

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 2007-08, DMG, Rajasthan, conducted Regional mineral survey for red ochre and masonry stone in Bidaraka, Banawar, Haldina and Nangal Charan, in Alwar district, covering 150 sq km area. Red ochre deposit was marked in 50 x 20 m area near village Bidaraka and about 22,200 tonnes of red ochre resources were estimated.

PRODUCTION, STOCKS & PRICES

The production of ochre at 918 thousand tonnes in 2007-08 decreased by about 12% as compared to that in the previous year due to temporary closure of mines for want of environmental clearance and lack of demand.

There were 28 reporting mines in 2007-08 as against 32 in the previous year. Besides, the production of ochre was also reported as an associated mineral from 12 mines. Six principal producers accounted for 86% of the total production during the year. The entire production of ochre was reported from private sector in both the years.

Rajasthan continued to be the leading producing State of ochre, contributing 93% of the total production in 2007-08 followed by Madhya Pradesh with 4%. Karnataka, Andhra Pradesh and Gujarat share one percent each (Tables - 2 to 5).

Mine-head stocks of ochre at the end of the year 2007-08 were 123 thousand tonnes as against 70 thousand tonnes at the beginning of the year (Table - 6).

The average daily employment of labour in 2007-08 was 369 as against 386 in the previous year. Domestic prices of ochre are furnished in Table - 7.

**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, 2007-08

Name & address of producer	Location of mine	
	State	District
*Mohd. Sherkhan Pathan P. O. Sawa, Dist. Chhittorgarh, Rajasthan.	Rajasthan	Chittorgarh
*Smt. Tamanna Begum At & P. O. Sawa, Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh
M.J. Minerals Prop. Mohd. Jawed Khan At & P. O. Sawa, Dist. Chhittorgarh, Rajasthan.	Rajasthan	Chittorgarh
Piyush Sharda Near Novelty Cinema Nimbahera, Dist. Chittorgarh.	Rajasthan	Chittorgarh
Suresh Prakash Sharda Near Novelty Cinema Nimbahera, Dist. Chittorgarh Rajasthan.	Rajasthan	Chittorgarh
Sushama Sharma Jalodia, At & P. O. Sawa, Dist. Chittorgarh, Rajasthan.	Rajasthan	Chittorgarh

* Producing ochre as an associated mineral.

**Table – 3 : Production of Ochre, 2005-06 to 2007-08
(By States)**

State	(Qty. in tonnes; value in Rs. '000)					
	2005-06		2006-07		2007-08 (p)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	1007088	62894	1047831	93568	917552	83609
Andhra Pradesh	10650	476	8292	377	15448	788
Gujarat	530	5	772	77	420	42
Jharkhand	-	-	481	45	187	34
Karnataka	11550	1887	13282	2700	9377	1360
Madhya Pradesh	18453	2603	25098	4004	34962	6449
Rajasthan	965905	57923	999906	86324	857158	74937

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**Table – 4: Production of Ochre, 2006-07 and 2007-08
(By Sector/States/Districts)**

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

State/District	2006-07			2007-08(p)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India	32(11)	1047831	93568	28(12)	917552	83609
Private sector	32(11)	1047831	93568	28(12)	917552	83609
Andhra Pradesh	2	8292	377	4	15448	788
Kurnool	2	8292	377	4	15448	788
Gujarat	3	772	77	1	420	42
Patan	3	772	77	1	420	42
Jharkhand	1	481	45	1	187	34
Singhbhum (West)	1	481	45	1	187	34
Karnataka	1(3)	13282	2700	0(1)	9377	1360
Bellary	1(3)	13282	2700	0(1)	9377	1360
Madhya Pradesh	15(3)	25098	4004	13(6)	34962	6449
Jabalpur	2	896	179	1(1)	7485	717
Rewa	1(2)	11796	1883	1(4)	4991	620
Satna	10(1)	9655	1771	9(1)	20331	4700
Umaria	2	2751	170	2	2155	411
Rajasthan	10(5)	999906	86324	9(5)	857158	74937
Bhilwara	- (1)	-	-	(1)	4265	427
Bikaner	(2)	4574	343	(1)	14665	2009
Chittorgarh	8(2)	990547	85528	8(3)	797428	68829
Udaipur	2	4785	453	1	40800	3672

**Table - 5 : Production of Ochre, 2006-07 and 2007-08
(By Frequency Groups)**

(Qty. in tonnes)

