

# 17 Bauxite

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**B**auxite is basically an aluminous rock containing hydrated aluminium oxide as the main constituent and iron oxide, silica and titania in varying proportions. Hydrated aluminium oxides present in the bauxite ore are diaspore and boehmite,  $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$  ( $\text{Al}_2\text{O}_3$ -85%; Al-45%); gibbsite or hydrargillite,  $\text{Al}_2\text{O}_3 \cdot 3 \text{H}_2\text{O}$  ( $\text{Al}_2\text{O}_3$ -65.4%; Al-34.6%), and bauxite (containing colloidal alumina hydrogel),  $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$  ( $\text{Al}_2\text{O}_3$ -73.9%; Al-39.1%). The iron oxide in bauxite ore is present as hematite or goethite, silica as clay and free quartz, and titania as leucosene or rutile. Bauxite is an essential ore of aluminium which is one of the most important non-ferrous metals used in the modern industry. It is also an essential ore for refractory and chemical industries. The country has abundant resources of bauxite which can meet both domestic and export demands.

## RESOURCES

Resources of bauxite in the country as on 1.4.2005, as per UNFC system, are placed at 3,290 million tonnes. These resources include 899 million tonnes reserves and 2,390 million tonnes remaining resources. By grades, about 86% resources are of metallurgical grade. The resources of refractory and chemical grades are limited and together account for about 3 percent. By States, Orissa alone accounts for 55% of country's resources of bauxite followed by Andhra Pradesh (19%), Gujarat (6%), Chhattisgarh (5%), Madhya Pradesh (4%), Jharkhand (4%) and Maharashtra (3%). Major bauxite resources are concentrated in the East Coast bauxite deposits in Orissa and Andhra Pradesh (Table - 1).

## EXPLORATION & DEVELOPMENT

Details of exploration carried out for bauxite by GSI, MECL, State Directorates of Geology & Mining, Governments of Chhattisgarh, Maharashtra, Orissa, GMDC and NALCO, during 2006-07 and 2007-08, are given in Table - 2 (A) and Table - 2 (B), respectively.

## PRODUCTION, STOCKS & PRICES

The production of Bauxite at 23.1 million tonnes in 2007-08 increased by 47% as compared to 15.7 million tonnes in the previous year owing to burgeoning demand.

There were 209 reporting mines in 2007-08 as against 197 in the previous year. In all, 88 producers reported production of bauxite in 2007-08. Ten principal producers having 45 mines contributed about 78 % of the total production. Fifty- seven major mines, each producing more than 50 thousand tonnes per annum, together accounted for 93% of all-India production.

The contribution of the Panchpatmali bauxite mine of NALCO was 20 % of the total production. The share of 16 public sector mines was about 25 % of the total production in 2007-08 as against 12 mines contributing 31% in the previous year.

About 17 % of the total production of bauxite was of grade 40-45%  $\text{Al}_2\text{O}_3$ , 26 % of below 40%  $\text{Al}_2\text{O}_3$  grade, 34% of other grades, 13 % of 45-50%  $\text{Al}_2\text{O}_3$  grade, 6 % of cement grade, 3% in 50-55%  $\text{Al}_2\text{O}_3$  grade and one percent in 55% to below 60%  $\text{Al}_2\text{O}_3$  grade. Nominal production of less than one percent was reported in Refractory and Abrasive grades during the year under review.

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

(In '000 tonnes)

Grade/State	Reserves				Remaining resources					Total resources (A+B)			
	Proved STD111	Probable		Feasibility STD211	Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)				
		STD121	STD122								STD221	STD222	
<b>All India : Total</b>	<b>538945</b>	<b>225424</b>	<b>135015</b>	<b>899384</b>	<b>335</b>	<b>90224</b>	<b>240179</b>	<b>579561</b>	<b>394022</b>	<b>1085576</b>	<b>536</b>	<b>2390432</b>	<b>3289817</b>
<b>By Grades</b>													
Chemical	680	49	199	928	-	4978	234	2383	182	5063	-	12840	13767
Refractory	3370	44937	1146	49453	-	7753	411	2670	208	9368	-	20410	69864
Chemical/refractory, mixed with others	2579	626	1974	5179	-	1854	65	1854	216	8984	-	12973	18152
Metallurgical-1	426501	171854	80313	678668	335	43255	171499	405659	289181	614649	536	1525115	2203783
Metallurgical-2	51247	5092	16812	73150	-	7907	38103	104351	58659	269952	-	478972	552122
Metallurgical, mixed	11363	283	6818	18463	-	2978	2723	38458	500	25843	-	70502	88965
Low	23538	617	16863	41017	-	6729	21418	19856	32487	106081	-	186571	227588
Mixed grade excluding chemical/refractory	15327	1461	9383	26172	-	13969	4676	2320	2651	10290	-	33906	60078
Abrasive	194	505	344	1043	-	802	20	56	-	428	-	1306	2348
Others	191	-	187	378	-	-	85	1949	4848	5042	-	11923	12302
Unclassified	3515	-	712	4228	-	-	720	-	5090	7979	-	13789	18017
Not known	441	-	265	706	-	-	225	5	-	21896	-	22126	22832
<b>By States</b>													
Andhra Pradesh	199	5	48	251	-	-	2260	188720	135860	288176	-	615016	615267
Bihar	-	-	-	-	-	-	-	-	-	4114	-	4114	4114
Chhattisgarh	30706	46981	11279	88966	-	36759	3823	1262	2572	14933	-	59349	148315
Goa	27037	1097	6492	34626	-	1320	263	5500	-	8646	-	15729	50355
Gujarat	43952	2400	21861	68214	-	40440	27806	12195	328	39354	-	120124	188337
Jammu & Kashmir	-	-	-	-	-	-	-	1323	182	520	-	2025	2025
Jharkhand	13408	5528	12722	31657	-	566	5242	320	17397	61827	536	85888	117545
Karnataka	4576	367	786	5729	-	394	7180	378	2940	32882	-	43774	49503
Kerala	55	-	-	55	-	-	-	2037	9284	2722	-	14043	14098
Madhya Pradesh	13530	1768	1540	16838	-	8316	237	8920	53715	46037	-	117225	134064
Maharashtra	21091	5568	12499	39157	335	515	2598	38831	8354	21852	-	72485	111643
Orissa	380363	161711	65924	607997	-	-	188630	309684	152807	549153	-	1200274	1808271
Rajasthan	-	-	-	-	-	-	-	-	-	528	-	528	528
Tamil Nadu	4029	-	1865	5894	-	1913	2140	-	10084	6814	-	20951	26845
Uttar Pradesh	-	-	-	-	-	-	-	10390	500	8018	-	18908	18908

Figures rounded off.

