

OCHRE



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OCHRE

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**GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES**

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Ochre is a natural earth pigment containing hydrated iron oxide, which ranges in colour from yellow to deep orange or brown. The pigmentary quality is mainly due to the presence of iron oxide; hydrated iron oxide imparts yellow colour and anhydrous iron oxide red. A mixture of ferrous and ferric oxide imparts mainly brown besides other shades. Ochres are non-toxic and can be used to make paints that dry quickly and cover surfaces thoroughly. Occurrences of ochre have been reported from several states in the country.

RESOURCES

Deposits of red ochre are found chiefly in West Godavari and Visakhapatnam districts in Andhra Pradesh; Banaskantha district in Gujarat; Bidar district in Karnataka; Satna and Gwalior districts in Madhya Pradesh; Nagpur district in Maharashtra; and Chittorgarh and Udaipur districts in Rajasthan. Deposits of yellow ochre are found in Guntur and Kurnool districts in Andhra Pradesh; Jabalpur, Mandla, Satna and Shahdol districts in Madhya Pradesh and Nagpur district in Maharashtra.

The total resources of ochre as on 1.4.2010 as per the UNFC system, are estimated at 144.26 million tonnes. Out of these resources, about 54.94 million tonnes are reserves and 89.31 million tonnes are remaining resources. Of the total, about 87% resources are of red ochre, 11% of yellow ochre and remaining 2% of grades "not-known". About 81% resources are concentrated in Rajasthan, followed by Andhra Pradesh 8%, Madhya Pradesh 7% and Gujarat about 2%. The remaining 2% resources are located in Karnataka, Maharashtra, Jharkhand and Uttar Pradesh (Table - 1).

EXPLORATION & DEVELOPMENT

DMG Rajasthan mapped some pockets of red and yellow ochre during exploration of limestone near village Meena Ki Dhani.

PRODUCTION, STOCKS & PRICES

The production of ochre at 1.35 million tonnes in 2011-12 increased by about 11% as compared to that in the previous year.

There were 35 reporting mines in 2011-12 as against 30 in the previous year. Besides, the production of ochre was also reported as an associated mineral from 17 mines. Six principal producers accounted for 72% of the total production during the year. The entire production of ochre was reported from private sector in both years.

Rajasthan continued to be the leading producing State of ochre, contributing 93% of the total production in 2011-12 followed by Andhra Pradesh 4%, Madhya Pradesh 3% and remaining minor production was contributed by Gujarat & Karnataka. (Tables- 2 to 5).

Mine-head stocks of ochre at the end of 2011-12 were 406 thousand tonnes as against 191 thousand tonnes at the beginning of the year (Table- 6).

The average daily employment of labour strength in 2011-12 was 434 as against 402 in the previous year. Domestic prices of ochre are furnished in the General Review on Prices.

MINING & PROCESSING

Ochre is worked by shallow open-pit mining. In certain areas, it is also worked by underground method of board-and-pillar. Red and yellow ochres occur separately in different bands, depending upon the hydration either in the same mine or in different mines. The run-of-mine contains gritty matter which is removed by levigation & also by hand sorting wherever possible.

**Table – 1 : Reserves/Resources of Ochre as on 1.4.2010
(By Grades/States)**

	Reserves				Remaining resources				Total resources (A+B)				
	Proved	Probable	Total	Feasibility	Pre-feasibility	Measured	Indicated	Inferred		Reconnaissance	Total		
	STD111	STD121	STD122	STD211	STD221	STD331	STD332	STD333		STD334	(B)		
All India : Total	39863403	683093	14395680	54942176	15897677	13232482	21008598	2477593	3232246	32701243	769250	89319089	144261265
By Grades													
Red Ochre	37974003	192682	13661485	51828170	15694029	12293432	18915924	1840981	927381	23070808	769250	73511805	125339975
Yellow Ochre	1654547	457712	687865	2800124	17680	758567	1682025	596612	2218504	8501906	-	13775294	16575418
Not-known	234853	32699	46330	313882	185968	180483	410649	40000	86361	1128529	-	2031990	2345872
By States													
Andhra Pradesh	1692839	344121	631277	2668237	-	97810	1199762	347681	-	6569575	-	8214828	10883065
Gujarat	12243	32699	65047	109989	-	-	26520	6971	6210	2906608	-	2946309	3056298
Jharkhand	63695	-	4361	68056	-	-	-	-	147039	-	-	147039	215095
Karnataka	-	-	-	-	-	-	1766367	-	-	-	20000	1786367	1786367
Madhya Pradesh	486269	128178	41027	655474	253245	1549706	1094108	267721	2141616	3732142	749250	9787788	10443262
Maharashtra	22260	-	16000	38260	17680	38080	100980	6010	6010	286000	-	454760	493020
Rajasthan	37586097	178095	13637968	51402160	15626752	11546886	16820861	1824210	896371	19196918	-	65911998	117314158
Uttar Pradesh	-	-	-	-	-	-	-	25000	35000	10000	-	70000	70000