Production group	No. of mines		Production for the group		Percentage in total production		Cumulative percentage	
	2006-07	2007-08	2006-07	2007-08	2006-07	2007-08	2006-07	2007-08
All Groups	32(11)	28(12)	1047681	917552	100.00	100.00	-	-
Up to 500	15(2)	7(2)	2328	1487	0.22	0.16	22	0.16
501 to 1000	2(1)	1(2)	2336	2202	0.22	0.24	0.44	0.40
1001 to 2000	5	5(1)	6896	9830	0.66	1.07	1.10	1.47
2001 to 3000	1	0	2400	-	22	-	1.32	1.47
3001 to 5000	3(2)	3(1)	20639	16315	1.97	1.78	3.29	3.25
5001 & above	6(6)	12(6)	1013232	887718	96.71	96.75	100	100

Figures in parentheses indicate number of associated mines.

Note : Two primary mines of ochre producing other minerals but having nil production of ochre.

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**Table – 7 : Prices of Ochre, 2005-06 to 2007-08
(Domestic Markets)**

(In Rs. per tonne)

Grade	Market	2005-06	2006-07	2007-08(p)
Ochre (Red oxide)	Ex-plot/yard Hospet (Karnataka)	1200	1200	1200
Red Ochre	Ex-mine Bambora (Rajasthan)	60	70	70
Red Ochre (up to 50% Fe ₂ O ₃)	Ex-mine Bhilwara (Rajasthan)	125	150	150
Red Ochre (50-70% Fe ₂ O ₃)	Ex-mine Bhilwara (Rajasthan)	250	300	300
Red Ochre	Ex-mine Nimbaheera (Rajasthan)	73-95	79-145	79-145
Red Ochre	Ex-mine Satna (Madhya Pradesh)	200	200	200
Red Ochre	f.o.r. Satalpur (Gujarat)	170	180	180
Red Ochre	Ex-mine Chittorgarh (Rajasthan)	53	53	53

**Table – 6 : Mine-head Stocks of Ochre, 2007-08(p)
(By States)**

(In tonnes)

State	At the beginning of the year	At the end of the year
India	69840	122895
Andhra Pradesh	1685	3276
Chhattisgarh	0	6180
Gujarat	194	202
Jharkhand	544	539
Karnataka	9031	7558
Madhya Pradesh	7243	28823
Rajasthan	51143	76317

CONSUMPTION

Ochre consumption for 2007-08 in the organised sector was estimated at 450,100 tonnes of which cement industry alone consumed about 98%. 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 - 8).

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.

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.

**Table – 8 : Reported Consumption of Ochre, 2005-06 to 2007-08
(By Industries)**

(In tonnes)

Industry	2005-06(R)	2006-07	2007-08 (p)
All Industries	519500	590400	450100
Cement	509200 (8)	580100 (8)	439800 (8)
Ceramic	8900 (1)	8900 (1)	8900 (1)
Foundry	200 (1)	200 (1)	200 (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.

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 increased to 6,035 tonnes in 2007-08 from 4,353 tonnes in the previous year. Out of total exports in 2007-08, exports of earth colours were 4,775 tonnes, red oxide 660 tonnes, persian red 456 tonnes and yellow ochre 144 tonnes. Exports were mainly to Philippines (22%) and UAE (13%). Exports of earth clay increased in 2007-08 to 2,469 tonnes from 1,352 tonnes in the previous year. Exports were mainly to Saudi Arabia, Kenya, Bangladesh, Netherlands, Sri Lanka and UAE (Tables - 9 to 14).

Imports

Imports of ochre increased to 1,768 tonnes in 2007-08 from 1,464 tonnes in the previous year. Out of total imports in 2007-08, imports of earth colours were 6 tonnes, red oxide 1,743 tonnes and yellow ochre 18 tonnes. Imports were mainly from Belgium (42%), China (28%) and Thailand and USA (11%) each. Imports of earth clay were 19 tonnes in 2007-08 as against 318 tonnes in the previous year. In 2007-08, imports were mainly from USA (Tables - 15 to 20).

