

60 Ochre

Natural pigments occurring in various colours like yellow, red, brown and white are named earth colours or ochres. 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. 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 1.4.2005 as per the UNFC system, are estimated at 93.4 million tonnes. Out of these resources, about 47.9 million tonnes are reserves. About 45.5 million tonnes are remaining resources. Of the total, about 79% are of red ochre, 18% of yellow ochre and remaining 3% of grades 'not_known'. About 71% resources are concentrated in Rajasthan, followed by Andhra Pradesh 12%, Madhya Pradesh 11% and Gujarat about 3%. The remaining 3% resources are located in Karnataka, Maharashtra, Jharkhand and Uttar Pradesh (Table - 1).

EXPLORATION & DEVELOPMENT

During 2009-10, DMG, Rajasthan carried out exploration for ochre and other minerals by way of mapping 2 sq km area on 1:10000 scale near village Ghatri & Vallabgarh, Teh.Weir,district Bharatpur. The DMG collected 33 samples for analysis and estimated 2.68 lakh tonnes resources of red ochre.

PRODUCTION, STOCKS & PRICES

The production of ochre at 1.02 million tonnes in 2009-10 increased by about 34% as compared to that in the previous year.

There were 20 reporting mines in 2009-10 as against 23 in the previous year. Besides, the production of ochre was also reported as an associated mineral from 10 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 2009-10 followed by Andhra Pradesh & Madhya Pradesh 3 % each and Gujarat & Karnataka together share remaining one percent (Tables - 2 to 5).

Mine-head stocks of ochre at the end of the year 2009-10 were 161 thousand tonnes as against 112 thousand tonnes at the beginning of the year (Table - 6).

The average daily employment of labour in 2009-10 was 261 as against 258 in the previous year. Domestic prices of ochre are furnished in the General Review on Prices.

**Table – 1 : Reserves/Resources of Ochre as on 1.4.2005
(By Grades/States)**

Grade/State	Reserves			Remaining resources					Total resources (A+B)			
	Proved STD111	Probable STD121 STD122	Total (A)	Feasibility STD211	Pre-feasibility STD221 STD222	Measured STD331	Indicated STD332	Inferred STD333		Reconnaissance STD334	Total (B)	
All India : Total	25747479	3926955 18193423	47867858	856596	1433728	15329242	669393	3085333	23449894	749250	45573436	93441294
By Grades												
Red ochre	22063770	2233361 13065122	37362253	856596	1324741	15247275	86971	907381	17423718	749250	36595932	73958185
Yellow ochre	3581506	1465390 4662973	9709869	-	108987	81967	423087	2071465	4180102	-	6865608	16575477
Not-known	102203	228204 465328	795736	-	-	-	159335	106487	1846074	-	2111896	2907632
By States												
Andhra Pradesh	3211035	926815 4174784	8312634	-	-	-	5000	-	2641348	-	2646348	10958982
Gujarat	14385	33209 65047	112641	-	-	26520	6971	6210	2906608	-	2946309	3058950
Jharkhand	220943	- 12231	233174	-	-	-	-	-	9037	-	9037	242211
Karnataka	487731	- 326100	813831	-	-	-	-	-	952620	-	952620	1766451
Madhya Pradesh	390370	1578522 815741	2784634	-	108987	225967	436877	2085255	3772380	749250	7378716	10163350
Maharashtra	39940	38080 116980	195000	-	-	-	6010	6010	286000	-	298020	493020
Rajasthan	21383075	1350329 12682540	35415944	856596	1324741	15076755	189535	952858	12871901	-	31272386	66688330
Uttar Pradesh	-	- -	-	-	-	-	25000	35000	10000	-	70000	70000

Figures rounded off.

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Table – 2 : Principal Producers of Ochre, 2009-10

Name & address of producer	Location of mine	
	State	District
*Mohd. Sherkhan Pathan P. O. Sawa, Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
Mohammed Sayeed Khan M/s Popular Khanij, Sawa-312 613, Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
Smt. Tamanna Begum W/o Sherkhan, Post: Sawa, Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
Mohammed Saeed Khan At Rani Khara Gate, Post Nimbahera-312 601, Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
Piyush Sharda Village:Nimbahera, Post:Nimbahera, Dist. Chhittorgarh, Rajasthan.	Rajasthan	Chittorgarh
Suresh Prakash Sharda Near Novelty Cinema, Nimbahera, Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh

* Producing ochre as an associated mineral.

