnataka	0.6
36. Rashmi Udyog Private Ltd (Rashmi Group), Paschim Midnapur, West Bengal	1.2
37. Orissa Alloy Steel Pvt. Ltd. (Rashmi Group), Kharagpur, West Bengal	3
38. Shakambhari steel, Purulia, West Bengal	2

(contd)

Table-8 (contd) (In million tonnes)

Name & location of plant	Annual installed capacity
39. Super Smelters Sponge P Ltd, Jamuria, Paschim Bardhman West Bengal	1.2
40. Bravo Sponge Iron P Ltd Purulia, West Bengal	0.85
41. Shyam Sel And Power Ltd (Jamuria), Paschim Bardhman, West Bengal	3
42. Ankit Metal And Power Ltd. Bankura, West Bengal	0.6
43. Tata Sponge Iron Ltd Main Plant-1& 2, Gamharia, Jharkhand	1.2
44. Rungta Mines, Chaliyama, Saraikela Jharkhand	3
45. Amalgam Steel Private Limited (Formerly Adhunik Alloys), Saraikela\ Jharkhand	1.2
46. JSW Ispat Special Products Ltd. (Raigarh), Raigarh, Chhattisgarh	2.2
47. Raipur Power & Steel Durg, Durg, Chhattisgarh	0.6
48. Rashi Steel And Power Ltd, Bilaspur, Chhattisgarh\	0.4
49. Sal Steel Ltd (Shah Alloys Ltd), Gandhinagar, Gujarat	0.6
50. Vinayak Steels Ltd, Mehboobnagar, Telangana	0.07
51. Gullantt Ispat Ltd, Gorakhpur, Uttar Pradesh	0.79

(contd)

Table-8 (contd) (In '000 tonnes)

Name & location of plant	Annual installed capacity
B) Sintering Plant	
1. Atibir Industries Co. Ltd. Unit-II, Bhorandiha, Jharkhand	680
2. Bokaro Steel Plant, Jharkhand	6900
3. Bhilai Steel Plant, Bhilai, Durg, Chhattisgarh.	6334
4. Bhushan Steel Ltd, Dhenkanal, Odisha	6680
5. Durgapur Steel Plant, West Bengal	3009
6. Electrosteel Casting Ltd Khardah, Barrackpore, West Bengal	365
7. Electrosteels Ltd, Siyaljori, Jharkhand	2980
8. Gerdau Steel India Ltd, Tadipatri, Anantpur, A.P.	470
9. IISCO Steel Plant, SAIL Burnpur, West Bengal	3880
10. Jayaswal Necco Industries Ltd, Siltara Growth Centre, Raipur-493 221, Chhattisgarh	729
11. Jindal Steel & Power Ltd, Raigarh, Chhattisgarh	2300
12. Jindal Saw Ltd, Mundra, Gujarat	900
13. JSW Steel Ltd, Tornagallu, Toranagallu, Ballari, Karnataka	12950

(contd)

Table-8 (contd) (In '000 tonnes)

Name & location of plant	Annual installed capacity
14. JSW Steel Ltd, Dolvi Works, Raigad, Maharashtra	5400
15. JSW Steel Ltd Salem works, Mkalipatti, Metturdam, Tamil Nadu	1106
16. Jai Balaji Industries Banskopa, West Bengal	608
17. Kalyanigerdua Steels Ltd, formerly sjk steel plant, Jambulapadu, Tadipatri, Andhra Pradesh	500
18. Kirloskar Ferrous Industries Ltd, Bevinahalli, Koppal, Karnataka.	500
19. KIC Metaliks Ltd, Raturia, Angadpur, Durgapur. West Bengal	336
20. Monnet Ispat and Energy Raigarh, Chhattisgarh	962.3
21. Mukund Ltd, M/s Hospet Steel Ltd, Ginigera, Koppal, Karnataka	500
22. Neometaliks Ltd, Gopalpur, Durgapur, West Bengal	316
23. Neelachal lspat Nigam Ltd, Kalinga Nagar, Industrial Complex, Duburi-755 026, Distt Jajpur, Odisha.	1710
24. Rashmi Metaliks Ltd, Shyamraipur, Gokulpur, West Midnapore, West Bengal.	1440

(contd)

Table-8 (contd) (In '000 tonnes)