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**Table - 2 (A) : Details of Exploration Activities for Bauxite, 2006-07**

Agency/ State/ District	Location/ Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks / Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metres		
<b>GSI, Orissa</b>							
Bonai- Kendujhar	Kadalia Block	-	-	-	-	-	Estimated resources of 1.97 million tonnes with an average grade of Al <sub>2</sub> O <sub>3</sub> 48.34%, Fe <sub>2</sub> O <sub>3</sub> 19.44% , SiO <sub>2</sub> 4.04% TiO <sub>2</sub> 2.5%, LOI 24.54% for a strike length of 6 km
<b>MECL, Jharkhand</b>							
Gumla	Lupungpat Block Toposheet No. 73 A/8	-	-	2	35	-	Exploratory drilling of two boreholes indicated bauxite thickness of 2-4 m with 50-52% Al <sub>2</sub> O <sub>3</sub> , and 2-3% SiO <sub>2</sub>
<b>State Directorate of Geology &amp; Mining, Chhattisgarh</b>							
Surguja	Pathrai Sarbhanya area in Mainpat Plateau	1:50000	2.04	246	2670	1166	Extension of bauxite deposit towards west of Pathrai was found. Estimated 6 lakh tonnes of metal grade bauxite resources in Pathrai block with Al <sub>2</sub> O <sub>3</sub> content ranging from 42% to 55%, the average being 47.50%.
Kabirdham	Bandhtola Area	1:50000 1:4000	122 1.36	-	-	488	Estimated 55 lakh tonnes of bauxite resources under inferred category in Duldula and Akaljhari area.
	Kawardha & Pandaria Tehsils	1:50,000	1770	-	-	279	Over 25 pockets of bauxite of various dimensions were identified with Al <sub>2</sub> O <sub>3</sub> content varying between 35% to 60%. Estimated 110 Lakh tonnes metal grade bauxite resources under inferred category.
<b>Directorate of Geology, Orissa</b>							
Koraput	Tadapani near Ramgarh	1:2000	1.47	-	-	186	Identified four laterite bearing plateau with elevation more than 1000 m above MSL. The main plateau has bauxite bearing area of 1.47 sq km with thickness varying from 2 m to 6 m.
<b>Mysore Minerals Ltd,</b>							
Bagalkote	Paduvare Byndoor	-	-	-	-	-	About 1.49 million tonnes of bauxite reserves estimated.
<b>NALCO</b>							
Koraput	Pachpatmali Bauxite Mine	-	-	409	8241.5	10191	About 15 million tonnes of bauxite reserves estimated.
<b>BALCO</b>							
Kabirdham	Bodai Daldali Bauxite Mine	-	-	283	2121.3	-	At the end of 2006-07, total reserves of bauxite estimated at 6.3 million tonnes.
-do-	Mainpat Bauxite Mine	-	-	-	-	-	At the end of 2006-07 total reserves of bauxite estimated at 8.97 million tonnes.

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**Table - 2 (B) : Details of Exploration Activities for Bauxite, 2007-08**

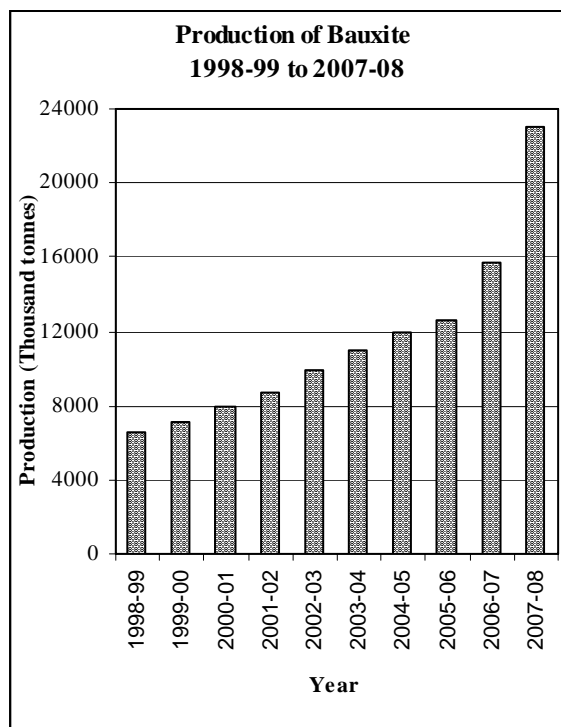
Agency/ State/ District	Location/ Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks / Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Metres		
<b>Directorate of Geology, Orissa</b>							
Kandhamal	Ushabali Plateau	1:12500 1:2000	27 1.81	-	-	312	Bauxite in the plateau is pink to cherry red and gibbsitic type. The thickness of bauxite varies from 1m to 8.4 m.
<b>State Directorate of Geology &amp; Mining, Chhattisgarh</b>							
Surguja	Patharai (west) area of Mainpat Plateau	1:50,000	2.08	199	2078.35	758	Estimated 5 lakh tonnes of metal grade bauxite resources with 41 to 54.5% Al <sub>2</sub> O <sub>3</sub> content.
Kabirdham	Bandhatola Area	1:4000	0.34	-	-	44	Few occurrences of bauxite were noted in Duldula and Akaljhari area.
- do -	Pondi area	1:50,000	151.55	-	-	74	Pocket deposits of bauxite having 33 to 58.8% Al <sub>2</sub> O <sub>3</sub> content identified.
<b>State Directorate of Geology &amp; Mining, Maharashtra</b>							
Kolhapur	Ghungar Area Teh. - Sahuwadi	1:25000	46	1	-	-	Estimated 2.8 million tonnes bauxite resources and 4 million tonnes laterite resources.
<b>Commissioner of Geology &amp; Mining, Gujarat</b>							
Jamnagar	Around village Bhatia, Kalyanpur Taluk	-	-	19	411.95	-	-
<b>NALCO</b>							
Koraput	North Block Part II and Central Block Sector I of Panchpatmali bauxite deposit	-	-	-	-	8547.48	-

## BAUXITE

Gujarat emerged as the leading producing state accounting for about 54% of the total production. Next in the order of production were Orissa (20%), Chhattisgarh and Maharashtra (8 % each), Jharkhand (5%), Madhya Pradesh and Tamil Nadu (2% each) and the remaining one percent was produced by Goa and Karnataka (Tables - 3 to 6).

