Indian Minerals Yearbook 2020

(Part- III : Mineral Reviews)

59th Edition

IRON ORE

(ADVANCE RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

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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 33.276 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 1.4.2015 have been estimated at 22,487 million tonnes of which 5,422 million tonnes (24%) are under 'Reserves' category and the balance 17,065 million tonnes (76%) are under 'Remaining Resources' category. By grades, Lumps constitute about 56% followed by Lumps with Fines (17%), Fines (16%), and the remaining 11% 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 (7,559 million tonnes or 34%), Jharkhand (5,286 million tonnes or 23%), Chhattisgarh (4,858 million tonnes or 22%), Karnataka (2,467 million tonnes or 11%) and Goa (1,189 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 1.4.2015 have been estimated at 10,789 million tonnes of which 'Reserves' constitute a mere 53 million tonnes while 10,736 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 98% magnetite reserves/resources are located in five States, namely, Karnataka (7,802 million tonnes or 72%) followed by Andhra Pradesh (1,392 million tonnes or 13%), Rajasthan (617 million tonnes or 6%), Tamil Nadu (507 million tonnes or 5%) and Goa (266 million tonnes or 2%). Assam, Bihar, Chhattisgarh, Jharkhand, Kerala, Maharashtra, Meghalaya, Nagaland, Odisha and Telangana together account for the remaining 2% 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 246.08 million tonnes in the year 2019-20, showing an increase of about 19.17% as compared to that in the preceding year. There were 250 reporting mines in 2019-20 as against 252 in the previous year. out of the total, 36 mines were in the Public Sector and 214 in Private Sector. Besides, production of iron ore was reported as an associated mineral by 8 mines in 2019-20 which iremained the same compared to 2018-19. The con-

tribution of Public Sector to the total production was about 30.17% as against about 34.40 % in the preceding year . The remaining 69.83 % of the production in 2019-20 was from Private Sector which showed an increase as compared to 65.60 % in the preceding year Among 36 iron ore mines in Public Sector, 17 iron ore mines each producing more than one million tonnes annually accounted for about 96.38% of the total output in Public Sector during 2019-20. Out of 214 iron ore mines and 8 associated mines in Private Sector, 37 iron ore mines each producing more than one million tonnes annually accounted for about 86.25 % of the total output of Private Sector during the year. Thus, 54 iron ore mines each producing more than one million tonnes of iron ore annually contributed about 89.31% of the total output in 2019-20. The captive mines reported production of 72.56 million tonnes comprising about 29.49% of total production and non-captive mines reported production of 173.52 million tonnes, i.e., about 70.51% during 2019-20.

Gradewise analysis of the current year's output reveals that out of total output of 246.08 million tonnes, iron ore lumps constituted 76.36 million tonnes (i.e., about 31.04%), fines constituted 168.54 million tonnes (i.e., about 68.48%) and concentrates constituted 1.18 million tonnes (i.e., about 0.48%).

Among the States, Odisha recorded the highest production of 146.77 million tonnes, i.e., about 59.64% of the country's total production in 2019-20. Chhattisgarh was at the second place with a production of 34.72 million tonnes, i.e., about 14.11% of the total production followed by Karnataka with a production of 31.40 million tonnes, i.e., about 12.76% and Jharkhand with 26.89 million tonnes, i.e. about 10.92% of the country's production. The remaining 6.30 million tonnes, i.e., 2.57% production was reported from Andhra Pradesh, Goa, Madhya Pradesh, Maharashtra, Rajasthan and Telangana.

STOCKS AT MINE-HEAD

The mine-head closing stocks of iron ore for the year 2019-20 were 145.47 million tonnes as compared to 163.12 million tonnes in 2018-19.

EMPLOYMENT

The average daily employment of labour was 46,480 during 2019-20 as against 43,125 in the preceding year (Tables - 3 to 7).

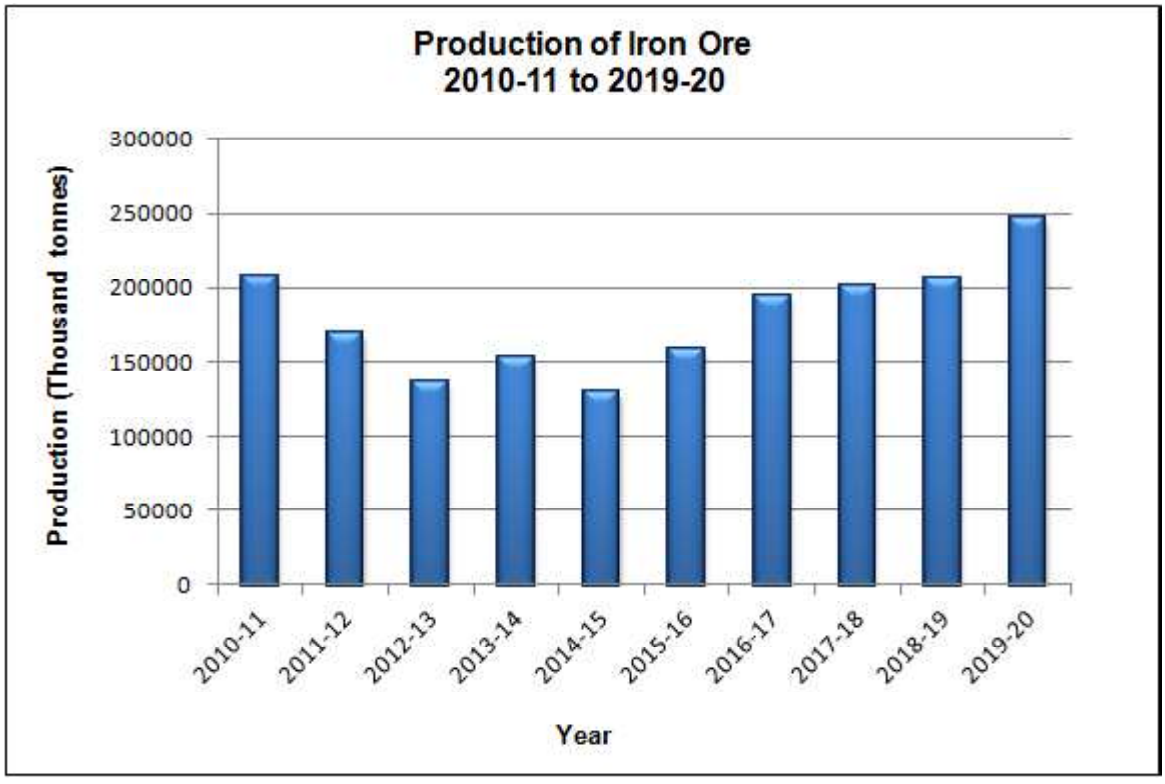


Table – 1 : Reserves/Resources of Iron Ore (Haematite) as on 1.4.2015
(By Grades/States)

(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	**4053032**	**449917**	**918801**	**5421751**	**3444103**	**1573822**	**1496674**	**1762741**	**1798557**	**4498142**	**2491176**	**17065214**	**22486965**
By Grades													
Lump, high grade	1207974	2751	213649	1424375	458544	40887	144840	198115	37065	195774	74865	1150092	2574466
Lump, medium grade	1021112	94231	325808	1441151	1726230	737324	645733	912442	997496	1141891	6039	6167154	7608306
Lump, low grade	122710	50314	89654	262679	195265	78584	132621	39796	127858	925985	225687	1725796	1988474
Lump, unclassified grade	204	28	16	248	56654	-	8791	16969	34488	152248	22800	291951	292200
Fines, high grade	271459	-	79169	350628	18995	1889	4849	146969	11174	25567	4890	214334	564962
Fines, medium grade	120083	62207	6571	188862	50161	265570	49801	337543	286918	494180	932	1485104	1673967
Fines, low grade	237700	31006	41557	310263	196422	119619	120401	11163	94702	401756	6094	950157	1260420
Fines, unclassified grade	389	-	593	982	343	669	130	8624	12908	118978	15200	156851	157833
Lumps & fines high grade	195566	12720	-	208286	84292	94614	67894	9748	8561	61307	112375	438791	647077
Lumps & fines medium grade	440515	73933	84121	598568	134534	56987	101242	994	15969	201152	241259	752136	1350705
Lumps & fines low grade	166999	5718	37294	210012	270249	73244	87740	27296	64404	431242	160391	1114567	1324579
Lumps & fines unclassified	123828	94850	26131	244809	73134	10373	21754	44082	100360	100693	4088	354485	599293
Black iron ore	-	-	-	-	7017	3014	1355	-	1059	6661	-	19106	19106
Lump low & medium grade	9529	5259	-	14788	-	13865	-	-	-	-	-	13865	28653
Beneficiable grade	31307	11183	714	43204	115078	44183	88181	1538	1003	64982	63708	378673	421877
Others	28413	-	2521	30934	19712	60	10861	708	1432	5197	745	38715	69649
Unclassified	60225	3356	8750	72331	36845	10699	8263	4746	3006	12094	27252	102905	175236
Not-known	2673	614	1148	4434	629	20000	1659	-	151	158432	1524850	1705721	1710155
Lumps & fines & blue dust unclassified grade	12345	1746	1106	15197	-	2241	560	2009	-	-	-	4810	20007