**Table – 3 : Production of Ochre, 2007-08 to 2009-10
(By States)**

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

State	2007-08		2008-09		2009-10(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	1233221	203900	766382	70694	1023183	95441
Andhra Pradesh	24764	1253	25227	2741	32523	4390
Gujarat	420	42	280	28	650	65
Jharkhand	187	35	–	–	–	–
Karnataka	23954	2816	777	113	2700	231
Madhya Pradesh	39260	6983	17923	1741	33542	3360
Rajasthan	1144636	192771	722175	66071	953768	87395

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**Table – 4: Production of Ochre, 2008-09 and 2009-10
(By Sector/States/Districts)**

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

State/District	2008-09			2009-10(P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India	23(8)	766382	70694	20(10)	1023183	95441
Private sector	23(8)	766382	70694	20(10)	1023183	95441
Andhra Pradesh	4(1)	25227	2741	3(1)	32523	4390
Godawari West	(1)	11500	1828	(1)	22400	3591
Kurnool	4	13727	913	3	10123	799
Gujarat	1	280	28	1	650	65
Patan	1	280	28	1	650	65
Karnataka	(1)	777	113	(1)	2700	231
Bellary	(1)	777	113	(1)	2700	231
Madhya Pradesh	8(1)	17923	1741	7(2)	33542	3360
Rewa	1	1850	148	1(1)	1400	112
Satna	6(1)	15073	1493	5(1)	30060	2936
Umaria	1	1000	100	1	2082	312
Rajasthan	10(5)	722175	66071	9(6)	953768	87395
Bhilwara	(1)	6681	668	-	-	-
Bikaner	(1)	18298	1830	(2)	23034	3521
Chittorgarh	8(3)	667215	60701	7(2)	906917	81730
Udaipur	2	29981	2872	2(2)	23817	2144

**Table – 5 : Production of Ochre, 2008-09 and 2009-10 (P)
(By Frequency Groups)**

(Qty. in tonnes)

Production group	No. of mines		Production for the group		Percentage in total production		Cumulative percentage	
	2008-09	2009-10	2008-09	2009-10	2008-09	2009-10	2008-09	2009-10
All Groups	23(8)	20(10)	766382	1023183	100.00	100.00	-	-
Up to 500	1	-	280	-	0.04	0.00	0.04	0.00
501 to 1000	1(1)	2	1777	1235	0.23	0.12	0.27	0.12
1001 to 2000	4(2)	3(2)	9149	6270	1.19	0.61	1.46	0.73
2001 to 3000	2	2	4706	4511	0.61	0.44	2.07	1.17
3001 to 5000	2	2(1)	7523	12085	0.98	1.18	3.05	2.35
5001 & above	13(5)	11(7)	742947	999082	96.95	97.65	100	100

Figures in parentheses indicate number of associated mines.

**Table – 6 : Mine-head Stocks of Ochre
2009-10(P)
(By States)**

State	(In tonnes)	
	At the beginning of the year	At the end of the year
India	112426	160806
Andhra Pradesh	5735	2179
Chhattisgarh	6180	6180
Gujarat	317	344
Jharkhand	291	140
Karnataka	11320	18342
Madhya Pradesh	20602	19823
Rajasthan	67981	113798

MINING & PROCESSING

Ochre is worked by shallow open-pit mining. In certain areas, it is worked underground by board- and-pillar method. 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.

CONSUMPTION

Reported consumption of ochre in 2009-10 in the organised sector was estimated at 382,800 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 – 7 : Reported Consumption of Ochre, 2007-08 to 2009-10
(By Industries)**

Industry	(In tonnes)		
	2007-08	2008-09(R)	2009-10(P)
All Industries	449900	297500	382800
Cement	439800 (7)	287400 (7)	372700 (7)
Ceramic	8900 (1)	8900 (1)	8900 (1)
Glass	++ (2)	++ (2)	++ (2)
Paint	1200(12)	1200 (12)	1200(12)
Paper	++ (1)	++ (1)	++ (1)

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

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 8,661 tonnes in 2009-10 from 12,828 tonnes in the previous year. Out of total exports in 2009-10, exports of earth colours were 7,556 tonnes, red oxide 1,081 tonnes, persian red 20 tonnes and yellow ochre 4 tonnes. Exports were mainly to Philippines (32%), Saudi Arabia and Rep. of Korea (8% each). Exports of earth clay increased in 2009-10 to 3,305 tonnes from 2,170 tonnes in the previous year. Exports were mainly to Malaysia, Saudi Arabia, and Bangladesh (Tables - 9 to 14).