Figures rounded off.

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Table – 2 : Principal Producers of Ochre, 2011-12

Name & address of producer	Location of mine	
	State	District
*Mohd. Sherkhan Pathan, P. O. Sawa-312 613, Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
*Mohammed Sayeed Khan, M/s Popular Khanij, Post Sawa-312 613, Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
*Sh.Sajid Ali New Abadi, Kanoj Road, Post: Sawa-312 613, Taluka & Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
Piyush Sharda, Village: Nimbahera, Near Novelty cinema, Tah. & Post: Nimbahera, Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
Star minerals , Post: Sawa-312 613, Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
*Bhagwan Swaroop Mandowara C/o R.B.Mining Co.,Gudda, P.O.Mandal-311 403, Dist.Bhilwara, Rajasthan	Rajasthan	Bhilwara

* Producing ochre as an associated mineral.

**Table – 3 : Production of Ochre, 2009-10 to 2011-12
(By States)**

(Qty in tonnes; value in ₹'000)

State	2009-10		2010-11		2011-12(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	1258207	226881	1218261	240374	1352812	217588
Andhra Pradesh	34093	4690	39376	6194	47407	6607
Gujarat	649	65	2719	299	5275	580
Jharkhand	-	-	1200	205	-	-
Karnataka	4156	4862	34157	29063	1126	5067
Madhya Pradesh	39201	4990	44897	5593	35060	4397
Rajasthan	1180108	212274	1095912	199020	1263944	200937

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**Table – 4: Production of Ochre, 2010-11 and 2011-12
(By Sector/States/Districts)**

(Qty in tonnes; value in ₹'000)

State/District	2010-11			2011-12(P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India	30(14)	1218261	240374	35(17)	1352812	217588
Private sector	30(14)	1218261	240374	35(17)	1352812	217588
Andhra Pradesh	3(2)	39376	6194	5(3)	47407	6607
Anantpur	-	-	-	1	3665	897
Godawari West	(1)	23750	3848	(1)	25078	4063
Guntur	-	-	-	(1)	1702	85
Kurnool	3(1)	15626	2346	4(1)	16962	1562
Gujarat	1	2719	299	1	5275	580
Patan	1	2719	299	1	5275	580
Jharkhand	1	1200	205	-	-	-
Singhbhum (West)	1	1200	205	-	-	-
Karnataka	1(3)	34157	29063	(1)	1126	5067
Bellary	1(3)	34157	29063	(1)	1126	5067
Madhya Pradesh	13(1)	44897	5593	13(2)	35060	4397
Jabalpur	2	14385	2527	3	1033	155
Katni	-	-	-	(1)	855	85
Rewa	1	250	20	-	-	-
Satna	9(1)	28061	2826	9(1)	31672	4007
Umaria	1	2201	220	1	1500	150
Rajasthan	11(8)	1095912	199020	16(11)	1263944	200937
Bharatpur	-	-	-	1	360	65
Bhilwara	-	-	-	1(2)	63317	13979
Bikaner	(2)	12802	2128	(2)	16542	1320
Bundi	-	-	-	(1)	6729	805
Chittorgarh	8(5)	954999	182818	8(5)	889349	158515
Pratapgarh	1	58349	4373	2	174961	11458
Sikar	-	-	-	1	19750	2765
Udaipur	2(1)	69762	9701	3(1)	92936	12030

Figures in parentheses indicate number of associated mines.