(contd)

Table-1(concld) (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						
By States													
Andhra Pradesh	17664	273	11832	29768	40595	49589	68425	377	4666	147628	13	311293	341062
Assam	-	-	-	-	-	-	-	-	8600	4000	-	12600	12600
Bihar	-	-	-	-	-	-	-	-	-	55	-	55	55
Chhattisgarh	1067636	78071	241730	1387437	255074	61735	47394	921139	613433	801086	770827	3470687	4858124
Goa	297271	34709	26259	358239	301806	214187	134955	15286	11535	141558	11747	831075	1189313
Jharkhand	365111	29238	45022	439372	1081242	458866	457724	207324	597413	673009	1371468	4847045	5286417
Karnataka	416684	46169	87394	550247	518155	48231	211632	248299	44094	669239	176956	1916607	2466854
Madhya Pradesh	44203	3635	14225	62063	48412	3650	36774	23243	9008	146803	10	267900	329963
Maharashtra	11283	3032	2926	17241	9028	6673	8858	75724	71806	72588	32185	276862	294103
Meghalaya	-	-	-	-	-	-	-	-	-	225	-	225	225
Odisha	1830569	252615	489034	2572217	1180055	704302	530440	271349	426493	1773077	100730	4986447	7558664
Rajasthan	2103	2175	380	4658	8764	6105	471	-	11510	6897	-	33745	38404
Telangana	509	-	-	509	973	483	-	-	-	23977	27240	52673	53181
Uttar Pradesh	-	-	-	-	-	20000	-	-	-	38000	-	58000	58000

Figures rounded off

Table – 2 : Reserves/Resources of Iron Ore (Magnetite) as on 1.4.2015
(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	**30352**	**2311**	**20037**	**52699**	**223388**	**15494**	**64091**	**1513195**	**1984566**	**6351286**	**584436**	**10736455**	**10789155**
By Grades													
Metallurgical	8355	-	3308	11663	165948	-	21530	690596	342792	964399	255	2185521	2197183
Coal washery	16782	-	15847	32629	265	675	11001	411	318	37512	15455	65636	98265
Foundry	-	-	-	-	330	125	-	-	-	381	-	836	836
Others	749	-	443	1192	3796	985	62	-	-	1791	-	6633	7826
Unclassified	4099	2311	196	6606	52978	13709	31493	822188	1641456	5066948	568677	8197449	8204056
Not-known	366	-	243	609	71	-	6	-	-	280254	48	280379	280989
By States													
Andhra Pradesh	-	-	-	-	43105	-	-	13800	1266666	68527	-	1392098	1392098
Assam	-	-	-	-	-	-	-	-	-	15380	-	15380	15380
Bihar	-	-	-	-	-	-	-	-	-	2659	-	2659	2659
Chhattisgarh	8087	-	3096	11183	-	-	42	-	-	-	-	42	11225
Goa	4364	-	626	4990	59509	14516	33512	-	-	151811	1997	261345	266336
Jharkhand	-	-	-	-	-	518	1986	411	3948	3722	82	10667	10667
Karnataka	319	127	-	446	120022	-	18375	1498957	479372	5345018	340000	7801744	7802190
Kerala	-	-	-	-	-	-	-	-	59912	23523	-	83435	83435
Maharashtra	359	-	225	583	149	-	63	-	-	90	-	302	885
Meghalaya	-	-	-	-	-	-	-	-	-	3380	-	3380	3380
Nagaland	-	-	-	-	-	-	-	-	5280	-	-	5280	5280
Odisha	74	-	-	74	8	-	-	27	-	43	-	79	152
Rajasthan	17148	2185	16090	35423	595	460	10113	-	-	554904	15422	581493	616916
Tamil Nadu	-	-	-	-	-	-	-	-	169388	110728	226921	507037	507037
Telangana	-	-	-	-	-	-	-	-	-	71500	14	71514	71514

Figures rounded off

Table - 3 :Principal Producers of Iron ore 2019-20

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 Ballary
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 – 400 001,	Jharkhand Odisha Maharashtra	Singhbhum (West) Keonjhar
Rungta Mines Ltd 8A Express Tower, 42 A-Shakespeare Sarani, Kolkata – 700 017, West Bengal	Jharkhand Odisha	Singhbhum (West) Keonjhar
Essel mining & Industries Ltd Industry House, 18th Floor, 10 Camac street, Kolkata-700069	Odisha West Bengal.	Sundargarh Keonjhar
Odisha Mining Corporation Ltd, OMC House, Unit-5, P.B. No.34 Distt Khurda, Bhubaneswar-751 001, Odisha	Odisha	Keonjhar Sundargarh
Serajuddin & Co. P-16, Bentink Street, Kolkata-700069, West Bengal	Odisha	Keonjhar
Rungta Sons (P) Ltd 8A Express tower, 42A-Shakespeare Sarani, Kolkata - 700 017, West Bengal	Odisha	Sundargarh
Ramesh Prasad Sao, Euroean Quarter, Opposite Gandhi Maidan, Chaibasa - 833 201 Distt Singhbhum (West), Jharkhand	Odisha	Keonjhar
Kamaljeet Singh Ahluwalia, Near MMTC Weigh Bridge P.B.No. 3, Distt Keonjhar, Barbil-758 035, Odisha	Odisha	Keonjhar
Sarda Mines (P) ltd., Room No. 64, 6th Floor Circular Court,8-AJC Bose Road, Kolkatta-700 017, West Bengal	Odisha	Keonjhar
Kaypee Enterprises, Near MMTC Weigh Bridge, ,	Odisha	Keonjhar **(contd)**

Table - 3 (Concld)