Name & location of plant	Annual installed capacity
25. RINL, Visakhapatnam Steel Plant No. -1& 2 , Visakhapatnam, Andhra Pradesh	5256
26. RINL, Visakhapatnam Steel Plant No. -3, Andhra Pradesh	3600
27. Rourkela Steel Plant, Odisha	5300
28. SBQ Steel Ltd, Gudur, Nellore, Andhra Pradesh	240
29. Sri Kalahasthi Pipes Ltd, Chitoor, Andhra Pradesh	500
30. SLR Metaliks Ltd, Ballari, Karnataka	350
31. Sesa Goa Ltd, Vedanta Ltd, North Goa	1000

(contd)

Table-8 (concld) (In '000 tonnes)

Name & location of plant	Annual installed capacity
32. Sunflag Iron & Steel Co. Ltd, Warrthy, Bhandara, Maharashtra	450
33. Tata Steel Ltd, Jamshedpur, Jharkhand	8000
34. Tata Metaliks Ltd, Kharagpur, West Bengal	528
35. Tata Steel Ltd, Kalingnagar, Odisha	5750
36. Usha Martin Ltd (Usha Alloys and Steel Division), Jamshedpur.	715
37. Uttam Galva, Metallics Ltd, Wardha, Maharashtra	887
38. Vedanata Ltd. Amona, Goa	1000
39. Value Added business, Amona, Goa	1000

Table - 9 : Specifications of Iron Ore Consumed by Major Sponge Iron Plants

Sl. No.	Name of the Plant	Specifications				
		Size	Fe	$Al_2O_3 + SiO_2$	P	S
1.	Orissa Sponge Iron Plant	5– 18 mm	65% min.	4.5% max.	0.03% max.	N. A.
2.	Welspun Max Steel Ltd	9– 16 mm	66%	2.6% max.	0.05%	0.01%
3.	Sunflag Iron & Steel Ltd	5– 20 mm	67.5%	–	–	–
4.	NMDC Ltd (Sponge iron unit)	6– 20 mm	55–58% & 64–66%	–	–	–
5.	Essar Steel Ltd	10– 40 mm	67%	2.60% max.	0.05%	0.01%
6.	Jindal Steel & Power Ltd	10– 30 mm	65% min.	3% max. (SiO_2)	0.05%	–
7.	Tata Sponge Iron Ltd	5– 18 mm	65% min.	5% max.	–	–
8.	Steel Exchange India Ltd	10– 40 mm	62%	–	–	–
9.	Sarda Energy & Minerals Ltd	5– 18 mm	65–66%	–	–	–
10.	OCL Iron & Steel Ltd	Sized	62% min.	–	–	–
11.	Nalwa Steel & Power Ltd	5– 20 mm	63% min.	–	–	–
12.	Shri Bajrang Power & Ispat Ltd	5– 18 mm	64% min.	–	–	–
13.	Jai Balaji Industries Ltd	5– 18 mm	65%	5%	0.05%	0.03%
		10– 30 mm	–	–	–	–
		10-150 mm	–	–	–	–

Table – 10 : Specifications of Iron Ore (By Steel Plants)

Steel plant	Specifications
Bokaro Steel Plant, Bokaro, Jharkhand	Lumps: Fe-63.40%, SiO_2:2.25%, Al_2O_3 2.39%, Size: 10-40 mm Fines: Fe - 62.24%, SiO_2 - 3.36%, Al_2O_3 - 3.45%
Durgapur Steel Plant, Durgapur, West Bengal	Lumps : Fe - 62.48%, Al_2O_3 - 2.42%, Size: 10-50 mm Fines: Fe - 62.8%, SiO_2 - 2.28%, Size : -10 mm
IISCO Steel Plant, Burnpur, West Bengal	Lumps: Fe - 62.86%, SiO_2 - 2.56%, Al_2O_3 - 2.56% (max.), Size: 10-40 mm
Bhilai Steel Plant, Chhattisgarh	-
Rourkela Steel Plant SAIL, Rourkela,Odisha	-

(contd)

Table-10 (concld)

Steel plant	Specifications
JSW Steel Ltd Dolvi Works Raigad, Maharashtra.	-
JSW Steel Ltd Tornagallu, Sandur, Ballari Karnataka	-
JSW Steel Ltd Salem works, Mkalipatti, Metturdam, Tamil Nadu	-
Tata Steel Limited, Jamshedpur	-
RINL Vishakhapatnam Steel Plant, Andhra Pradesh	Lumps : Fe 65.5 % min. SiO_2 2.25 % max., Al_2O_3 2.25 % max. Fines : Fe 64.5 % min. SiO_2 3.00 % max. Al_2O_3 3.00 % max.