Imports

Imports of ochre increased to 2,378 tonnes in 2009-10 from 1,643 tonnes in the previous year. Out of total imports in 2009-10, imports of earth colours were 1,155 tonnes, red oxide 1,145 tonnes and yellow ochre 78 tonnes. Imports were mainly from Iran (44 %), USA (14 %), Thailand (13%) and Indonesia (11%). Imports of earth clay were 29 tonnes in 2009-10 as against 138 tonnes in the previous year. The imports were mainly from China and Spain (Tables - 15 to 20).

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	12828	133324	8661	102014
Philippines	2403	13911	2784	17862
Korea, Rep. of	766	12332	488	7377
Kenya	417	3197	407	6554
Thailand	608	7440	434	5430
UAE	1069	5801	393	5272
Saudi Arabia	967	8235	514	5231
Singapore	279	4187	346	4933
Taiwan	468	6340	261	3573
Germany	382	6807	145	2013
China	756	10024	150	1787
Other countries	4713	55050	2739	41982

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	12109	111212	7556	75808
Philippines	2381	13408	2749	16822
Korea, Rep.of	766	12332	488	7377
Thailand	608	7440	429	5112
UAE	1069	5783	385	4883
Saudi Arabia	957	8026	463	4636
Singapore	273	3694	315	4421
Taiwan	468	6340	261	3573
Germany	382	6807	145	2013
China	753	9869	150	1787
Japan	407	6197	84	1313
Other countries	4045	31316	2087	23871

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	8	623	4	290
Nepal	++	14	3	184
Saudi Arabia	-	-	1	87
South Africa	-	-	++	19
Bangladesh	++	41	-	-
Brazil	3	141	-	-
Kenya	3	124	-	-
Sri Lanka	++	52	-	-
Tanzania	2	247	-	-
Uganda	++	4	-	-

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	54	7855	20	1295
Ghana	-	-	20	1288
Nepal	-	-	++	7
Italy	54	7855	-	-

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	657	13634	1081	24621
Kenya	13	374	159	4535
Nepal	37	1146	96	4070
Malaysia	–	–	110	1790
Indonesia	208	2429	134	1535
Tanzania	30	306	58	1405
Zambia	9	587	5	1092
Philippines	22	503	35	1040
Guinea	41	789	71	1015
USA	11	2127	2	394
Turkey	100	985	22	365
Other countries	186	4388	389	7380

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	2170	13636	3305	18392
Saudi Arabia	1530	9542	910	5915
Malaysia	–	–	960	5715
Bangladesh	100	256	500	1495
Nepal	131	498	266	1106
Mozambique	–	–	80	1045
UAE	180	865	188	944
Sri Lanka	49	441	86	708
Kenya	25	200	55	239
Canada	26	308	36	117
Oman	41	688	–	–
Other countries	88	838	224	1108

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	1643	110488	2378	123482
Thailand	220	21430	321	37382
Indonesia	385	41490	271	29472
USA	24	3739	340	18887
China	182	17462	206	15412
Italy	25	5750	16	6169
Hong Kong	3	1038	15	4705
Iran	127	516	1047	4278
Austria	–	–	68	1685
Germany	49	7609	2	568
Brazil	570	8639	–	–
Other countries	58	2815	92	4924

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	202	1895	1155	6865
Iran	127	516	1047	4278
Austria	–	–	68	1685
Taiwan	–	–	40	656
USA	1	240	++	245
China	20	515	–	–
Czech Republic	4	310	–	–
Germany	++	36	–	–
Pakistan	50	262	–	–
UK	++	16	–	–
Other countries	–	–	++	1

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	58	9241	78	5364
China	36	3786	67	2602
Italy	22	4916	8	1902
UK	++	53	++	122
Japan	–	–	++	70
Germany	–	–	++	6
Netherlands	++	407	–	–
USA	++	78	–	–
Unspecified	–	–	3	662
Other countries	++	1	–	–

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	28	5268	++	179
USA	–	–	++	175
Germany	8	4564	++	4
Thailand	20	704	–	–

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	1355	94084	1145	111074
Thialand	200	20726	321	37382
Indonesia	385	41490	271	29472
USA	23	3421	340	18467
China	126	13161	139	12810
Hong Kong	3	1038	15	4705
Italy	3	834	8	4267
Belgium	–	–	22	1671
Switzerland	2	765	1	722
Germany	41	3009	2	558
Brazil	570	8639	–	–
Other countries	2	1001	26	1020

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	138	8587	29	744
Spain	9	291	10	352
China	19	378	19	327
France	–	–	++	63
UK	–	–	++	2
Sri Lanka	39	478	–	–
USA	71	7440	–	–