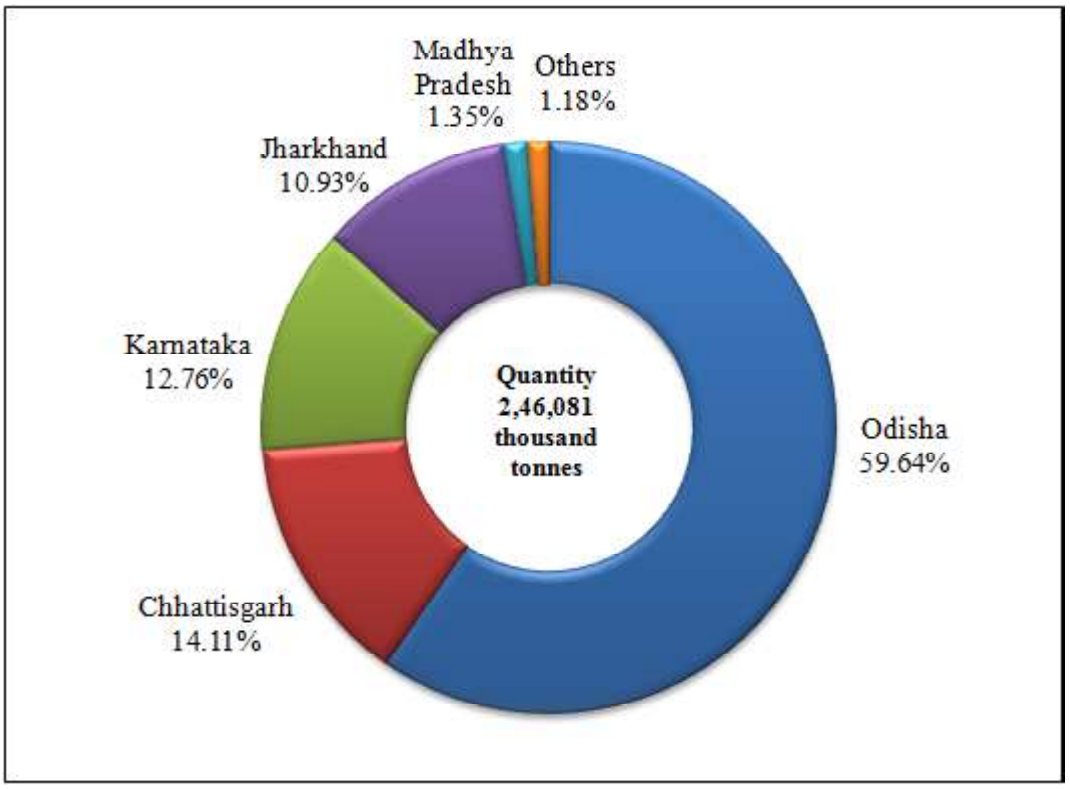
Name & address of producer	Location of mine	
	State	District
P.B. No.3, Distt Keonjhar At/PO-Barbil-758 035, Odisha		
Vedanta Ltd Sesa Ghor, EDC complex, Patto, Panaji, Tisavadi-403 001 Goa	Karnataka	Chitradurga
Indrani Patnaik, A/6, Commercial Estate, Civil Township, Rourkela - 769 004 Odisha	Odisha	Keonjhar
Bonai Industrial Co. Ltd Rungta Office, Main Road, Distt Keonjhar, P.O. Barbil-758 035, Odisha	Odisha	Sundargarh
Aryan Mining & Trading Corpn. (P) Ltd Aryan House 8th Floor, P-1, Hide Lane, Kolkata-700 073, West Bengal	Odisha	Sundargarh
Freegrade & Co. (P) Ltd 8 A, Express Tower, 42 A- Shakespeare Sarani, Kolkata- 700 017, West Bengal	Odisha	Sundargarh
Jindal Steel & Power Ltd O.P. Jindal Marg, Delhi Road, Hissar - 125 005 Haryana	Odisha	Sundargarh
Usha Martin Ltd Mangal Kalash, 2 A Shakespeare Sarani, Kolkata-700 071, West Bengal	Jharkhand	Singhbhum (West)
Khatau Narbheram & Co., N.V. Ram Complex, Distt Keonjhar, Barbil-758 035, Odisha	Odisha	Keonjhar
M.S.P.L. Ltd Baladota Enclave Abheraj, Baldota Road, Ballary-583203 Karnataka	Karnataka	Ballary
JSW Steel Ltd., Jaw Centre Bandra Kurla Complex, Bandra (East) - Mumbai-400 051, Maharashtra	Odisha	Sundargarh

Table – 4 : Production of Iron Ore, 2017-18 to 2019-20
(By States)

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

States		2017-18		2018-19		2019-20 (P)	
		Quantity	Value	Quantity	Value	Quantity	Value
India	**Total**	**201426**	**347131039**	**206494**	**453465829**	**246081**	**481074096**
	Lumps	65426	139519273	66679	192771883	76363	196800672
	Fines	134456	203119742	138355	255838795	168536	280076494
	Concentrates	1544	4492024	1460	4855151	1182	4196930
Andhra Pradesh	**Total**	**674**	**402892**	**654**	**402616**	**818**	**582701**
	Lumps	402	320091	362	269587	502	393190
	Fines	272	82801	292	133029	316	189511
Chhattisgarh	**Total**	**34418**	**81546969**	**34893**	**96985465**	**34724**	**100086047**
	Lumps	12222	31781088	11657	34056295	12175	38901080
	Fines	22196	49765881	23236	62929170	22549	61184967
Goa	**Total**	**10279**	**12616879**	**-**	**-**	**-**	**-**
	Lumps	2075	2149976	-	-	-	-
	Fines	8134	10386698	-	-	-	-
	Concentrates	70	80205	-	-	-	-
Jharkhand	**Total**	**20169**	**20636973**	**23433**	**27673520**	**26888**	**28897864**
	Lumps	6090	6984493	6272	8506371	7246	10051725
	Fines	14079	13652480	17161	19167149	19642	18846139
Karnataka	**Total**	**28691**	**74742826**	**29823**	**71114250**	**31402**	**66546365**
	Lumps	9427	27966193	9175	27209485	9250	24977063
	Fines	19264	46776633	20648	43904765	22152	41569302
Madhya Pradesh	**Total**	**2743**	**1239712**	**2802**	**1448203**	**3333**	**1729975**
	Lumps	359	186400	535	272805	1467	689247
	Fines	2384	1053312	2267	1175398	1866	1040728
	Concentrates	-	-	-	-	-	-
Maharashtra	**Total**	**940**	**1029104**	**660**	**836022**	**1131**	**1280677**
	Lumps	323	500406	283	447395	93	180171
	Fines	617	528698	377	388627	1038	1100506
Odisha	**Total**	**102186**	**150845108**	**113119**	**251111210**	**146773**	**278322931**
	Lumps	34398	69584107	38238	121963240	45442	121557457
	Fines	67504	80870647	74374	128140568	100973	156145292
	Concentrates	284	390354	507	1007402	358	620182
Rajasthan	**Total**	**1320**	**4066062**	**1108**	**3893253**	**1012**	**3627536**
	Lumps	126	43505	155	45415	188	50739
	Fines	4	1091	++	89	++	49
	Concentrates	1190	4021466	953	3847749	824	3576748
Telangana	**Total**	**6**	**4514**	**2**	**1290**	**-**	**-**
	Lumps	4	3014	2	1290	-	-
	Fines	2	1500	-	-	-	-

Quantity of Iron Ore Production in Different States, 2019-20



Value of Iron Ore Production in different States, 2019-20

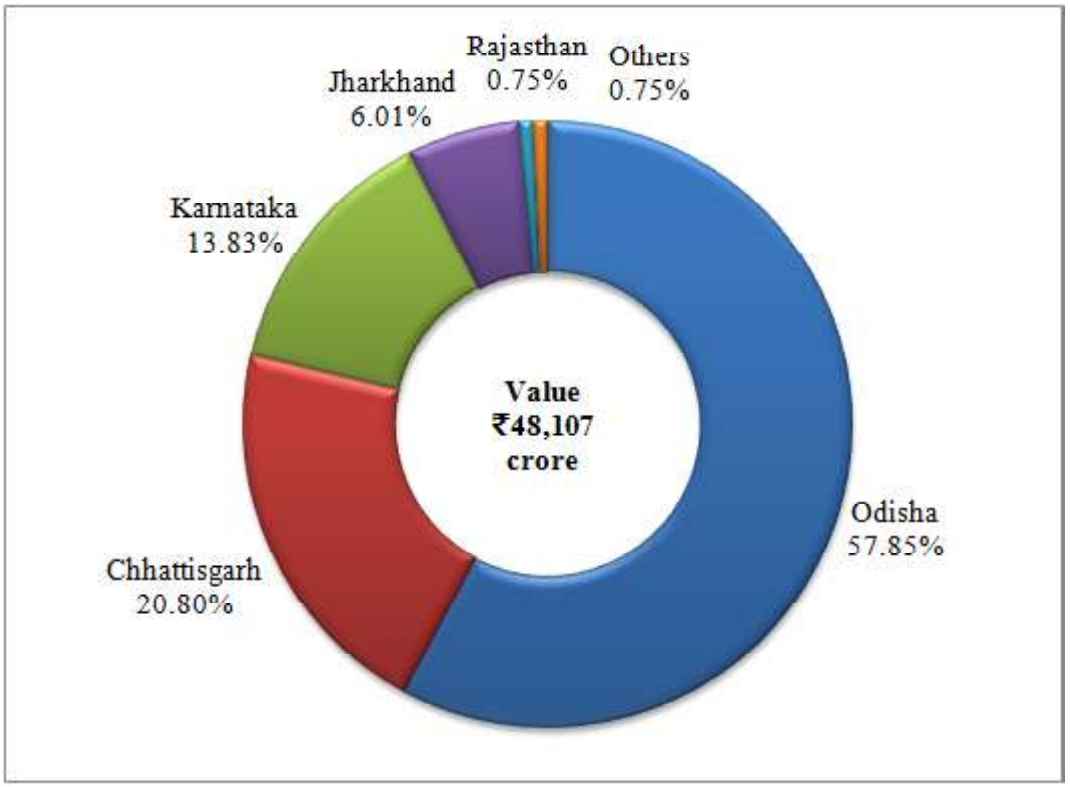


Table – 5 (A) : Production of Iron Ore, 2018-19
(By Sectors/States/Districts/Grades)