Table -11 Apparent Consumption* of Iron Ore 2019-20 to 2021-22 (By Industries)

('000 tonnes)

Industry	2019-20	2020-21 (R)	2021-22 (P)
Production	244083	205041	253973
Imports	1245	766	6683
Opening stocks*	163121	146718	121170
Exports	36625	57723	26494
Closing stocks	146178	121170	119188
Apparent consumption 1+2+3- 4+5	**225646**	**173632**	**236144**

Figures rounded off

** Closing stocks of Preceding year*

TRADE POLICY

To ensure easy availability of raw material in domestic market at reasonable prices, export duty on iron ore is @ 30% for both lumps and fines varieties of 58% Fe content and above. The export duty is @ 0% for both lumps and fines varieties of iron ore less than 58% Fe content. The export duty on iron ore pellets is NIL. Export duty on iron ore originated from NMDC is @ 10% when exported by MMTC Ltd under LTA to Japan and South Korea.

As per the Foreign Trade Policy (FTP) for 2015-20 and the amended Export and Import Policy incorporated in the FTP, the present export policy for iron ore as construed is furnished below in brief. As per the policy, imports of iron ore lumps, fines, concentrates and agglomerated pellets are freely allowed.

HS Code	Item	Export Policy
2601	Iron ore and concentrates, including roasted iron pyrites	Free
260111	Iron ore and concentrates, other than roasted iron pyrites: Non-agglomerated	Free
26011111	60% Fe or more but below 62% Fe	Free
26011112	62% Fe or more but below 65% Fe	Free
26011119	65% Fe and above	Free
26011121	Iron ore lumps (below 60% Fe, including black iron ore containing up to 10 % Mn)–Iron Ore lumps below 55% Fe	Free
26011122	Iron ore lumps (below 60% Fe, including black iron ore containing up to 10 % Mn) – Iron Ore lumps 55% Fe or more but below 58% Fe	Free
26011129	Iron ore lumps (below 60% Fe, including black iron ore containing up to 10 % Mn) – Iron Ore lumps 58% Fe or more but below 60% Fe	Free
26011131	Iron ore fines (62% Fe or more)– 62% Fe or more but below 65% Fe	Free
26011139	Iron ore fines (below 62% Fe or more)– 65% Fe and above	Free
26011141	Iron ore fines (below 62% Fe) – below 55% Fe	Free
26011142	Iron ore fines (below 62% Fe) –55% Fe or more but below 58% Fe	Free
26011143	Iron ore fines (below 62% Fe) – 58% Fe or more but below 60% Fe	Free
26011149	Iron ore fines (below 62% Fe) – 60% Fe or more but below 62% Fe	Free
26011150	Iron ore concentrates	Free
26011190	Others	
260112	Iron ore and concentrates other than roasted iron pyrites: Agglomerated	Free
26011210	Iron ore pellets	Free
26011290	Other	Free
26012000	Roasted iron pyrites	Free

***Source**: ITC(HS), 2018, Schedule 2 Export Policy ; STE: State Trading Enterprise*

WORLD REVIEW

The world reserves of crude iron ore are estimated to be around 180 billion tonnes. In terms of iron content, the iron ore reserves are estimated to be around 85 billion tonnes. The world reserves of crude iron ore and iron content by principal countries are furnished in Table - 12.

In 2021, the world production of iron ore was 3,108 million tonnes as against 3,029 million tonnes in the previous year. Australia with 922 million tonnes (30%), China 850 million tonnes (27%), Brazil 431 million tonnes (14%), India 198 million tonnes (6%), Iran 105 million tonnes, Russia 100 million tonnes, Ukraine 79 million tonnes (3%) and South Africa 73 million tonnes, Kazakhstan 73 million tonnes and Canada 57 million tonnes (2% each) were the principal producers. These ten countries accounted for about 93% of the world production of iron ore and the remaining 7% was contributed by other countries. The world production of iron ore is provided in Table-13.

To provide a generalised view of the development in various countries, country-wise description sourced from the latest available publication of Minerals Yearbook 'USGS' 2018 is furnished below.