Mine-head stocks at the end of 2007- 08 were 5.4 million tonnes as compared to 2.3 million tonnes at the beginning of the year. About 94% of total stock was held in Gujarat at the end of the year. Out of the total closing stock 75 % was of grade others (Table - 7).

The average daily employment of labour in Bauxite mines was 8,499 in 2007-08 as against 8082 in the previous year. Domestic prices of bauxite are furnished in Table - 8.



**Table - 3 : Principal Producers of Bauxite  
2007-2008**

Name & address of producer	State	District
National Aluminium Co. Ltd, NALCO Bhawan, P/1, Nayapali, Bhubaneswar -751 013, Orissa.	Orissa	Koraput
Hindalco Industries Ltd, Century Bhawan, Dr. Annie Besant Road,Worli, Mumbai -400 025 Maharashtra.	Chhattisgarh Jharkhand Maharashtra	Surguja Gumla Lohardaga Kolhapur
Prabhu Das Vithal Das C/O Ashapura Minechem Ltd, Opp. Ashok Petrol Pump, Jamnagar Dwarka Highway, Jam-Khambhalia-361 305, Dist. Jamnagar, Gujarat.	Gujarat	Jamnagar
Bombay Minerals Ltd, Dwarka-Jamnagar Highway, Opposite Ashok Petrol Pump, Jam-khambhalia - 361 305, Dist. Jamnagar, Gujarat.	Gujarat	Jamnagar

(Contd.)

Table - 3 (Concl.)

Name & address of producer	State	District
Bharat Aluminium Co. Ltd. BALCO Nagar, Korba - 495 684, Chhattisgarh.	Chhattisgarh	Kabirdham
Mineral & Minerals Corporation, Vazir fail. Jamnagar. 361 001, Gujarat.	Gujarat	Jamnagar
Gujarat Mineral Dev.Corp. Ltd. Khanij Bhavan, 132. ft Ring Road. Vastrapur, Ahmedabad.	Gujarat	Kachchh
M/S Carborundum Universal Ltd, Jamnagar, Tiam House, 28 Rajaji Road, Chennai.	Gujarat	Gujarat
Smt.Pushpaben P. Makhecha, Mayur Pankh Society, opp. Circuit Villa, Chopati Road, Porbandar - 360 575.	Gujarat	Jamnagar
Kantilal M. Mehata C/o Ashapura Minechem Ltd, Jam - Khambhalia -361 305.	Gujarat	Jamnagar

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**Table - 4 : Production of Bauxite, 2005-06 to 2007-08**  
(By States)

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

States	2005-06		2006-07		2007-08(p)	
	Quantity	Value	Quantity	Value	Quantity	Value
<b>India</b>	<b>12595803</b>	<b>2933230</b>	<b>15732535</b>	<b>3847802</b>	<b>23084677</b>	<b>5259380</b>
Chhattisgarh	1332165	386081	1592745	548687	1747098	525632
Gujarat	3114314	514844	5914792	1019514	12515094	2278084
Goa	25923	1800	111097	8332	129259	9694
Jharkhand	1508370	357295	1428154	430047	1243132	379690
Karnataka	72840	9879	110971	18276	161554	28425
Kerala	9915	1590	-	-	-	-
Madhya Pradesh	102078	24114	196024	50516	474550	119966
Maharashtra	1255440	470542	1364539	441758	1785330	531830
Orissa	4871163	1133220	4673886	1292562	4685973	1349396
Tamil Nadu	303595	33865	340327	38110	342687	36663

**Table - 5 (A) : Gradewise Production of Bauxite, 2006-07**  
(By Sectors, States and Districts)

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

State/District	No. of mines	Production by Grades: Al <sub>2</sub> O <sub>3</sub> content										For use other than Alumina & Aluminium extraction				Total	
		For use in Alumina & Aluminium extraction					Below 40%	Cement	Abrasive	Refractory	Others	Quantity	Value	Total			
		60% & above	55%-60%	50%-55%	45%-50%	40%-45%								Quantity	Value		
<b>India</b>	<b>197(7)</b>	<b>1040</b>	<b>41378</b>	<b>73151</b>	<b>2620534</b>	<b>4730063</b>	<b>5378716</b>	<b>312740</b>	<b>57068</b>	<b>138807</b>	<b>2379038</b>	<b>15732535</b>	<b>3847802</b>				
Public sector	12		1007	56052	83943	47432	4646764	-	-	-	-	4835198	1313748				
Private sector	185	1040	40371	17099	2536591	4682631	731952	312740	57068	138807	2379038	10897337	2534054				
<b>Chhattisgarh</b>	<b>6</b>	-	-	-	<b>999265</b>	<b>593480</b>	-	-	-	-	-	<b>1592745</b>	<b>548687</b>				
Kawardha	1	-	-	-	331945	-	-	-	-	-	-	331945	65393				
Surguja	5	-	-	-	667320	593480	-	-	-	-	-	1260800	483294				
<b>Goa</b>	<b>2</b>	-	-	-	-	-	-	<b>111097</b>	-	-	-	<b>111097</b>	<b>8332</b>				
South Goa	2	-	-	-	-	-	-	111097	-	-	-	111097	8332				
<b>Gujarat</b>	<b>104</b>	<b>1040</b>	<b>41378</b>	<b>58590</b>	<b>291869</b>	<b>2569279</b>	<b>176080</b>	<b>201643</b>	<b>57068</b>	<b>138807</b>	<b>2379038</b>	<b>5914792</b>	<b>1019514</b>				
Amreli	1	-	-	-	-	-	89684	-	-	-	-	89684	11793				
Jamnagar	89	1040	40371	14727	285546	2561829	-	157106	56759	138807	2350134	5606319	958806				
Junagarh	1	-	-	-	-	-	-	44000	-	-	-	44000	4400				
Kachchh	7	-	1007	43863	0	0	-	-	309	-	16104	61283	18131				
Kheda	1	-	-	-	-	7050	-	-	-	-	-	7050	874				
Porbandar	4	-	-	-	5883	-	86301	537	-	-	12800	105521	25258				
Sabarkantha	1	-	-	-	440	400	95	-	-	-	-	935	252				
<b>Jharkhand</b>	<b>30</b>	-	-	-	<b>891487</b>	<b>536667</b>	-	-	-	-	-	<b>1428154</b>	<b>430047</b>				
Gumla	18	-	-	-	686499	86054	-	-	-	-	-	772553	279617				
Lohardaga	12	-	-	-	204988	450613	-	-	-	-	-	655601	150430				

(Contd.)

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Table - 5 (A) (Concl.d.)