**Table – 5 : Production of Ochre, 2010-11 and 2011-12 (P)
(By Frequency Groups)**

(Qty in tonnes)

Production group	No. of mines		Production for the groups		Percentage in total production		Cumulative percentage	
	2010-11	2011-12	2010-11	2011-12	2010-11	2011-12	2010-11	2011-12
All Groups	30(14)	35(17)	1218261	1352812	100.00	100.00	-	-
Up to 5000	17(5)	22(6)	44607	56639	3.66	4.19	3.66	4.19
5001 to 10000	4(1)	3(1)	37742	27037	3.10	2.00	6.76	6.19
10001 to 20000	2(2)	3(3)	56145	91908	4.61	6.79	11.37	12.98
20001 to 30000	3(1)	3(2)	109599	124767	9.00	9.22	20.37	22.20
30001 & above	4(5)	4(5)	970168	1052461	79.63	77.80	100.00	100.00

Figures in parentheses indicate number of associated mines.

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CONSUMPTION

Reported consumption of ochre in 2011-12 in the organised sector was estimated at 681 thousand tonnes of which cement industry alone consumed about 97%. The remaining consumption was together shared by ceramic, foundry, glass, paint and paper industries. A sizeable quantity is believed to have been consumed by small-scale units as well as cottage industries. However, consumption data in this sector are not available (Table-7).

Ochre is used in colour - washes, distempers, oil paints, lacquers, primers and also for imparting colour to paper and cement. It dominates the market because of its cheapness, abundance in occurrence and good pigmentary quality.

At present, synthetic ferric oxide and other pigments are manufactured extensively and these possess better pigmentary properties

than natural ochre. Synthetic products are fast replacing the natural ones, particularly because of quality.

**Table – 6 : Mine-head Stocks of Ochre
2011-12(P)
(By States)**

(In tonnes)		
State	At the beginning of the year	At the end of the year
India	191215	405926
Andhra Pradesh	4622	8752
Chhattisgarh	6180	-
Gujarat	1085	887
Jharkhand	640	973
Karnataka	32978	19162
Madhya Pradesh	51935	75462
Rajasthan	93775	300690

**Table – 7 : Reported Consumption of Ochre, 2009-10 to 2011-12
(By Industries)**

(In tonnes)			
Industry	2009-10	2010-11(R)	2011-12(P)
All Industries	382600	614000	681000
Cement	372700 (7)	601700 (10)	658300 (10)
Ceramic	8900 (1)	8900 (1)	8900 (1)
Glass	++ (2)	++ (2)	++ (2)
Paint	1000 (10)	3400 (15)	13800(15)

Figures rounded off.

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

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

Note: Data on consumption of ochre (including oxide) relate to units reporting from organised sector only. The data do not include consumption in small-scale units, cottage industries, colour washing, construction industry, etc.

FOREIGN TRADE

Exports

Exports of ochre decreased to 7,741 tonnes in 2011-12 from 9,275 tonnes in the previous year. Out of total exports in 2011-12, exports of earth colours were 5,997 tonnes, red oxide 1,393 tonnes, persian red 55 tonnes and yellow ochre 296 tonnes. Exports were mainly to Philippines (24%), Saudi Arabia (18%) and UAE (9%). Exports of earth clay in 2011-12 were 4,498 tonnes compared to 2,195 tonnes in the previous year. Exports were mainly to Saudi Arabia, UAE and Sri Lanka (Tables - 8 to 13).

Imports

Imports of ochre increased to 1,359 tonnes in 2011-12 from 1,324 tonnes in the previous year. Out of total imports in 2011-12, imports of earth colours were 554 tonnes, red oxide 769 tonnes, Persian red 31 tonnes and yellow ochre 5 tonnes. Imports of ochre were mainly from China (40%), USA(30%) & Germany (8%). Imports of earth clay were 65 tonnes in 2011-12 as against 83 tonnes in the previous year. The imports were mainly from Cyprus (Tables - 14 to 19).