Australia

Production of iron ore in Australia was 900 million tonnes in 2018, a slight increase from 885 million tonnes in 2017. Three iron-ore mining companies in Australia—BHP Billiton Ltd., Fortescue Metals Group Ltd., and Rio Tinto Ltd.—were among the four leading iron ore producers in the world and accounted for most of the iron ore produced in Australia. BHP Billiton's iron ore production in Australia in fiscal year (FY) 2018, which ended June 30, 2018, was 238 million tonnes, a 3% increase from that of FY 2017. The company reported a decrease in production costs and an increase in seaborne ore prices in FY 2018 compared with those in the FY 2017. In 2018, BHP Billiton planned to improve productivity through transportation improvements at Port Hedland and a dumper car maintenance program to achieve between 241 and 250 million tonnes of iron ore production in FY 2019 . Fortescue's iron ore shipments were 168 million tonnes in FY 2019, a slight decrease from 170 million tonnes in FY 2018. Fortescue approved the $2.6 billion Iron Bridge Magnetite Project to develop 22 million tonnes/yr of 67% concentrates by midyear 2022. The company continued its autonomous haulage truck project, completing conversion to a fully autonomous fleet by midyear 2020. Rio Tinto's share of iron ore production at its operations in Australia was 281 million tonnes in 2018, a 4% increase from 271 million tonnes in 2017. In December 2018, Rio Tinto launched the world's first automated heavy-haul, long-distance rail network. The company approved the Koodaideri Mine Project, a $2.6 billion, 43-million tonnes/yr iron ore mine and processing facility to be completed in late 2021.

Brazil

Production of iron ore in Brazil was 460 million tonnes in 2018, a slight increase from 454 million tonnes in 2017. Vale S.A., leading iron ore producer in Brazil, increased production in 2018 to 385 million tonnes, a 5% increase from 367 million tonnes in 2017, and increased its pellet production in 2018 to 55.3 million tonnes, a 10% increase from 50.3 million tonnes in 2017 In December 2018, Anglo American plc restarted operations at the Minas Rio Mine in Minas Gerais following the March 2018 discovery of leaks in a slurry pipeline that transported ore to a port in Rio de Janeiro. Repairs required the replacement of approximately 4 kilometers (2.5 miles) of pipeline.

China

China produced 335 million tonnes of iron ore in 2018, a 3% decrease from 345 million tonnes in 2017. Increasing demand from steel producers in China for high-grade iron ore blends, primarily originating in Australia and Brazil, were driven by stricter emissions requirements from the Government of China for steel producers.

Table – 12 : World Reserves of Iron Ore (By Principal Countries)

(In million tonnes)

Country	Reserves	
	Crude ore	Iron content
World : Total (rounded off)	**180000**	**85000**
USA	3000	1000
Australia [a]	51000	27000
Brazil	34000	15000
Canada	6000	2300
Chile	NA	NA
China	20000	6900
India	5500	3400
Iran	2700	1500
Kazakhstan	2500	900
Mauritania	NA	NA
Mexico	NA	NA
Peru	2600	1200
Russia	29000	14000
South Africa	1000	670
Sweden	1300	600
Turkey	130	38
Ukraine[b]	6500	2300
Other countries	18000	9500

Source: *USGS, Mineral Commodity Summaries, 2023.*

(a): For Australia Joint Ore Reserves Committee compliant reserves were about 23 billion tonnes for crude ore and 10 billion tonnes for iron content.

(b): For Ukraine, reserves consist of the A and B categories of the Soviet reserves classification system.

** As per UNFC system as on 1.4.2020, India's reserves/ resources of Iron ore (Haematite) and Iron ore (Magnetite) were estimated at 24,057 million tonnes and 11,227 million tonnes respectively.*

NA - Not available.

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

(In tonnes)

Country	2019	2020	2021 (P)
World: Total (rounded off)	**3056000000**	**3029000000**	**3108000000**
Australia	917 045 579	918 063 223	922159323
China	844356000	845000000	850000000
Brazil	396841000	387990000	430550725
India [(b)]	246081000	204481000	198300000
Iran [(c)]	91778118	104818915	104900000
Russia	97500 000	100200 000	100600000
Ukraine	76134000	78837700	79000000
South Africa [(d)]	72430288	55635421	73090918
Kazakhstan	45221900	62865000	64089700
Canada [(a)]	59013000	60059572	57491803
Other countries	209327314	210997238	227870805

Source: *BGS World Mineral Production, 2017-2021.*

Note *: World Total may not tally as data has been rounded off*

(a) Including by-product iron ore.