(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		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	**252(8)**	**2362**	**2423**	**4925**	**6592**	**31976**	**18401**	**66679**	**192771883**	**6005**	**4902**	**10704**	**21485**	**70715**	**24544**	**138355**	**255838795**	**1460**	**4855151**	**206494**	**453465829**
Public Sector	36	50	72	207	1855	14425	8971	25580	69855492	61	364	1152	9702	25057	9120	45456	97098096	-	-	71036	166953588
Private Sector	216(8)	2312	2351	4718	4737	17551	9430	41099	122916391	5944	4538	9552	11783	45658	15424	92899	158740699	1460	4855151	135458	286512241
Andhra Pradesh	**16**	**362**	**-**	**-**	**-**	**-**	**-**	**362**	**269587**	**292**	**-**	**-**	**-**	**-**	**-**	**292**	**133029**	**-**	**-**	**654**	**402616**
Anantapur	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cuddapah	2	282	-	-	-	-	-	282	207195	228	-	-	-	-	-	228	100403	-	-	510	307598
Krishna	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kurnool	11	80	-	-	-	-	-	80	62392	64	-	-	-	-	-	64	32626	-	-	144	95018
Nellore	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prakasam	1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chhattisgarh	**18**	**126**	**304**	**96**	**654**	**2272**	**8205**	**11657**	**34056295**	**791**	**418**	**442**	**3290**	**9765**	**8530**	**23236**	**62929170**	**-**	**-**	**34893**	**96985465**
Dantewara	6	-	-	31	4	63	8016	8114	30307292	-	10	112	499	8196	7506	16323	54748739	-	-	24437	85056031
Durg	4	18	-	-	419	2041	189	2667	2711337	15	-	-	2282	1536	391	4224	4424031	-	-	6891	7135368
Kanker	5	19	176	4	184	168	-	551	597656	490	305	247	495	33	633	2203	3047171	-	-	2754	3644827
Narayanpur	1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rajnandgaon	2	89	128	61	47	-	-	325	440010	286	103	83	14	-	-	486	709229	-	-	811	1149239
Goa	**45**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
North Goa	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Goa	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jharkhand	**20**	**4**	**237**	**936**	**1321**	**2084**	**1690**	**6272**	**8506371**	**109**	**1014**	**1121**	**2281**	**5610**	**7026**	**17161**	**19167149**	**-**	**-**	**23433**	**27673520**
Singhbhum (West)	20	4	237	936	1321	2084	1690	6272	8506371	109	1014	1121	2281	5610	7026	17161	19167149	-	-	23433	27673520
Karnataka	**54**	**453**	**1121**	**1094**	**1815**	**4428**	**264**	**9175**	**27209485**	**1320**	**1773**	**6215**	**2066**	**8911**	**363**	**20648**	**43904765**	**-**	**-**	**29823**	**71114250**
Bagalkot	3*	107	29	-	-	-	-	136	280247	45	-	-	-	-	-	45	65590	-	-	181	345837
Ballari	43	262	745	983	1106	4102	264	7462	22762310	659	1693	2669	1935	8726	363	16045	37702218	-	-	23507	60464528
Chitradurga	6	84	347	111	709	326	-	1577	4166928	616	80	3546	131	185	-	4558	6136957	-	-	6135	10303885
Tumakuru	2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(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 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	**18 (6)**	**524**	**11**	**-**	**-**	**-**	**-**	**535**	**272805**	**2266**	**-**	**1**	**-**	**-**	**-**	**2267**	**1175398**	**-**	**-**	**2802**	**1448203**
Chhatarpur	1*	22	11	-	-	-	-	33	12621	47	-	-	-	-	-	47	9612	-	-	80	22233
Gwalior	1	-	-	-	-	-	-	-	-	59	-	-	-	-	-	59	23560	-		59	23560
Jabalpur	15 (6)	495	-	-	-	-	-	495	249729	2160	-	1	-	-	-	2161	1142226	-	-	2656	1391955
Sagar	1*	7	-	-	-	-	-	7	10455	-	-	-	-	-	-	-	-	-	-	7	10455
Maharashtra	**12**	**142**	**28**	**96**	**17**	**-**	**-**	**283**	**447395**	**65**	**88**	**224**	**-**	**-**	**-**	**377**	**388627**	**-**	**-**	**660**	**836022**
Chandrapur	2	-	7	-	-	-	-	7	15106	-	-	-	-	-	-	-	-	-	-	7	15106
Gadchiroli	1	105	-	64	-	-	-	169	300152	-	-	-	-	-	-	-	-	-	-	169	300152
Gondia	3	8	-	-	-	-	-	8	15899	3	-	-	-	-	-	3	1832	-	-	11	17731
Sindhudurg	6	29	21	32	17	-	-	99	116238	62	88	224	-	-	-	374	386795	-	-	473	503033
Odisha	**62 (1)**	**594**	**722**	**2703**	**2785**	**23192**	**8242**	**38238**	**121963240**	**1162**	**1609**	**2701**	**13848**	**46429**	**8625**	**74374**	**128140568**	**507**	**1007402**	**113119**	**251111210**
Keonjhar	36	292	188	937	312	17225	7621	26575	83413248	731	567	248	8392	33905	8535	52378	90167288	-	-	78953	173580536
Mayurbhanj	2	34	97	633	-	129	113	1006	3513645	17	3	233	43	9	1	306	352612	-	-	1312	3866257
Sundargarh	24 (1)	268	437	1133	2473	5838	508	10657	35036347	414	1039	2220	5413	12515	89	21690	37620668	507	1007402	32854	73664417
Rajasthan	**7**	**155**	**-**	**-**	**-**	**-**	**-**	**155**	**45415**	**++**	**-**	**-**	**-**	**-**	**-**	**-**	**89**	**953**	**3847749**	**1108**	**3893253**
Bhilwara	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	953	3847749	953	3847749
Jaipur	2	112	-	-	-	-	++	112	31869	-	-	-	-	-	-	-	-	-	-	112	31869
Karauli	1	-	-	-	-	-	-	-	-	++	-	-	-	-	-	-	-	-	-	-	-
Sikar	2	43	-	-	-	-	-	43	13546	-	-	-	-	-	-	++	89	-	-	43	13635
Telangana	**(1)**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**1290**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1290**
Warangal	(1)	2	-	-	-	-	-	2	1290	-	-	-	-	-	-	-	-	-	-	2	1290

