

BAUXITE



Indian Minerals Yearbook 2017

(Part- III : Mineral Reviews)

56th Edition

BAUXITE

(ADVANCE RELEASE)

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

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March, 2018

3 Bauxite

Bauxite is basically an aluminous rock that contains hydrated aluminium oxide as main constituent and iron oxide, silica & titania as minor constituents present in varying proportions. Hydrated aluminium oxides present in the bauxite ore are diasporite and boehmite, $Al_2O_3 \cdot H_2O$ (Al_2O_3 -85%; Al-45%); gibbsite or hydrargillite, $Al_2O_3 \cdot 3H_2O$ (Al_2O_3 -65.4%; Al-34.6%), and bauxite (containing colloidal alumina hydrogel), $Al_2O_3 \cdot 2H_2O$ (Al_2O_3 -73.9%; Al-39.1%). The iron oxide in bauxite ore is present as haematite or goethite; silica as clay; and free quartz & titania as leucosene or rutile. Bauxite is the principal 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 3,896 million tonnes of resources of bauxite which is sufficient to meet both domestic and export demands.

RESERVE/RESOURCES

Reserve/Resources of bauxite in the country as on 1.4.2015, as per NMI database, based on UNFC system have been placed at 3,896 million tonnes. These resources include 656 million tonnes Reserves and 3,240 million tonnes Remaining Resources. By grades, about 77% resources are of Metallurgical grade. The resources of Refractory and Chemical grades are limited and together account for about 4%. By States, Odisha alone accounts for 51% of country's resources of bauxite followed by Andhra Pradesh (16%), Gujarat (9%), Jharkhand (6%), Maharashtra (5%) and Madhya Pradesh & Chhattisgarh (4% each). Major bauxite resources are concentrated in the East Coast bauxite deposits in Odisha and Andhra Pradesh (Table-1).

EXPLORATION & DEVELOPMENT

The exploration & development details are given in the review of "EXPLORATION & DEVELOPMENT" in "GENERAL REVIEWS".

PRODUCTION, STOCKS & PRICES

The production of bauxite at 24,665 thousand tonnes in 2016-17 decreased by 12% as compared to the previous year.

There were 157 reporting mines in 2016-17 as against 190 in the previous year. Besides, 7 mines have reported production of bauxite as associated mineral during the year. In all, 70 producers reported production of bauxite in 2016-17. Ten principal producers having 50 mines contributed 86% of the total production. Fifty Six (56) major mines, including one associated mine each producing more than 50 thousand tonnes

per annum, together accounted for 96% of the total production.

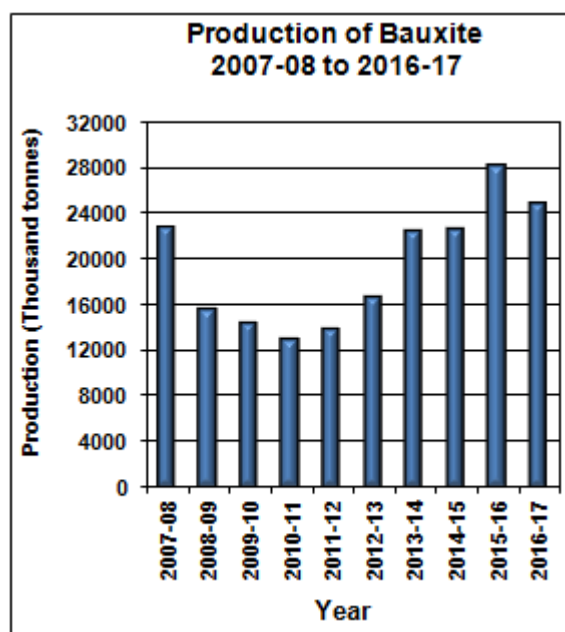
The share of Public Sector mines was about 31 % of the total production in 2016-17, as against 24 per cent in the previous year.

About 61 % of the total production of bauxite was of 40-45% Al_2O_3 grade, 25% was of Cement grade, 7% was of 45-50% Al_2O_3 grade, 4% was of below 40% Al_2O_3 and the remaining 3% of production was of grades that included 50-55% Al_2O_3 , Abrasive, Refractory and Chemical during the year under review.

Odisha emerged as the leading producing State accounting for about 49% of the total production followed by Gujarat (24%), Jharkhand (9%), Chhattisgarh and Maharashtra (8% each). The remaining was produced by Madhya Pradesh, Goa, Karnataka and Tamil Nadu (Tables -2 to 5).