**Table – 8 : Exports of Ochre : Total
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	9275	115522	7741	126359
Pakistan	25	292	21	20185
Saudi Arabia	1364	14408	1367	15975
Philippines	2417	14100	1873	13470
UAE	617	7859	710	9558
Italy	12	1447	79	6049
Thailand	395	5587	357	5250
Nepal	86	2755	148	5145
Kenya	192	5129	337	4134
China P Rp	182	2630	230	3930
Malaysia	213	3691	193	3562
Other countries	3772	57624	2426	39101

**Table – 9 : Exports of Ochre: Earth Colours
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	7526	76202	5997	63390
Philippines	2382	13773	1872	13391
Saudi Arabia	831	8212	874	9143
UAE	386	4564	345	4849
Thailand	392	4570	331	4168
China P Rp	182	2630	230	3930
Indonesia	276	2696	230	2654
Korea Rp	666	11284	126	2177
Germany	211	2990	145	2137
Turkey	221	3487	110	2084
Taiwan	302	4738	100	1669
Other countries	1677	17258	1634	17188

**Table – 10 : Exports of Ochre: Yellow Ochre
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	130	3989	296	7228
Saudi Arabia	5	221	66	2072
Spain	8	114	31	964
Togo	-	-	8	804
USA	26	595	33	672
Germany	-	-	40	616
Nigeria	-	-	10	545
Ethiopia	3	423	46	403
Denmark	-	-	20	287
Nepal	1	139	1	177
Tanzania Rep.	11	932	20	156
Other countries	76	1565	21	532

**Table – 11 : Exports of Persian Red
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	14	1626	55	5750
Italy	12	1447	55	5750
Other countries	2	179	-	-

**Table –12 : Exports of Ochre: Red Oxide
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	1605	33705	1393	49991
Pakistan	25	292	21	20185
Saudi Arabia	528	5975	427	4760
Nepal	49	2083	67	4695
UAE	229	3075	359	4603
Kenya	90	4226	63	2451
Malaysia	150	2556	110	1957
Uganda	34	2524	20	1615
Guinea	57	722	96	1410
Liberia	-	-	23	1215
Djibouti	30	1126	23	1146
Other countries	413	11126	184	5954

**Table – 13 : Exports of Earth Clay
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	2195	12667	4498	68972
Saudi Arabia	1357	6713	3067	38441
Indonesia	-	-	67	7045
UAE	241	1002	239	6310
USA	38	1125	157	4705
Italy	-	-	101	3968
Spain	-	-	97	2817
Israel	16	297	208	1251
Oman	32	235	90	828
Netherland	-	-	21	768
Sri Lanka	12	61	248	553
Other countries	499	3234	203	2286

**Table – 14 : Imports of Ochre: Total
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	1324	141001	1359	66315
China	203	18760	548	18549
USA	102	10369	403	15982
Germany	71	6100	113	9416
Thailand	357	40057	39	4900
Philippines	-	-	6	3027
Switzerland	1	734	2	2015
Malaysia	-	-	25	1699
Egypt A Rp	-	-	100	1497
France	-	-	22	1219
Unspecified	-	-	23	2712
Other countries	590	64981	78	5299

**Table – 15 : Imports of Ochre: Earth Colours
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	50	2404	554	7960
China	50	2140	406	4906
Egypt A Rp	-	-	100	1497
Oman	-	-	15	790
Malaysia	-	-	16	516
Belgium	-	-	16	231
Singapore	-	-	1	15
France	-	-	++	4
Other countries	++	264	++	1

**Table – 16 : Imports of Ochre: Yellow Ochre
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	53	6733	5	1820
Italy	6	1438	3	798
Germany	++	343	++	599
Switzerland	-	-	++	250
Singapore	-	-	1	131
USA	++	8	1	32
Poland	-	-	++	8
Other countries	47	4944	++	2

**Table – 17 : Imports of Persian Red
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	135	15796	31	6460
Philippines	-	-	6	3027
Thailand	-	-	18	2351
Indonesia	86	9678	6	768
China	49	5392	1	191
USA	++	726	++	117
Canada	-	-	++	6
Other countries	-	-	-	-

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**Table – 18 : Imports of Red Oxide
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	1086	116068	769	50075
USA	102	9381	402	15833
China	62	7260	141	13451
Germany	71	5745	113	8817
Thailand	352	39082	21	2548
Switzerland	1	734	2	1765
France	-	-	22	1216
Malaysia	-	-	9	1184
Korea Rp	-	-	4	956
UK	-	-	7	610
Unspecified	-	-	23	2712
Other countries	498	53866	25	983

**Table – 19 : Imports of Earth Clay
(By Countries)**

Country	2010-11		2011-12	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	83	4275	65	4751
Germany	10	2083	15	1646
USA	-	-	2	1321
Korea Rp	-	-	18	827
Cyprus	-	-	20	563
Japan	-	-	10	394
Other Countries	73	2192	-	-