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

Table – 5 (B) : Production of Iron Ore, 2019-20 (P)
(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	**250 (8)**	**3538**	**2996**	**4801**	**10671**	**35326**	**19031**	**76363**	**196800672**	**7881**	**14741**	**10617**	**28503**	**88026**	**18768**	**168536**	**280076494**	**1182**	**4196930**	**246081**	**481074096**
Public Sector	36	116	10	332	2869	14024	9756	27107	70491088	310	711	1452	11498	25934	7237	47142	89484552	-	-	74249	159975640
Private Sector	214 (8)	3422	2986	4469	7802	21302	9275	49256	126309584	7571	14030	9165	17005	62092	11531	121394	190591942	11824	196930	171832	321098456
Andhra Pradesh	**17**	**502**	**-**	**-**	**-**	**-**	**-**	**502**	**393190**	**316**	**-**	**-**	**-**	**-**	**-**	**316**	**189511**	**-**	**-**	**818**	**582701**
Anantapur	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cuddapah	3	409	-	-	-	-	-	409	309312	287	-	-	-	-	-	287	170770	-	-	696	480082
Krishna	1	-	-	-	-	-	-	-	-	++	-	-	-	-	-	++	55	-	-	++	55
Kurnool	11	93	-	-	-	-	-	93	83878	29	-	-	-	-	-	29	18686	-	-	122	102564
Nellore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prakasam	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chhattisgarh	**19**	**192**	**287**	**96**	**577**	**2558**	**8465**	**12175**	**38901080**	**965**	**427**	**625**	**3394**	**9530**	**7608**	**22549**	**61184967**	**-**	**-**	**34724**	**100086047**
Dantewada	6	-	-	6	-	178	8255	8439	34414429	7	27	137	878	8156	6700	15905	52291954	-	-	24344	86706383
Durg	4	46	-	8	409	2297	209	2969	3438919	51	-	-	2045	1374	229	3699	4334459	-	-	6668	7773378
Kanker	6	28	207	66	165	83	1	550	685424	439	338	469	468	-	679	2393	3552239	-	-	2943	4237663
Narayanpur	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rajnandgaon	2	118	80	16	3	-	-	217	362308	468	62	19	3	-	-	552	1006315	-	-	769	1368623
Goa	**31**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
North Goa	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Goa	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jharkhand	**19**	**67**	**360**	**278**	**1423**	**3639**	**1479**	**7246**	**10051725**	**182**	**451**	**499**	**3109**	**14394**	**1007**	**19642**	**18846139**	**-**	**-**	**26888**	**28897864**
Singhbhum (West)	19	67	360	278	1423	3639	1479	7246	10051725	182	451	499	3109	14394	1007	19642	18846139	-	-	26888	28897864
Karnataka	**60**	**701**	**1666**	**1106**	**1725**	**3705**	**347**	**9250**	**24977063**	**2283**	**3624**	**6523**	**1721**	**7374**	**627**	**22152**	**41569302**	**-**	**-**	**31402**	**66546365**
Bagalkot	3	209	1	-	-	-	-	210	406917	64	-	-	-	-	-	64	74018	-	-	274	480935
Ballari	49	433	1291	972	1104	3301	347	7448	20149298	1569	3485	2522	1721	7370	627	17294	34517955	-	-	24742	54667253
Chitradurga	7	59	374	134	621	404	-	1592	4420848	650	139	4001	-	4	-	4794	6977329	-	-	6386	11398177
Tumakuru	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(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	**19 (7)**	**1464**	**2**	**1**	++	-	-	**1467**	**689247**	**1866**	-	-	++	-	-	**1866**	**1040728**	-	-	**3333**	**1729975**
Chhatarpur	1	96	1	-	++	-	-	97	43683	11	-	-	-	-	-	11	5455	-	-	108	49138
Gwalior	1	-	-	-	-	-	-	-	-	74	-	-	-	-	-	74	29670	-	-	74	29670
Jabalpur	16 (7)	1362	-	-	-	-	-	1362	634077	1781	-	-	++	-	-	1781	1005603	-	-	3143	1639680
Sagar	1	6	1	1	-	-	-	8	11487	-	-	-	-	-	-	-	-	-	-	8	11487
Maharashtra	**13**	**41**	**-**	**39**	**13**	**-**	**-**	**93**	**180171**	**598**	**118**	**322**	**-**	**-**	**-**	**1038**	**1100506**	**-**	**-**	**1131**	**1280677**
Chandrapur	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gadchiroli	2	-	-	-	-	-	-	-	8813	-	-	-	-	-	-	-	-	-	-	++	8813
Gondia	3	8	-	-	-	-	-	8	15143	4	-	-	-	-	-	4	2288	-	-	12	17431
Sindhudurg	6	33	-	39	13	-	-	85	156215	594	118	322	-	-	-	1034	1098218	-	-	1119	1254433
Odisha	**63 (1)**	**383**	**681**	**3281**	**6933**	**25424**	**8740**	**45442**	**121557457**	**1671**	**10121**	**2648**	**20279**	**56728**	**952**	**6100973**	**156145292**	**358**	**620182**	**146773**	**278322931**
Keonjhar	36	17	97	993	1260	19192	8061	29620	77277144	923	7596	383	12909	40351	9490	71652	110655090	-	-	101272	187932234
Mayurbhanj	2	42	206	1163	-	303	265	1979	5959646	17	193	55	134	9	9	417	552700	-	-	2396	6512346
Sundargarh	25 (1)	324	378	1125	5673	5929	414	13843	38320667	731	2332	2210	7236	16368	27	28904	44937502	358	620182	43105	83878351
Rajasthan	**9**	**188**	**-**	**-**	**-**	**-**	**-**	**188**	**50739**	++	-	-	-	-	-	++	**49**	**8243576748**		**1012**	**3627536**
Bhilwara	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8243576748		824	3576748
Jaipur	2	148	-	-	-	-	-	148	38416	-	-	-	-	-	-	-	-	-	-	148	38416
Jhunjhunu	2	++	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	++	13
Karauli	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sikar	2	40	++	-	-	-	-	40	12310	++	-	-	-	-	-	++	49	-	-	40	12359

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

Table – 6 : Production of Iron Ore, 2018-19 and 2019-20
(By Frequency Groups)

Production Group (In tonnes)	No. of mines		Production (In '000 tonnes)		Percentage in total production		Cumulative percentage	
	2018-19	2019-20 (P)	2018-19	2019-20 (P)	2018-19	2019-20 (P)	2018-19	2019-20 (P)
Total	**252 (8)**	**250 (8)**	**206494**	**246081**	**100.00**	**100.00**	-	-
Up to 50,000	136 (6)	123 (6)	587	563	0.28	0.23	0.28	0.23
50,001 –100,000	13(1)	16	1048	1262	0.51	0.51	0.79	0.74
100,001 –500,000	36 (1)	40 (2)	9262	11167	4.49	4.54	5.28	5.28
5,00,001 –10,00,000	19	18	14062	14309	6.81	5.81	12.09	11.09
1,000,001–1,500,000	8	11	9797	13558	4.74	5.51	16.83	16.60
15,00,001 –20,00,000	5	8	8677	14052	4.20	5.71	21.03	22.31
20,00,001 and above	35	34	163031	191170	78.97	77.69	100	100

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

Table –7 (A) : Mine-head Closing Stocks of Iron Ore, 2018-19
(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	**8148**	**2112**	**1974**	**1863**	**8532**	**2549**	**25178**	**27768**	**54369**	**8590**	**25431**	**17190**	**4198**	**137546**	**397**	**163121**
Andhra Pradesh	399	14	-	1	-	-	**414**	900	-	-	1	-	-	**901**	-	**1315**
Chhattisgarh	5	22	36	5	465	674	**1207**	374	104	8	330	923	1345	**3084**	-	**4291**
Goa	413	222	46	++	1	-	**682**	707	387	10	13	++	-	**1117**	21	**1820**
Jharkhand	376	651	132	221	231	122	**1733**	1366	36424	356	567	2070	603	**41386**	-	**43119**
Karnataka	4430	471	303	641	896	115	**6856**	1567	617	2616	752	1449	63	**7064**	-	**13920**
Madhya Pradesh	845	15	15	17	-	-	**892**	2626	4	++	-	-	-	**2630**	++	**3522**
Maharashtra	78	39	++	1	++	-	**118**	39	63	3	-	-	-	**105**	-	**223**
Odisha	1452	678	1442	977	6939	1638	**13126**	20177	16770	5597	23768	12748	2187	**81247**	324	**94697**
Rajasthan	149	-	-	-	-	-	**149**	12	-	-	-	-	-	**12**	52	**213**
Telangana	1	++	-	-	-	-	**1**	-	-	-	-	-	-	**-**	-	**1**

++ *Negligible*

Table – 7 (B) : Mine-head Closing Stocks of Iron Ore, 2019-20 (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	**8382**	**1896**	**2152**	**2742**	**8933**	**2736**	**26841**	**28284**	**48773**	**5782**	**14859**	**16858**	**3667**	**118223**	**410**	**145474**
Andhra Pradesh	463	6	-	++	-	-	**469**	1093	-	-	1	-	-	**1094**	-	**1563**
Chhattisgarh	32	27	21	10	172	683	**945**	232	118	6	314	814	1072	**2556**	-	**3501**
Goa	358	211	11	++	1	-	**581**	402	207	10	13	++	-	**632**	21	**1234**
Jharkhand	368	576	128	209	311	256	**1848**	1360	36268	333	755	1867	240	**40823**	-	**42671**
Karnataka	4398	315	308	558	765	83	**6427**	2336	680	899	401	1007	45	**5368**	-	**11795**
Madhya Pradesh	1045	5	10	17	-	-	**1077**	2941	-	4	-	-	-	**2945**	++	**4022**
Maharashtra	49	11	++	2	++	-	**62**	91	84	10	-	-	-	**185**	-	**247**
Odisha	1484	745	1674	1946	7684	1714	**15247**	19817	11416	4520	13375	13170	2310	**64608**	367	**80222**
Rajasthan	184	++	-	-	-	-	**184**	12#	-	-	-	-	-	**12#**	22	**218**
Telangana	1	-	-	-	-	-	**1**	-	-	-	-	-	-	**-**	-	**1**

++ 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^{o}. 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. The State is yet to find a path to resume operations.