State/District	No. of mines	Production by Grades:Al <sub>2</sub> O <sub>3</sub> content										For use other than Alumina & Aluminium extraction				Total	
		For use in Alumina & Aluminium extraction					Below 40%					Cement	Abrasive Refractory	Others	Quantity	Value	
		60% & above	55%-60%	50%-55%	45%-50%	40%-45%	40%	35%	30%	25%	20%						
<b>Karnataka</b>	<b>3</b>	-	<b>14561</b>	<b>17633</b>	<b>47432</b>	<b>31345</b>	-	-	-	-	-	-	-	-	-	<b>110971</b>	<b>18276</b>
Belgaum	2	-	-	-	-	7859	-	-	-	-	-	-	-	-	-	7859	747
South Kannad	1	-	14561	17633	47432	23486	-	-	-	-	-	-	-	-	-	103112	17529
<b>Madhya Pradesh</b>	<b>39(5)</b>	-	-	<b>67720</b>	<b>64646</b>	<b>63658</b>	-	-	-	-	-	-	-	-	-	<b>196024</b>	<b>50516</b>
Jabalpur	1	-	-	-	-	910	-	-	-	-	-	-	-	-	-	910	229
Katni	4	-	-	1328	38478	27241	-	-	-	-	-	-	-	-	-	67047	18572
Rewa	8	-	-	34832	9533	-	-	-	-	-	-	-	-	-	-	44365	11396
Satna	23(5)	-	-	31560	26168	25974	-	-	-	-	-	-	-	-	-	83702	20319
Sidhi	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Maharashtra</b>	<b>7</b>	-	-	<b>327982</b>	<b>825183</b>	<b>211374</b>	-	-	-	-	-	-	-	-	-	<b>1364539</b>	<b>441758</b>
Kolhapur	5	-	-	45717	825183	211374	-	-	-	-	-	-	-	-	-	1082274	238527
Ratnagiri	2	-	-	282265	-	-	-	-	-	-	-	-	-	-	-	282265	203231
<b>Orissa</b>	<b>3(2)</b>	-	-	<b>24578</b>	<b>22522</b>	<b>4626786</b>	-	-	-	-	-	-	-	-	-	<b>4673886</b>	<b>1292562</b>
Koraput	1	-	-	-	-	4623278	-	-	-	-	-	-	-	-	-	4623278	1264313
Sundergarh	2(2)	-	-	24578	22522	3508	-	-	-	-	-	-	-	-	-	50608	28049
<b>Tamil Nadu</b>	<b>3</b>	-	-	-	<b>70854</b>	<b>269473</b>	-	-	-	-	-	-	-	-	-	<b>340327</b>	<b>38110</b>
Namakkal	2	-	-	-	40229	154117	-	-	-	-	-	-	-	-	-	194346	20738
Salem	1	-	-	-	30625	115356	-	-	-	-	-	-	-	-	-	145981	17372

Figures in parentheses indicate number of associated mines.

**Table - 5 (B) : Gradewise Production of Bauxite, 2007-08(p)**  
(By Sectors, States and Districts)

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

State/District	No. of mines	Production by Grades:Al <sub>2</sub> O <sub>3</sub> content										For use other than Alumina & Aluminium extraction				Total	
		For use in Alumina & Aluminium extraction					Below 40%					Cement	Abrasive	Refractory	Others	Quantity	Value
		60% & above	55%-60%	50%-55%	45%-50%	40%-45%	40%	40%									
<b>India</b>	<b>209(5)0</b>	-	<b>322068</b>	<b>722684</b>	<b>2886345</b>	<b>3917855</b>	<b>5943539</b>	<b>1295554</b>	<b>79610</b>	<b>106750</b>	<b>7810272</b>	<b>23084677</b>	<b>5259380</b>				
Public sector	16	-	105148	509403	222478	72995	4950181	-	-	-	-	5860205	1675792				
Private sector	193	-	216920	213281	2663867	3844860	993358	1295554	79610	106750	7810272	17224472	3583588				
<b>Chhattisgarh</b>	<b>8</b>	-	-	-	<b>1568193</b>	<b>161523</b>	<b>17382</b>	-	-	-	-	<b>1747098</b>	<b>525632</b>				
Kawardha	2	-	-	-	480845	4777	-	-	-	-	-	485622	95854				
Surguja	6	-	-	-	1087348	156746	17382	-	-	-	-	1261476	429778				
<b>Goa</b>	<b>2</b>	-	-	-	-	-	-	<b>129259</b>	-	-	-	<b>129259</b>	<b>9694</b>				
South Goa	2	-	-	-	-	-	-	129259	-	-	-	129259	9694				
<b>Gujarat</b>	<b>109</b>	-	<b>322068</b>	<b>711718</b>	<b>651</b>	<b>2385725</b>	<b>85</b>	<b>1154922</b>	<b>79610</b>	<b>106750</b>	<b>7753565</b>	<b>12515094</b>	<b>2278084</b>				
Amreli	1	-	-	-	-	111407	-	-	-	-	-	111407	35650				
Jamnagar	89	-	229553	-	-	2263073	-	1031728	70709	106750	7700529	11402342	1955044				
Junagarh	1	-	-	-	-	-	-	50364	-	-	-	50364	5036				
Kachchh	11	-	92515	711718	500	-	-	-	8901	-	9636	823270	254297				
Kheda	1	-	-	-	-	10100	-	-	-	-	-	10100	1111				
Porbandar	5	-	-	-	-	-	-	72830	-	-	43400	116230	26641				
Sabarkantha	1	-	-	-	151	1145	85	-	-	-	-	1381	305				
<b>Jharkhand</b>	<b>31</b>	-	-	<b>1051</b>	<b>484128</b>	<b>750264</b>	-	<b>7689</b>	-	-	-	<b>1243132</b>	<b>379690</b>				
Gumla	18	-	-	-	351727	341610	-	-	-	-	-	693337	232517				
Lohardaga	13	-	-	1051	132401	408654	-	7689	-	-	-	549795	147173				

(Contd.)

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Table - 5 (B) (Concl.)