**Table - 9 : Exports of Ochre : Total
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	4353	55852	6035	107231
Italy	216	11648	481	54340
Philippines	848	4287	1304	7662
Korea, Rep. of	178	2047	483	5353
UAE	450	5239	793	5238
Nepal	42	799	158	4322
Saudi Arabia	60	632	308	3688
Thailand	35	531	303	2413
Tanzania	506	4451	281	1441
Yemen Republic	276	4914	72	1239
Oman	285	3776	40	950
Other countries	1457	17528	1812	20585

**Table - 10 : Exports of Ochre : Earth Colours
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	3266	24859	4775	36277
Philippines	828	4117	1201	5803
Korea, Rep. of	178	2047	483	5353
UAE	430	4644	790	5086
Saudi Arabia	24	128	305	3508
Thailand	28	150	303	2413
Spain	140	690	101	1586
Tanzania	505	4417	279	1372
Yemen Republic	184	2821	72	1239
UK	20	593	95	994
Kuwait	96	1030	41	568
Other countries	833	4222	1105	8355

**Table - 11 : Exports of Ochre : Yellow Ochre
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	38	1389	144	9035
Italy	-	-	25	7718
Philippines	-	-	72	346
USA	-	-	22	319
Guam	-	-	8	302
Saudi Arabia	-	-	3	180
Indonesia	14	312	-	-
Senegal	12	508	-	-
Sri Lanka	6	170	-	-
UAE	2	88	-	-
Zambia	2	239	-	-
Other countries	2	72	14	170

**Table - 12 : Exports of Persian Red
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	259	14051	456	46743
Italy	216	11648	456	46622
Bangladesh	5	414	++	121
Nigeria	17	1575	-	-
Spain	20	380	-	-
Tanzania	1	34	-	-

**Table - 13 : Exports of Red Oxide
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	790	15553	660	15176
Nepal	35	764	105	3744
Indonesia	-	-	186	1703
Philippines	20	170	31	1513
Oman	285	3776	40	918
Guinea	27	263	20	861
Papua New Guinea	26	413	13	584
Canada	15	1413	15	445
Kuwait	62	761	25	328
Fiji	27	1203	6	195
Yemen Republic	92	2093	-	-
Other countries	201	4697	219	4885

**Table - 14 : Exports of Earth Clay
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	1352	8667	2469	16545
Saudi Arabia	607	3826	1072	5971
Kenya	271	1215	387	2493
Netherlands	-	-	184	2030
UAE	81	511	152	1472
Bangladesh	-	-	220	1159
Sri Lanka	244	1901	118	1056
Nepal	35	184	122	605
Tanzania	31	326	44	464
Oman	39	347	43	446
Canada	-	-	52	376
Other countries	44	357	75	473

**Table - 15 : Imports of Ochre : Total
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	1464	54425	1768	68282
Thailand	13	1275	193	18342
China	350	19505	489	16331
Belgium	420	7848	749	8493
USA	96	5054	192	8124
Indonesia	1	174	64	5814
Italy	11	2044	16	3034
Germany	29	4564	11	1622
UAE	43	1655	38	1608
Kenya	221	2854	-	-
Unspecified	7	2613	2	231
Other countries	273	6839	14	4683

**Table - 16 : Imports of Ochre : Earth Colours
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	20	1349	6	694
Germany	++	17	6	583
UK	20	1321	-	-
USA	++	11	++	111

**Table - 17 : Imports of Ochre : Yellow Ochre
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	34	6684	18	4027
Italy	11	2044	16	3023
Germany	10	3069	2	396
Switzerland	++	221	++	281
UK	-	-	++	166
Netherlands	-	-	++	91
Singapore	-	-	++	70
China	13	1339	-	-
Malaysia	++	5	-	-
USA	++	6	-	-

**Table - 18 : Imports of Persian Red
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	1	406	1	2032
USA	-	-	1	1867
Germany	++	57	++	165
China	1	349	-	-

**Table - 19 : Imports of Red Oxide
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	1409	45986	1743	61529
Thailand	13	1275	193	18342
China	336	17817	489	16331
Belgium	420	7848	749	8493
USA	96	5037	191	6146
Indonesia	1	174	64	5814
Malaysia	++	3	9	2481
UAE	43	1655	38	1608
Kenya	221	2854	-	-
Brazil.	195	2437	-	-
Unspecified	7	2613	2	231
Other countries	77	4273	8	2083

**Table - 20 : Imports of Earth Clay
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	318	3447	19	657
USA	++	36	17	597
UK	-	-	1	50
China	3	30	1	10
Iran	49	329	-	-
South Africa	216	1842	-	-
Spain	50	1210	-	-