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.

The twenty-eight pelletisation plants in the country about which information is available, have a total capacity of 69.620 million tonnes per annum. The JSW Steel Ltd has a manufacturing capacity of 9.2 million tonnes of pellets annually at Vijayanagar. Amba River Coke Limited, a wholly owned subsidiary Company of JSW Steel, has set up a 4 million tpy pellet plant at Dolvi and has produced 3.21 million tonnes of pellet during the FY 2020-21. The pellets produced are primarily supplied to the Dolvi unit of the company. In order

to decrease the facility's requirement of expensive lump iron ore, the JSW Steel Ltd has set up an 8 MTPA pellet plant at Vijayanagar. This has been commissioned and is currently under trial run.

With a strong belief in prudent forward and backward integrations, JSPL established India's largest 9 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 may add another 6 million tpy to its capacity 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 is setting up a 3.0 MTPA Greenfield Integrated Steel Plant at Nagarnar, Bastar District in Chhattisgarh. Construction work for the project is in progress and about 93% of civil work, 90% structural erection, 76% equipment erection have been completed as on 31.3.2019.

NMDC has also 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 2.375 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 capacity and production of pellets and sintering plants is 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 for sale of pig iron has increased from 1.6 million tonnes in 1991-92 to 5.42 million tonnes in 2019-20. Production of pig iron in 2019-20 was 5.42 MT, a decline of 15.5% over that of last year.The Private Sector accounted for 89% of the total production of pig iron (5.42 MT) in the country in 2019-20. 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 82% of the total sponge iron production in the country. 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 has increased from 0.9 million tonnes in 1990-91 to 37.10 million tonnes in 2019-20. 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.or are exported. They are consumed in domestic industries and are 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'.

Coal Washeries

Magnetite ore is used as heavy media in coal washeries. As per the information available in Energy Statistics 2018, there are 18 washeries for coking coal and 34 washeries for non-coking coal with 28.78 million tpy and 98.78 million tpy installed capacity, respectively. Details on coal washeries are provided in the Review on 'Coal & Lignite'.

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, Vanaspati and Glass Industries. The specifications of iron ore consumed by major sponge iron plants are furnished in Table-9.

CONSUMPTION

In 2019-20, about 180.68 million tonnes iron ore that were consumed in various industries like Iron & Steel, Sponge Iron, alloy steel, ferroalloys and cement were slightly higher than 174.551 million tonnes consumed in the preceding year. Iron & Steel including pelletisation (87.57%) and Sponge Iron industries (11.95%) were the major consumers of iron ore and accounted together for over 99.52 % of the consumption. Plantwise consumption of iron ore in steel plants has been furnished in Table-10 and industrywise consumption of iron ore from 2017-18 to 2019-20 has been provided in Table-11.

Table – 8 : Installed Capacity & Production of Pellets and Sinters, 2018-19 & 2019-20 (By Plants)

(In '000 tonnes)

Name & location of plant	Annual installed capacity	Production		Iron ore fines consumed	
		2018-19	2019-20 (P)	2018-19	2019-20 (P)
A) Pellet Plants					
1. Amba River Coke Ltd, (A wholly owned subsdiary co. of JSW Steel Ltd), Dolvi, Maharashtra	4000	1368	1869	2894	1817
2. Atibir Industries Co. Ltd. Unit-II, Bhorandiha, Jharkhand	300	229	155	1011	769
3. Ardent Steel Ltd, Phulj Keonjhar, Odisha	600	NA	NA	NA	NA
4. Arya Iron and Steel Company (AISCO) Barbil, Odisha	1200	803	NA	NA	NA
5. Pellet Sponge Iron Plant BMM Ispat, Karnataka	2400	1696	2040	2248	2448
6. Arcelor Mittal Nippon Steel India, Visakhapatnam, Andhra Pradesh	8000	NA	NA	NA	NA
7. Arcelor Mittal Nippon, Steel India, Paradip Port,Odisha.	6000	NA	NA	NA	NA
8. Godawari Power & Ispat Ltd Siltara, Chhattisgarh	2100	NA	NA	NA	NA
9. Jindal Steel & Power Ltd, Barbil, Odisha	9000	NA	NA	NA	NA
10. Jindal Saw Ltd, Bhilwara, Rajasthan	1500	1415	1380	1350	1367
11. Jindal Saw Ltd, Gujarat	NA	NA	NA	185	211
12. JSW Steel Ltd, Tornagallu, Toranagally, Ballari, Karnataka	9200	7870	8048	NA	17232
13. Jayaswal Neco Industries Ltd, Siltara, Raipur, Chhattisgarh	1200	1200	1128	1834	1902
14. KIOCL Ltd, Panambur, Mangaluru, Karnataka	3500	2238	2375	2173	2367
15. Mandovi Pellets Ltd, Near Borim Bridge, Shiroda, Goa – 403 103	1800	NA	NA	NA	NA

(contd)

Table-8 (contd)

(In '000 tonnes)

Name & location of plant	Annual installed capacity	Production		Iron ore fines consumed	
		2018-19	2019-20 (P)	2018-19	2019-20 (P)
16. Minera Steel & power Private Ltd, Ballari, Karnataka	600	543	599	597	678
17. Monnet Ispat and Energy Raigarh, Chhattisgarh	1200	NA	NA	NA	2018
18. MSP Steel & Power Ltd, Raigarh, Chhattisgarh	900	1007	1092	NA	949
19. NMDC Ltd, Donimalai, Karnataka.	1200	1156	1105	NA	NA
20. Orissa Metalics Private Ltd, Paschim Mednapore, West Bengal	2520	1328	2047	NA	2809
21. Orissa Manganese & Minerals Limited (OMML), Kandra Saraikela Kharsawan, Jharkhand	1200	NA	NA	NA	NA
22. Rashmi Metaliks Ltd, Shyamraipur, Gokulpur, West Midnapore, West Bengal	900	743	559	NA	1508
23. Rexon Strips Ltd, Kumakela, Lathikata Rourkela, Sundargarh, Odisha	300	NA	NA	NA	NA
24. Sarda Energy and Minerals Ltd, Siltara, Mandhar, Raipur, Chhattisgarh	600	600	600	NA	549
25. Shri Bajarang Power & Ispat Ltd, Borjhara, Tilda & Gondwara, Raipur, Chhattisgarh	1400	NA	NA	NA	NA
26. Tata Steel Limited, Jamshedpur	6000	6330	5600	NA	13208
27. Usha Martin Ltd, Usha Alloy & Steel, Division, Jamshedpur	1200	NA	NA	NA	NA
28. Xindia Steels Ltd, Kunikere & Hirebaganal Ginigera, Koppal, Karnataka	800	NA	NA	NA	NA

(contd)