State/District	No. of mines	Production by Grades:Al <sub>2</sub> O <sub>3</sub> content										For use other than Alumina & Aluminium extraction				Total	
		For use in Alumina & Aluminium extraction					For use other than Alumina & Aluminium extraction					Cement	Abrasive	Refractory	Others	Quantity	Value
		60% & above	55%-60%	50%-55%	45%-50%	40%-45%	Below 40%										
<b>Karnataka</b>	<b>2</b>	-	-	<b>25</b>	<b>61537</b>	<b>72995</b>	<b>26997</b>	-	-	-	-	-	-	-	-	<b>161554</b>	<b>28425</b>
Belgaum	1	-	-	-	-	-	4100	-	-	-	-	-	-	-	-	4100	427
South Kannad	1	-	-	25	61537	72995	22897	-	-	-	-	-	-	-	-	157454	27998
<b>Madhya Pradesh</b>	<b>40(5)</b>	-	-	-	<b>66891</b>	<b>62018</b>	<b>341957</b>	<b>3684</b>	-	-	-	-	-	-	-	<b>474550</b>	<b>119966</b>
Jabalpur	1	-	-	-	-	-	320	-	-	-	-	-	-	-	-	320	76
Katni	4(1)	-	-	-	-	53786	14865	-	-	-	-	-	-	-	-	68651	22826
Rewa	7	-	-	-	36002	-	10447	2524	-	-	-	-	-	-	-	48973	11450
Satna	24(4)	-	-	-	30889	8232	62051	1160	-	-	-	-	-	-	-	102332	23309
Shahdol	1	-	-	-	-	-	242600	-	-	-	-	-	-	-	-	242600	61126
Sidhi	3	-	-	-	-	-	11674	-	-	-	-	-	-	-	-	11674	1179
<b>Maharashtra</b>	<b>11</b>	-	-	<b>9890</b>	<b>704945</b>	<b>449912</b>	<b>563876</b>	-	-	-	-	-	-	-	-	<b>1785330</b>	<b>531830</b>
Kolhapur	6	-	-	9890	396974	449912	563876	-	-	-	-	-	-	-	-	1420652	302801
Raigarh	4	-	-	-	3000	-	-	-	-	-	-	-	-	-	-	56707	9450
Ratnagiri	1	-	-	-	304971	-	-	-	-	-	-	-	-	-	-	304971	219579
<b>Orissa</b>	<b>3</b>	-	-	-	-	<b>946</b>	<b>4685027</b>	-	-	-	-	-	-	-	-	<b>4685973</b>	<b>1349396</b>
Koraput	1	-	-	-	-	-	4684684	-	-	-	-	-	-	-	-	4684684	1348420
Sundergarh	2	-	-	-	-	946	343	-	-	-	-	-	-	-	-	1289	976
<b>Tamil Nadu</b>	<b>3</b>	-	-	-	-	<b>34472</b>	<b>308215</b>	-	-	-	-	-	-	-	-	<b>342687</b>	<b>36663</b>
Namakkal	2	-	-	-	-	7190	205449	-	-	-	-	-	-	-	-	212639	21324
Salem	1	-	-	-	-	27282	102766	-	-	-	-	-	-	-	-	130048	15339

Figures in parentheses indicate number of associated mines.

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**Table - 6 : Production of Bauxite, 2006-07 and 2007-08  
(By Frequency Groups)**

(Quantity in tonnes)

Production group	No. of mines		Production		Percentage to total production		Cumulative percentage	
	2006-07	2007-08	2006-07	2007-08	2006-07	2007-08	2006-07	2007-08
<b>Total</b>	<b>197(7)</b>	<b>209(5)</b>	<b>15732535</b>	<b>23084671</b>	<b>100</b>	<b>100</b>	<b>-</b>	<b>-</b>
Upto 1000	50(3)	51(2)	10393	14948	0.07	0.06	0.07	0.06
1001 - 3000	16(2)	20(1)	35290	34027	0.22	0.15	0.29	0.21
3001 - 5000	10	9	36670	35670	0.23	0.16	0.52	0.37
5001 - 10000	28(1)	21	204199	157664	1.30	0.68	1.82	1.05
10001 - 25000	33(1)	25(2)	541746	431830	3.44	1.87	5.26	2.92
25001 - 50000	22	26	742167	925897	4.72	4.01	9.98	6.93
50001 and above	38	57	14162070	21484635	90.02	93.07	100.00	100.00

Figures in parentheses indicate the number of associated mines.

**Table -7 (A) : Mine-head Stocks of Bauxite at the Beginning of the Year, 2007-08  
(By States & Grades)**

(In tonnes)

State	Stocks by Grades : AL <sub>2</sub> O <sub>3</sub> Content						For use other than Alumina & Aluminium metal extraction				Total
	For use in Alumina & Aluminium metal extraction						Cement	Abrasive	Refractory	Others	
	60% & above	55% - 60%	50% - 55%	45% - 50%	40% - 45%	Below 40%					
<b>India</b>	-	<b>102044</b>	<b>162581</b>	<b>169855</b>	<b>737938</b>	<b>94508</b>	<b>182790</b>	<b>15172</b>	<b>17908</b>	<b>822519</b>	<b>2305315</b>
Chhattisgarh	-	-	-	7479	3685	3443	99	-	-	-	14706
Goa	-	-	-	-	-	-	34282	-	-	-	34282
Gujarat	-	102044	157955	58742	619266	2670	148292	15172	16835	822519	1943495
Jharkhand	-	-	3792	-	73947	6193	117	-	-	-	84049
Karnataka	-	-	-	-	-	14961	-	-	-	-	14961
Kerala	-	-	-	-	-	71	-	-	-	-	71
Madhya Pradesh	-	-	3190	1180	14765	23321	-	-	1073	-	43529
Maharashtra	-	-	1436	74698	4565	19488	-	-	-	-	100187
Orissa	-	-	-	23964	13925	8568	-	-	-	-	46457
Tamil Nadu	-	-	-	-	7785	15793	-	-	-	-	23578

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**Table -7 (B) : Mine-head Stocks of Bauxite at the end of the Year, 2007-08 (p)**  
(By States & Grades)

(In tonnes)

State	Stocks by Grades : AL <sub>2</sub> O <sub>3</sub> Content for use in Alumina & Aluminium metal extraction					For use other than Alumina & Aluminium metal extraction				Total
	55% - 60%	50% - 55%	45% - 50%	40% - 45%	Below 40%	Cement	Abrasive	Refractory	Others	
	<b>India</b>	<b>90499</b>	<b>358403</b>	<b>77180</b>	<b>131940</b>	<b>86437</b>	<b>587109</b>	<b>2482</b>	<b>11150</b>	
Chhattisgarh	-	-	1758	1173	-	-	-	-	-	2931
Gujarat	90499	357423	-	54498	53	585508	2482	11150	3941661	5043274
Jharkhand	-	-	8054	22557	-	-	-	-	-	30611
Karnataka	-	-	9716	26422	7630	-	-	-	-	43768
Kerala	-	-	-	-	71	-	-	-	-	71
Madhya Pradesh	-	-	201	10080	59438	1601	-	-	-	71320
Maharashtra	-	980	34244	2837	235	-	-	-	79932	118228
Orissa	-	-	23207	6552	8632	-	-	-	-	38391
Tamil Nadu	-	-	-	7821	10378	-	-	-	-	18199