(b) Years ended 31st March following that stated

(c) Years ended 20th March following that stated

(d) Including by-product magnetite; (e) estimated

** India's production of iron ore in 2019-20, 2020-21 and 2021-22 was 244.08 million tonnes, 205.04 million tonnes and 253.97million tonnes, respectively.*

FOREIGN TRADE

Exports

Exports of iron ore decreased by 54% to 26.49 million tonnes in 2021-22 from 57.72 million tonnes in the previous year. Exports were mainly to China (83%) and Indonesia (3 %). The total exports of iron ore in 2021-22, in terms of quantity comprised iron ore fines 14.57 million tonnes (55%), iron ore pellets 11.39 million tonnes (43%), iron ore lumps 0.43 million tonnes (2%) and negligible quantity of iron ore non-agglomerated concentrate and iron ore pyrites. (Tables- 14 to 19).

Imports

Imports of iron ore increased manifold to 6.68 million tonnes in 2021-22 from 0.76 million tonnes in the previous year. Imports of iron ore were from Brazil (47%), Australia (36%), South Africa (14%) and negligible amount from other countries. The total imports in 2021-22 comprised iron ore fines (61%), non-agglomerated concentrates (22%) and iron ore lumps (14%) (Tables-20 to 25).

Table – 14 : Exports of Iron Ore : Total (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	57723	362556021	26494	241480427
China	51975	314421802	21861	184557519
Indonesia	594	5375145	912	10908862
Korea, Rep. of	658	5710435	501	7640882
Oman	698	6283030	454	7029303
Italy	++	9	332	4792480
Malaysia	742	6605067	365	4188281
Netherlands	++	2573	236	3391731
Brazil	331	4076384	212	3044805
Poland	73	592883	204	2702460
Germany	++	430	156	2429644
Other Countries	2652	19488263	1261	10794460

Figures rounded off

Table – 15: Exports of Iron Ore : Lumps (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	2239	13118637	433	1876849
China	1502	6811960	415	1779342
Singapore	-	-	18	88567
Germany	++	++	++	3599
Congo, D. Rep. of	++	117	++	2850
Tanzania	-	-	++	1912
Australia	++	34	++	355
Nepal	1	732	++	224
Japan	723	6279621	-	-
UAE	13	25884	-	-
Ethiopia	++	235	-	-
Other Countries	++	54	-	-

Figures rounded off

Table – 16: Exports of Iron Ore: Fines (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	40661	215190641	14570	83677314
China	38388	200434020	13846	81327260
Qatar	-	-	78	558398
Malaysia	65	234948	81	466654
Japan	1277	8774308	74	366722
Nepal	85	171405	294	260198
Singapore	-	-	46	220237
Indonesia	97	469465	53	197685
UAE	39	118907	50	174887
Kenya	-	-	48	104826
Hungary	-	-	++	395
Other Countries	710	4987588	++	52

Figures rounded off

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

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	++	46040	++	30702
Netherlands	++	2573	++	4615
Bangladesh	++	2465	++	3187
Turkey	-	-	++	2857
Saudi Arabia	++	5567	++	2855
Korea, Rep. of	++	563	++	2659
Thailand	++	2246	++	2627
Myanmar	-	-	++	2475
Philippines	-	-	++	2439
UAE	++	1585	++	1817
Nigeria	++	492	++	984
Other Countries	++	30549	++	4187

Figures rounded off

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

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	363	1781069	100	669724
China	309	1707189	50	356302
Indonesia	-	-	47	310748
Nepal	9	13018	3	2522
Germany	++	2	++	86
Australia	++	12	++	21
Canada	-	-	++	15
Kenya	1	1329	++	12
France	++	2	++	9
Korea, Rep. of	-	-	++	4
Bhutan	-	-	++	3
Other Countries	44	59517	++	2

Figures rounded off

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

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	14460	132419634	11391	155225838
China	11776	105457429	7550	101094123
Indonesia	497	4905680	812	10399695
Korea, Rep. of	142	1600668	501	7638219
Oman	698	6283030	454	7029303
Italy	++	9	332	4792480
Malaysia	677	6369416	284	3721001
Netherlands	-	-	236	3387116
Brazil	331	4076384	212	3044805
Poland	73	592883	204	2702460
Germany	++	1	156	2425954
Other Countries	266	3134134	650	8990682