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

Name & location of plant	Annual installed capacity	Production		Iron ore fines consumed	
		2018-19	2019-20 (P)	2018-19	2019-20 (P)
B) Sintering Plant					
1. Atibir Industries Co. Ltd. Unit-II, Bhorandiha, Jharkhand	680	582	415	1011	769
2. Bokaro Steel Plant, Jharkhand	6900	5870	5681	NA	3882
3. Bhilai Steel Plant, Bhilai, Durg, Chhattisgarh.	6334	NA	NA	NA	NA
4. Bhushan Steel Ltd, Dhenkanal, Odisha	6680	4951	4967	4449	4297
5. Durgapur Steel Plant, West Bengal	3009	3374	3299	NA	2531
6. Electrosteel Casting Ltd Khardah, Barrackpore, West Bengal	365	365	363	326	292
7. Electrosteels Ltd, Siyaljori, Jharkhand	2980	1948	2265	NA	1444
8. Gerdau Steel India Ltd, Tadipatri, Anantpur, A.P.	470	NA	NA	NA	NA
9. IISCO Steel Plant, SAIL Burnpur, West Bengal	3880	3277	3709	398	462
10. Jayaswal Necco Industries Ltd, Siltara Growth Centre, Raipur-493 221, Chhattisgarh	729	NA	NA	1834	1902
11. Jindal Steel & Power Ltd, Raigarh, Chhattisgarh	2300	NA	NA	NA	NA
12. Jindal Saw Ltd, Mundra, Gujarat	900	747	708	262	1124
13. JSW Steel Ltd, Tornagallu, Toranagallu, Ballari, Karnataka	12950	13996	12925	NA	17232
14. JSW Steel Ltd, Dolvi Works, Raigad, Maharashtra	5400	4160	4503	4570	5316
15. JSW Steel Ltd Salem works, Mkalipatti, Metturdam, Tamil Nadu	1106	1329	1380	NA	774

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

Name & location of plant	Annual installed capacity	Production		Iron ore fines consumed	
		2018-19	2019-20 (P)	2018-19	2019-20 (P)
16. Jai Balaji Industries Banskopa, West Bengal	608	513	526	546	466
17. Kalyanigerdua Steels Ltd, formerly sjk steel plant, Jambulapadu, Tadipatri, Andhra Pradesh	500	456	437	283	229
18. Kirloskar Ferrous Industries Ltd, Bevinahalli, Koppal, Karnataka.	500	460	455	NA	378
19. KIC Metaliks Ltd, Raturia, Angadpur, Durgapur. West Bengal	336	179	144	NA	115
20. Monnet Ispat and Energy Raigarh, Chhattisgarh	962.3	NA	NA	NA	2018
21. Mukund Ltd, M/s Hospet Steel Ltd, Ginigera, Koppal, Karnataka	500	NA	NA	359	223
22. Neometaliks Ltd, Gopalpur, Durgapur, West Bengal	316	266	290	NA	208
23. Neelachal lspat Nigam Ltd, Kalinga Nagar, Industrial Complex, Duburi-755 026, Distt Jajpur, Odisha.	1710	NA	NA	215	215
24. Rashmi Metaliks Ltd, Shyamraipur, Gokulpur, West Midnapore, West Bengal.	1440	508	515	NA	1508
25. RINL, Visakhapatnam Steel Plant No. -1& 2 , Visakhapatnam, Andhra Pradesh	5256	4240	3590	5317	4787

(contd)

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

Name & location of plant	Annual installed capacity	Production		Iron ore fines consumed	
		2018-19	2019-20 (P)	2018-19	2019-20 (P)
26. RINL, Visakhapatnam Steel Plant No. -3, Andhra Pradesh	3600	NA	NA	NA	NA
27. Rourkela Steel Plant, Odisha	5300	6310	6020	3963	3802
28. SBQ Steel Ltd, Gudur, Nellore, Andhra Pradesh	240	NA	NA	NA	NA
29. Sri Kalahasthi Pipes Ltd, Chitoor, Andhra Pradesh	500	402	425	394	388
30. SLR Metaliks Ltd, Ballari, Karnataka	350	361	361	NA	189
31. Sesa Goa Ltd, Vedanta Ltd, North Goa	1000	NA	NA	NA	NA
32. Sunflag Iron & Steel Co. Ltd, Warrthy, Bhandara, Maharashtra	450	312	429	67	14
33. Tata Steel Ltd, Jamshedpur, Jharkhand	8000	8179	8611	17060	16807
34. Tata Metaliks Ltd, Kharagpur, West Bengal	528	NA	NA	338	329
35. Tata Steel Ltd, Kalingnagar, Odisha	5750	NA	NA	1111	896
36. Usha Martin Ltd (Usha Alloys and Steel Division), Jamshedpur.	715	NA	NA	2312	2312
37. Uttam Galva, Metallics Ltd, Wardha, Maharashtra	887	623	620	724	756
38. Vedanata Ltd. Amona, Goa	1000	NA	NA	NA	NA
39. Value Added business, Amona, Goa	1000	0	0	NA	490

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 : Consumption and Specifications of Iron Ore, 2018-19 and 2019-20 (By Steel Plants)

(In '000 tonnes)

Steel plant	Iron ore consumption				Specifications
	2018-19		2019-20 (P)		
	Lumps	Fines	Lumps	Fines	
Bokaro Steel Plant, Bokaro, Jharkhand	NA	NA	2622	3882	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	NA	NA	1439	2531	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	1137	2698	1098	3173	Lumps: Fe - 62.86%, SiO_2 - 2.56%, Al_2O_3 - 2.56% (max.), Size: 10-40 mm
Bhilai Steel Plant, Chhattisgarh	NA	NA	NA	NA	-
Rourkela Steel Plant SAIL, Rourkela,Odisha	2428	3963	2419	3802	-

(contd)

Table-10 (concld) (In '000 tonnes)

Steel plant	Iron ore consumption				Specifications
	2018-19		2019-20 (P)		
	Lumps	Fines	Lumps	Fines	
JSW Steel Ltd Dolvi Works Raigad, Maharashtra.	296	4570	283	5316	
JSW Steel Ltd Tornagallu, Sandur, Ballari Karnataka	NA	NA	14052	17232	-
JSW Steel Ltd Salem works, Mkalipatti, Metturdam, Tamil Nadu	1003	4156	755	774	
Tata Steel Limited, Jamshedpur	NA	NA	3598	13208	
RINL Vishakhapatnam Steel Plant, Andhra Pradesh	3547	5317	3117	4787	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 Estimated Consumption* of Iron Ore@ 2017-18 to 2019-20 (By Industries)

(In tonnes)

Industry	2017-18	2018-19 (R)	2019-20 (P)
All Industries	**159575800(308)**	**174551400(343)**	**180684900(330)**
Cement	826400	1079700	824800
Iron & steel **	144129900	154365100	158231600
Sponge iron	14603200	19087700	21606200
Others (electrode,foundry, paint, chemical, Pulverising & refractory)	16300	18900	22300

Figures rounded off
**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.
*** including pelletisation, Alloy steel & Ferroalloys.*
() No. of plant reported/estimated.

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 84 billion tonnes. The world reserves of crude iron ore and iron content by principal countries are furnished in Table - 12.

In 2019, the world production of iron ore was 3,040 million tonnes as against 2,945 million tonnes in the previous year. Australia 919 million tonnes (30.23%), China 844 million tonnes(27.76%), Brazil 397 million tonnes (13.06%), India 243 million tonnes (7.99%), Russia 98 million tonnes (3.22%), Iran 93 million tonnes(3.06%), South Africa 72 million tonnes(2.37%), Ukraine 63 million tonnes (2.07%) and Canada 59 million tonnes(1.94%) were the principal producers. These nine countries accounted for about 91.7 % of the world production of iron ore and remaining 8.30 %was contributedby the 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., the 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**	**84000**
Australia [(a)]	50000	24000
Brazil	34000	15000
Canada	6000	2300
China	20000	6900
India*	5500	3400
Iran	2700	1500
Kazakhstan	2500	900
Peru	NA	1500
Russia	25000	14000
South Africa	1000	640
Sweden	1300	600
Ukraine[(b)]	6500	2300
USA	3000	1000
Other countries	18000	9500

Source: *USGS, Mineral Commodity Summaries, 2021.*

(a) : For Australia Joint Ore Reserves Committee compliant reserves were about 23 billion tonnes for crude ore and 11 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 1.4.2015, India's reserves/ resources of Iron ore (Haematite) and Iron ore (Magnetite) were estimated at 22,487 million tonnes and 10,789 million tonnes respectively.*

NA - Not available.