**Table - 8 : Prices of Bauxite, 2005-06 to 2007-08**  
(Domestic Markets)

(In Rs. per tonne)

Grade	Market	2005-06	2006-07	2007-08(p)
40% to 45%	Ex-mine Palakhada (Gujarat)	200	200	255
45% to 50%	Ex-mine Palakhada (Gujarat)	200	200	255
Non-plant	Ex-mine Vastrapur (Gujarat)	365	365	365
Metal Grade	Ex-mine Lohardaga (Jharkhand)	245	349.25	349.25
Metal Grade	Ex-mine Lohardaga (Jharkhand)	200	200	200
Grade (Al <sub>2</sub> O <sub>3</sub> 45% to 50%)	Ex-mine Lohardaga (Jharkhand)	254.48	349.25	-
Grade (Al <sub>2</sub> O <sub>3</sub> 40% to 45%)	Ex-mine Lohardaga (Jharkhand)	-	-	484.81
Metal Grade	Ex-mine Barima Mainpat (Chhattisgarh)	173.25	-	263.12
42-45% Al <sub>2</sub> O <sub>3</sub>	f.o.r. Barbil (Orissa)	501	533	-

## MINING & TRANSPORT

The mining of bauxite is carried out by opencast method. The mines are classified in the following three categories depending upon the level of mechanisation.

- (i) Manually-operated mines;
- (ii) Semi-mechanised mines;
- (iii) Mechanised mines.

### Manually-operated Mines

Many bauxite mines are small, producing less than 25,000 tpy. The entire work of overburden removal, extraction of bauxite and loading of bauxite in trucks is carried out manually and the bauxite is transported to respective railway siding or plants by road.

### Semi-mechanised Mines

In semi-mechanised mines, mining operations are carried out by Jackhammer drilling and normally ANFO mixture is used as an explosive for blasting in mineralised zone as well as in overburden, if required. Loading of mineral to trucks or dumpers is done by payloaders or manually. Since bauxite occurs as small lenses or pockets of boulders or as segregations in murrum and laterite, it is difficult to mechanise the mining operations.

### Mechanised Mines

Mechanised mining operations are carried out in a few captive mines of the alumina/aluminium plants. In these mines, use of compressed-air drills for drilling blastholes is made. Sometimes, compressed-air jackhammer drills are also used for drilling blastholes for secondary blasting of boulders and also in toe drilling in irregular bauxite faces which result due to improper fragmentation of bauxite. The blasted overburden/ore materials are handled and transported separately by using shovels or excavators and trucks/dumpers. Separate benches are maintained for the overburden and ores. The height of benches in ore varies from 1.5 to 7.5 m. Hindalco has done away with drilling and blasting at its

Durgmanwadi mines in Maharashtra by using state-of-the-art ripper dozer which is regarded as "Miner's Plough". A ripper dozer silently ploughs the mine surface to extract the mineral. It has totally eliminated the ground vibrations and air pollution normally caused by dust, gases and noise.

In Bagru Hill mines of Hindalco in Jharkhand, the blasted bauxite is transported with the help of dumpers to the crusher. The 4-inch crushed bauxite is then transported to Lohardaga railway station by a monocable aerial ropeway.

BALCO also has monocable ropeway for transporting bauxite from its captive mines to the alumina plant at Korba in Chhattisgarh.

Computerised mine planning, use of mobile crusher, simultaneous land reclamation, restricting operations to small portions of mining area at a time, etc. have greatly helped in conserving energy and faster land rehabilitation.

In NALCO, the mechanised 'Trench method' of opencast mining is adopted. In this method, a pilot trench is driven through the mid deposit and several other trenches are opened on both the sides in a staggered pattern exposing and creating more number of working fronts. The fertile top soil is preserved by dozing aside and hard laterite of 3-m thickness is drilled and blasted. The overburden is removed using higher capacity mobile equipment like dumpers and wheel loaders to expose the bauxite bed.

The top slice of bauxite, having 8-10 m thickness, is loosened by drilling and blasting and the bauxite of 3-4 m thickness at the bottom contact is removed selectively using backhoe shovels. The mine of 2.4 million tpy bauxite production capacity has, after expansion, achieved overall capacity of 4.8 million tonnes. Accordingly, higher capacity mobile equipment like dumpers, wheel loaders, ripper dozers and faster drills have been introduced. NALCO is planning further to increase bauxite mining capacity to 6.3 million tonnes under 2<sup>nd</sup> phase expansion.

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**CONSUMPTION**

In 2007-08, reported consumption of bauxite increased to 10.63 million tonnes from 10.38 million tonnes in the previous year. Alumina/aluminium industry was the principal consumer of bauxite, accounting for 91% consumption in 2007-08 followed by cement (6%) and refractory (2%) (Table -9).

Gujarat was the main supplier of chemical, abrasive and refractory grade bauxite. Alumina plants draw supplies mostly from their captive mines as given in Table - 10.

**USES & SPECIFICATIONS**

Aluminium industry normally uses bauxite containing minimum 58% Al<sub>2</sub>O<sub>3</sub>. However, slightly inferior grades with a suitable blend are also used, depending upon other characteristics, such as solubility in caustic soda and absence of silica. The IS : 5953-1985 (Reaffirmed 2003) specifications for metallurgical grade bauxite are given in Table-11.