Figures rounded off

Table – 20: Imports of Iron Ore: Total (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	766	8445221	6683	35389345
Brazil	-	-	3156	16798568
South Africa	166	1793445	928	8854187
Australia	58	593329	2382	7932560
Ukraine	96	853813	152	1283813
Finland	61	461841	61	459404
Turkey	3	36744	2	21446
Croatia	2	20341	1	12082
Russia	1	14161	1	8143
China	++	8650	++	6565
Sweden	++	11707	++	6080
Other Countries	379	4651190	++	6497

Figures rounded off

Table – 21: Imports of Iron Ore Concentrates: Non-agglomerated (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	154	1484523	1446	9469224
Brazil	-	-	1264	7914628
Ukraine	96	853772	152	1283813
South Africa	-	-	30	263094
Sweden	++	11270	++	5868
USA	++	321	++	1100
UK	++	31	++	369
Germany	-	-	++	204
Canada	-	-	++	140
Australia	58	593329	++	6
UAE	-	-	++	2
Other Countries	++	25800	-	-

Figures rounded off

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

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	**379**	**4612581**	**170**	**874034**
Brazil	-	-	170	874034
Bahrain	379	4612542	-	-
Ukraine	++	39	-	-

Figures rounded off

Table – 23 : Imports of Iron Ore : Pyrites (By Countries)

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	**67**	**546483**	**65**	**512049**
Finland	61	461841	61	459404
Turkey	3	36744	2	21446
Croatia	2	20341	1	12082
Russia	1	14161	1	8143
China	++	8601	++	6565
Italy	++	3901	++	3704
USA	++	349	++	698
Oman	-	-	++	7
Malaysia	++	545	-	-

Figures rounded off

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

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	**166**	**1800782**	**927**	**8903226**
South Africa	166	1793445	898	8591093
Australia	-	-	29	311671
Sweden	++	437	++	212
Senegal	-	-	++	185
Germany	++	127	++	36
UAE	-	-	++	29
Mozambique	++	6768	-	-
Japan	++	5	-	-

Figures rounded off

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

Country	2020-21 (R)		2021-22 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	++	**852**	**4075**	**15630812**
Brazil	-	-	1722	8009906
Australia	-	-	2353	7620883
USA	-	-	++	23
France	++	850	-	-
Ukraine	++	2	-	-

Figures rounded off

FUTURE OUTLOOK

India is one of the leading producers of iron ore in the world. Among the consuming industries, Cement Industry is the second major consumer of iron ore after Iron & Steel Industry (including Sponge Iron Industry).

The Ministry of Steel under Government of India has introduced the new National Steel Policy, 2017 and with the roll out of the National Steel Policy, 2017 and the DMI & SP policy, it is envisaged that the industry can be steered with appropriate policy support in creating an environment for promoting domestic steel and thereby ensuring a scenario where production meets the anticipated pace of growth in consumption. Thus, the Indian Steel Sector is all set to achieve its vision thereby setting a global benchmark in terms of quality, standards and technology. It is anticipated that crude steel capacity of 300 million tonnes will be required by 2030-31 and to fulfill this capacity, about 437 million tonnes of iron ore is required. However, achieving crude steel capacity up to 300 million tonnes will require extensive mobilisation of natural resources, finances, manpower and infrastructure including land. To address the concerns regarding availability of raw material (iron ore) intensive & deeper exploration would have to be promoted for augmentation of resource base. Eco-friendly viable underground mining techniques for optimal utilisation of magnetite ore deposits locked in Western Ghats would also have to be explored in collaboration with mining research institutes. The Government has already promulgated the Mines and Minerals (Development and Regulation) Amendment Act, 2015 and therein has laid great emphasis on time bound mine development with increased stress on mineral exploration and sustainable mining operations which may support ore output growth.

The Act has brought clarity on mine allocation process (through auction) and procedures for mining lease renewal. The Act, further, provides for reservation of any particular mine for a particular end use and put conditions permitting auction among such eligible end users. Further as per the provision made in mineral (Aaclia)Rule 2015, under the aforesaid Act, a total of 115 mines keaves (Ml). composite licence for iron ore (witches lelocks of iron ore and other assorted minerals) were auctioned till 28th Dec. 2023 in the stats & Andhra Pradesh (5 blocks), Chhattisgarh (10 blocks), Goa (9 blocks), Jharkhand (3 blocks), Karnataka ((29 blocks), Madhya Pradesh (8 blocks), Maharashtra (12 blocks) Odisha (31 blocks), Rajasthan (6 blocks) and utter Pradesh (2 blocks).