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

(In million tonnes)

Country	2017	2018	2019 (P)
World : Total (rounded off)	**3360**	**2945**	**3040**
Australia	885	908	919
Brazil	454	450	397
Canada[a]	52	52	59
China	1229	763	844
India[b]*	201	206	243
Iran[c]	76	93	93[e]
Russia	95	96	98
South Africa[d]	75	74	72
Ukraine	61	61	63
Other countries	233	241	251

Source: *BGS World Mineral Production, 2015-2019.*

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 2017-18, 2018-19 and 2019-20 was 201.43 million tonnes 206.49 million tonnes and 246.08 million tonnes respectively.*

FOREIGN TRADE

Exports

Exports of iron ore increased sharply more than doubled to 36.62 million tonnes in 2019-20 from 16.15 million tonnes in the previous year. In terms of value the iron ore exports increased sharply more than two times to `₹ 18,609 crore in 2019-20 from `₹ 9,263 crore in 2018-19. Exports were mainly to China (86%), Japan (5 %) & Republic of Korea (3%), Oman & Turkey (1% each) and the remaining 4% share of the exports was contributed by Malaysia, UK , UAE , Qatar, Italy etc. The total exports of iron ore in 2019-20, in terms of quantity comprised iron ore fines 22.37 million tonnes(61%), iron ore pellets 12.61 million tonnes(34%), iron ore lumps 1.48 million tonnes(4%) and negligible quantity of iron ore non-agglomerated concentrate and iron ore pyrites. (Tables- 14 to 19).

Imports

Unlike exports, imports of iron ore decreased drastically by 90 % to 1.25 million tonnes in 2019-20 from 12.81 million tonnes in the previous year. In terms of value, the iron ore imports decreased drastically by 84% to `₹ 941 crore in 2019-20 from `₹ 5,914 crore in preceding year. Imports of iron ore were from South Africa (44%), Brazil (24%), Australia (14%) ,Canada (10%), Iran & Philippines (4% each) and negligible amount from other countries. The total imports in 2019-20 comprised iron ore lumps (44%), non-agglomerated concentrates (34%), iron ore fines (18%), iron ore pellets (4%), and negligible quantity of iron ore pyrites (Tables-20 to 25).

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	**16150**	**92626091**	**36624**	**186092708**
China	12103	67037592	31605	151430365
Japan	1160	6053842	1956	12842148
Korea, Rep. of	1055	7438133	1016	7187094
Oman	253	1745800	531	3927902
Turkey	67	468827	433	3333516
Malaysia	344	1573321	266	1678942
UK	372	2687972	184	1463310
UAE	++	6685	78	634624
Qatar	-	-	54	566726
Italy	++	2967	59	441098
Other countries	796	5610953	442	2586984

Figures rounded off

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (`₹'000)	Qty ('000 t)	Value (`₹'000)
All Countries	**831**	**3138921**	**1479**	**8779975**
Japan	430	2503803	935	6755427
China	378	601455	520	1991319
Saudi Arabia	-	-	23	32558
Nepal	1	1769	1	666
Germany	-	-	++	5
Malaysia	22	31895	-	-

Figures rounded off

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (`₹'000)	Qty ('000 t)	Value (`₹'000)
All Countries	**5905**	**16112897**	**22373**	**83422737**
China	4763	12154206	20702	73961561
Japan	565	2129168	919	5486160
Korea, Rep. of	301	1287769	581	3597258
Malaysia	163	397264	48	149165
Nepal	75	98194	75	127673
UAE	-	-	22	62982
Saudi Arabia	-	-	27	37938
Oman	39	46296	++	1

Figures rounded off

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (`₹'000)	Qty ('000 t)	Value (`₹'000)
All Countries	**0.90**	**28634**	**0.68**	**25051**
Netherlands	0.18	5772	0.10	4187
Bangladesh	0.14	5097	0.11	3880
Japan	0.02	791	0.09	3071
UAE	0.19	6684	0.09	2777
Saudi Arabia	0.08	2862	0.05	2501
Australia	-	-	0.06	1910
Thailand	-	-	0.02	1270
Ghana	0.02	735	0.03	870
Malaysia	0.01	137	0.03	772
UK	-	-	0.02	679
Other countries	0.27	6554	0.08	3133

Figures rounded off

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (`₹'000)	Qty ('000 t)	Value (`₹'000)
All Countries	**49**	**167775**	**153**	**559743**
China	48	166308	152	557777
Nepal	1	1117	1	1904
Austria	-	-	++	29
USA	++	5	++	28
Slovenia	-	-	++	3
Brazil	-	-	++	1
Turkey	-	-	++	-
Thailand	-	-	++	-
Indonesia	++	251	-	-
Nigeria	++	33	-	-
Other countries	++	62	++	++

Figures rounded off

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (`₹'000)	Qty ('000 t)	Value (`₹'000)
All Countries	**9364**	**73177865**	**12618**	**93305203**
China	6914	54115114	10232	74919708
Oman	214	1699504	531	3927820
Korea, Rep. of	754	6150363	435	3589369
Turkey	67	468827	433	3333516
Malaysia	159	1144025	218	1529005
UK	372	2687972	184	1462631
Japan	165	1420080	102	597489
UAE	++	++	56	568865
Qatar	-	-	54	566726
Italy	-	-	59	441098
Other countries	719	5491979	315	2368977

Figures rounded off

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (`₹'000)	Qty ('000 t)	Value (`₹'000)
All Countries	**12808**	**59136712**	**1246**	**9409772**
South Africa	2653	17602143	543	4528314
Brazil	1873	10467345	301	2290546
Australia	7217	21451196	171	874461
Canada	164	1079914	119	747778
Iran	++	591	54	438138
Philippines	-	-	52	416840
Turkey	2	30862	2	23867
Croatia	-	-	2	19967
UAE	-	-	1	15556
Sweden	++	11192	++	14484
Other countries	899	8493469	2	39822

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (`₹'000)	Qty ('000 t)	Value (`₹'000)
All Countries	**533**	**3533499**	**421**	**3063618**
Brazil	107	856910	301	2290030
Canada	164	1079914	119	747778
Sweden	++	11192	++	13251
Netherlands	++	5700	++	6482
Bahrain	-	-	++	3838
France	-	-	++	1160
Belgium	-	-	++	384
USA	++	195	++	314
Senegal	-	-	++	128
UAE	-	-	++	118
Other countries	262	1579587	++	135

Figures rounded off

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (`₹'000)	Qty ('000 t)	Value (`₹'000)
All Countries	**640**	**6832112**	**54**	**438140**
Iran	-	-	54	438138
Japan	-	-	++	2
Bahrain Is	640	6832096	-	-
China	++	16	-	-

Figures rounded off

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (`₹'000)	Qty ('000 t)	Value (`₹'000)
All Countries	**4**	**58526**	**6**	**86330**
Turkey	2	30862	2	23867
Croatia	-	-	2	19967
UAE	-	-	1	15438
China	++	9423	++	10240
Finland	++	3425	++	7067
Italy	++	5571	++	5738
Serbia	++	3794	++	2940
Russia	-	-	++	579
Sweden	-	-	++	409
USA	++	77	++	81
Other countries	1	5374	++	4

Figures rounded off

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (`₹'000)	Qty ('000 t)	Value (`₹'000)
All Countries	**3196**	**19735798**	**543**	**4530383**
South Africa	2275	15528518	543	4528314
Sweden	-	-	++	824
Belgium	-	-	++	715
Brazil	-	-	++	515
Germany	++	229	++	14
Australia	921	4206460	-	-
Iran	++	591	-	-

Figures rounded off

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (`₹'000)	Qty ('000 t)	Value (`₹'000)
All Countries	**8436**	**28976777**	**223**	**1291301**
Australia	6296	17244508	171	874461
Philippines	-	-	52	416840
Brazil	1766	9610435	-	-
South Africa	323	1712608	-	-
Malaysia	51	409002	-	-
UK	++	224	-	-

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). In order to conserve iron ore resources of the country for long-term domestic value addition, export duty on iron ore for both lumps and fines varieties of 58% Fe content and above (except pellets) is @ 30% ad valorem.

The Ministry of Steel under Government of India has recently 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. 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.