**Table - 9 : Reported Consumption of Bauxite\*, 2005-06 to 2007-08  
(By Industries)**

(In tonnes)			
Industry	2005-06 (R)	2006-07	2007-08 (p)
<b>All Industries</b>	<b>11301100</b>	<b>10382100</b>	<b>10627600</b>
Abrasives	4200 (5)	4200 (5)	4200 (5)
Alumina <sup>1/</sup>	10469700 (4)	9370300 (4)	9688200 (4)
Cement	516400 (24)	693400 (24)	614200 (24)
Ceramic	100 (3)	100 (3)	100 (3)
Chemical	6800 (3)	6800 (3)	6500 (3)
Ferro-alloys	4900 (3)	7600 (3)	13500 (3)
Fertilizer	18200 (2)	18200 (2)	18200 (2)
Iron & steel	1200 (7)	1200 (7)	1200 (7)
Refractory <sup>2/</sup>	279600 (56)	280300 (58)	281500 (58)

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

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

*\* Excludes industrial end-use consumption of laterite which was 1,975,411 tonnes, 2,183,316 tonnes and 2,429,372 tonnes during 2005-06, 2006-07 and 2007-08, respectively.*

*<sup>1/</sup> Includes about 6,768 thousand tonnes, 8,453 thousand tonnes and 9,504 thousand tonnes bauxite equivalent of alumina estimated to have been consumed in the production of aluminium metal in 2005-06, 2006-07 and 2007-08, respectively.*

*<sup>2/</sup> Includes consumption of calcined bauxite.*

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**Table - 10 : Domestic Sources of Supplies of Bauxite to Alumina Plants**

Producer	Plant	Source of supply
NALCO	Damanjodi, Koraput (Orissa)	Captive mines at Panchpatmali Hills, Koraput dist., Orissa.
BALCO	Korba (Chhattisgarh)	Captive mines in Surguja & Bodai-Daldali in Kawardha (Kabirdham) districts Chhattisgarh.
Hindalco	Renukoot (Uttar Pradesh)	Captive mines in Shahdol dist., Madhya Pradesh, Gumla and Lohardaga dist., Jharkhand and Surguja dist. in Chhattisgarh and other suppliers in Orissa, Madhya Pradesh and Jharkhand; Katni Bauxite Pvt. Ltd, Satna, Laxmidasji Ramji, Katni, Minerals & Minerals Corp., Gujarat.
	Belgaum (Karnataka) Muri, Ranchi (Jharkhand)	Captive mines in Chandgad and Durgmanwadi, Kolhapur dist. Maharashtra and Lohardaga dist., Jharkhand.
MALCO	Mettur (Tamil Nadu)	Captive mines at Yercaud and Kolli, Salem dist. Tamil Nadu.

**Table - 11 : Specifications for Metallurgical Grade Bauxite**

(IS : 5953-1985; Reaffirmed 2003)

( In % by weight)

Constituent	Gr. I (essentially gibbsite or trihydrate)	Gr. II * (mixture of gibbsite, boehmite and diaspor or trihydrate & monohydrate)
Total Al <sub>2</sub> O <sub>3</sub> , min	40	47
Total available alumina, min	36	43
Total SiO <sub>2</sub> , max	4	4
Module Al <sub>2</sub> O <sub>3</sub> /SiO <sub>2</sub> , min	12	12
Fe <sub>2</sub> O <sub>3</sub> / TiO <sub>2</sub> , max	30	30
P <sub>2</sub> O <sub>5</sub> , max	0.20	0.20
V <sub>2</sub> O <sub>5</sub> , max	0.20	0.20
Loss on ignition at 1100°C	20	20

\* Normally, 1 to 20% diaspor and 5 to 7% boehmite.

In steel industry, bauxite is used as a slag corrector in place of fluorspar. Steel industry consumes bauxite, containing 45 to 54% Al<sub>2</sub>O<sub>3</sub> and 5% SiO<sub>2</sub> (max). Size preference is 25 to 125 mm with a tolerance of 5% (max) for -25 mm and +100 mm fractions.

The BIS has prescribed the following specifications for bauxite in refractory industry (Table-12).

**Table - 12 : IS Specifications of Bauxite for Refractory Industry**

(IS : 10817-1984; Reaffirmed 2000)

Constituent	Percent
Al <sub>2</sub> O <sub>3</sub>	58 min
Fe <sub>2</sub> O <sub>3</sub>	3 max
TiO <sub>2</sub>	3 max
CaO	0.5 to 0.6
LOI	27 to 30

The refractory manufacturers use bauxite of the following specifications:

**Specifications of Bauxite used by Refractory Industry**

Constituent	Percent
Al <sub>2</sub> O <sub>3</sub>	55-60
Fe <sub>2</sub> O <sub>3</sub>	4-6
TiO <sub>2</sub>	5-8
SiO <sub>2</sub>	2
Others	25-40
PCE	33-36 (Ortan)

The IS specifications of bauxite for consumption in chemical and petroleum industries are given in Table - 13.

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**Table - 13 : IS Specifications of Bauxite for  
Chemical and Petroleum Industries**  
(IS : 3605-1984; Reaffirmed 2003)

Constituent	Requirement
Alumina (as Al <sub>2</sub> O <sub>3</sub> ), % by mass, min	58.0
Silica (as SiO <sub>2</sub> ), % by mass, max	3.0
Iron oxide (as Fe <sub>2</sub> O <sub>3</sub> ), % by mass, max	2.0
Titania (as TiO <sub>2</sub> ), % by mass, max	4.0
Phosphorus pentoxide (as P <sub>2</sub> O <sub>5</sub> ), % by mass, max	0.3
Manganese dioxide (as MnO), % by mass, max	0.1
Calcium and magnesium (as CaO), % by mass, max	2.0
Loss on ignition, % by mass, max	32.0

Apart from the chemical specifications, the physical requirements are that the material passing through 90-micron IS sieve but retained on 212-micron IS sieve should be 90% max, that passing through 300-micron IS sieve shall be 1% by mass max and that passing through 212- micron IS sieve but retained on 300-micron IS sieve should be 10% maximum.

### SUBSTITUTION

There is no substitute of bauxite for aluminium metal extraction on a large scale. However, calcined clay can be substituted for refractory bauxite but only with reduction in length of time and stock resistance. Sillimanite, alumina, silicon carbide, magnesite-chromite and carbon-magnesite refractories are the alternatives for high-alumina material but at higher cost. Silicon carbide and diamonds can substitute for fused aluminium oxide in abrasive use but again at higher cost. Synthetic mullite substitutes for bauxite-based refractories. Silicon carbide and alumina-zirconia are costlier substitutes for bauxite-based abrasives.

### TRADE POLICY

As per the Foreign Trade Policy for 2004-2009, and policy on export and import effective from 01.04.2008, exports and imports of bauxite are permitted freely.

## WORLD REVIEW

The bauxite reserve base is estimated at 32,000 million tonnes, located mainly in Guinea (27%), Australia (25%), Brazil and Jamaica (8% each), China (7%) and India (4%). Countrywise reserve base of bauxite is given in Table - 14.

The world production of bauxite was estimated at 213 million tonnes in 2007. Australia continued to be the major producer accounting for 29% share in total production, followed by Brazil (12%), India (11%), China (10%), Guinea (9%), and Jamaica (7%) (Table -15).

**Table - 14 : World Resources of Bauxite  
(By Principal Countries)**

Country	Reserve base (In '000 tonnes)
<b>World : Total</b>	<b>32000000</b>
Australia	7900000
Brazil	2500000
China	2300000
Greece	650000
Guinea	8600000
Guyana	900000
India*	1400000
Jamaica	2500000
Kazakhstan	450000
Russia	250000
Suriname	600000
USA	40000
Venezuela	350000
Other countries	4000000

*Source: Mineral Commodity Summaries, 2008.*

*\* However, the total resources of bauxite as per UNFC System as on 01.04.2005 are estimated at 3,290 million tonnes.*

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**Table - 15 : World Production of Bauxite  
(By Principal Countries)**

(In '000 tonnes)			
Country	2005	2006	2007
<b>World: Total</b>	<b>178000</b>	<b>193000</b>	<b>213000</b>
Australia	59959	61781	62428
Brazil	22365	23236	25461
China	17408	18982	21600 <sup>(e)</sup>
Greece	2441	2163	2220 <sup>(e)</sup>
Guinea	19237	18184	18519
Guyana	1694	1479	2249
India*	12596	15661	22999
Jamaica	14116	14865	14568
Kazakhstan	4815	4884	4963
Russia	6409	6399	6054
Suriname	4757	4945	5273
Venezuela	5900	5928	5000 <sup>(e)</sup>
Other countries	6303	14493	21666

*Source: World Mineral production, 2003-2007.*

\* India's production of bauxite during 2005-06, 2006-07 and 2007-08 was 12,596 thousand tonnes, 15,733 thousand tonnes and 23,085 thousand tonnes, respectively.

### Australia

Since over three decades, Australia continued to be the leader in the production of bauxite with 61.8 million tonnes production. The production was mainly from five mines namely Huntly, Weipa, Gove, Willowdale and Mt. Saddleback. Huntly was the single largest mine in the world with 18 million tonnes production in 2006. The expansion of Huntly and Weipa has resulted in increase in Australian production. The Government of Queensland chose Aluminium Corporatin of China Ltd (Chalco) to develop 650 million tonnes Aurukun bauxite deposit on Cape York Peninsula. The production from this deposit is expected in 2011. Australia has six alumina refineries and six aluminium smelters.

### Brazil

Brazil, the second largest producer of bauxite, recorded production at about 23.8 million tonnes in 2006. The Trombetas mine in Amazonas accounted for about 81% of the total production of Mineracao Rio do Norte (MRN) which is a joint venture company. The production is expected to increase significantly in the next few years as a

number of new mine project is underway. The Paragominas bauxite mine capacity will be raised to 9.9 million tonnes per year by 2008. The mine will supply feed for expansion of Alunorte's alumina refinery.

### China

Almost all production of bauxite came from mines owned and operated by China Aluminium Corp. (Chalco). The majority of bauxite deposits are diasporic in nature with high silica to alumina ratios. Chinese refineries predominantly use a combined Bayer-Sinter process. Chalco intends to add 3-5 million tonnes per year alumina capacity by 2010.

### Guinea

Guinea is the third largest producer of bauxite. There are three principal producers CBG, ACG and CBK. The Government has formed Alumina Co. of Guinea (ACG) to operate the 2.3 million tpy Fria bauxite mine captive to its alumina refinery. The Russian Aluminium Company RUSAL took a majority stake in ACG and operates the Fria Kimbo bauxite mine. Boke' Complex is the

## BAUXITE

largest mining area producing about 71% of country's output and Mt. Sangaredi is the largest mine in the Boke' Complex. The Government of Guinea reached an agreement with Halco to allow Global Alumina access to concessions in Boke region. Bauxite will be supplied to its 3 million tonnes per year greenfield alumina refinery.

### Jamaica

Jamaica reported the highest production at about 15 million tonnes of bauxite in 32 years. Kaiser Jamaica Bauxite Co (KJBC) jointly owned by Kaiser Aluminium and Government of Jamaica, operates its bauxite mine on the North Coast. The mine has a capacity of 4.5 million tonnes bauxite per annum. Mines expansion is going on and output is expected to increase in the next few years.

### Venezuela

The entire production at about 5.5 million tonnes comes from CVG Bauxilum's Los Pijiguas mining complex.

**Table - 16 : Exports of Bauxite  
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
<b>All Countries</b>	<b>5073894</b>	<b>7422155</b>	<b>7120899</b>	<b>11792383</b>
China	1280489	1884537	3640291	5850423
Chinese Taipei/ Taiwan	713095	1218839	1082521	2155556
Georgia	382581	432061	635589	1019304
UAE	291208	274975	424587	486931
Saudi Arabia	586840	1155078	385243	470981
Bangladesh	140491	188375	189751	450944
Kuwait	133071	165564	93684	258668
Japan	189458	311913	100160	152505
Romania	207662	270729	2000	19470
Unspecified	266350	402114	361294	522204
Other countries	882649	1117970	205779	405397

## FOREIGN TRADE

### Exports

Exports of bauxite increased substantially to 7.12 million tonnes in 2007-08 from 5.07 million tonnes in 2006-07. Exports were mainly to China (51%) followed by Chinese Taipei/Taiwan (15%), Georgia (9%) UAE (6%) and Saudi Arabia (5%) (Table - 16).

### Imports

In 2007-08, imports of bauxite also increased substantially to 122,911 tonnes from 47,138 tonnes in the previous year. Imports were mostly from China and Australia (Table - 17).

**Table - 17 : Imports of Bauxite  
(By Countries)**

Country	2006-07		2007-08	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
<b>All Countries</b>	<b>47138</b>	<b>403707</b>	<b>122911</b>	<b>873447</b>
China	46777	391134	80462	733964
Australia	-	-	41681	131847
Netherlands	178	3185	180	3473
Pakistan	-	-	424	2095
Germany	-	-	97	855
Guyana	-	-	21	336
France	-	-	24	318
UK	-	-	19	305
USA	182	9339	2	212
Japan	-	-	1	37
Other countries	1	49	++	5

## FUTURE OUTLOOK

The country has large resources of bauxite, occupying the sixth place in the world total resources. The resources of metallurgical grade bauxite are quite adequate while those of the chemical and refractory grade bauxite are relatively limited considering the future requirements. With the abundance of bauxite resources, Eastern Ghat region of Orissa and Andhra Pradesh are likely to be the hubs for bauxite mining activities in future. In view of the abundance of metallurgical grade resources, there is scope for increasing mining of bauxite of this grade with implementation of Mega Projects. The refractory and chemical grade bauxite can be preserved for future use.