Mine-head closing stocks of bauxite in 2016-17 was 16,262 thousand tonnes as compared to 14,093 thousand tonnes in the previous year. About 89% of total stock was held in Gujarat at the end of the year (Tables- 6 'A' & 'B').

The average daily employment of labour in bauxite mines was 6,029 in 2016-17 as against 8,652 in the previous year.



BAUXITE

**Table – 1 : Reserves/Resources of Bauxite as on 1.4.2015
(By Grades/States)**

(In '000 tonnes)

| Grade/State | Reserves | | | | Remaining Resources | | | | | Total Resources (A+B) | | | |
|--|------------------|--------------|---------------|---------------|-----------------------|-----------------|---------------|--------------------|---------------------|-----------------------|--------------------|--------------------------|----------------|
| | Proved STD111 | Probable | | Total (A) | Feasibility STD211 | Pre-feasibility | | Measured STD331 | Indicated STD332 | | Inferred STD333 | Reconnaissance STD334 | Total (B) |
| | | STD121 | STD122 | | | STD221 | STD222 | | | | | | |
| All India : Total By Grades | 434043 | 18599 | 203780 | 656422 | 254378 | 132633 | 382369 | 710878 | 430890 | 1209706 | 119588 | 3240442 | 3896864 |
| Chemical | 6844 | - | 52 | 6896 | 276 | 4584 | 411 | 3018 | 182 | 4922 | - | 13393 | 20289 |
| Refractory | 58239 | - | 8919 | 67158 | 637 | 12439 | 45808 | 7267 | 734 | 10496 | 489 | 77870 | 145027 |
| Chemical/Refractory Mixed with others | 3546 | 139 | 742 | 4426 | 1184 | 2218 | 205 | 2970 | 216 | 8484 | - | 15278 | 19704 |
| Metallurgical-1 | 266825 | 6241 | 166026 | 439093 | 186793 | 54042 | 270125 | 450564 | 292022 | 669230 | 19573 | 1942349 | 2381442 |
| Metallurgical-2 | 44140 | 501 | 655 | 45296 | 28908 | 20698 | 35585 | 105661 | 67906 | 310738 | 22520 | 592016 | 637312 |
| Metallurgical mixed | 9897 | 26 | 5157 | 15080 | 5051 | 3841 | 2518 | 53969 | - | 28799 | 17340 | 111518 | 126598 |
| Low Grade | 19779 | 11167 | 9870 | 40816 | 11769 | 4803 | 19569 | 23447 | 54837 | 119307 | 48190 | 281922 | 322738 |
| Beneficiable | - | - | - | - | - | - | - | 55096 | - | - | - | 55096 | 55096 |
| Mixed grade Excluding Chem./Refrac. | 16993 | 232 | 2000 | 19225 | 5285 | 7507 | 6824 | 6839 | 4370 | 13266 | - | 44092 | 63317 |
| Abrasive | 651 | - | 70 | 721 | 28 | 805 | 123 | 92 | 56 | 961 | 840 | 2906 | 3627 |
| Others | 3347 | 97 | 8241 | 11685 | 3856 | 143 | 1097 | 1949 | 4848 | 10997 | 1545 | 24435 | 36120 |
| Unclassified | 3545 | 196 | 2048 | 5789 | 10183 | 21540 | 105 | - | 5720 | 11039 | 8954 | 57540 | 63329 |
| Not-Known | 236 | - | - | 236 | 407 | 12 | - | 5 | - | 21465 | 138 | 22027 | 22263 |
| By States | | | | | | | | | | | | | |
| Andhra Pradesh | - | - | - | - | - | - | - | 188971 | 138120 | 288176 | - | 615267 | 615267 |
| Bihar | - | - | - | - | - | - | - | - | - | 4114 | - | 4114 | 4114 |
| Chhattisgarh | 12537 | 218 | 2313 | 15068 | 15341 | 4570 | 46389 | 37264 | 12892 | 23483 | 18747 | 158687 | 173755 |
| Goa | 12357 | - | 1207 | 13564 | 14919 | 1097 | 10121 | 6820 | - | 8646 | - | 41603 | 55168 |
| Gujarat | 154911 | 2094 | 28229 | 185234 | 17324 | 35470 | 3925 | 28953 | 22107 | 56857 | 710 | 165347 | 350381 |
| Jammu & Kashmir | - | - | - | - | - | - | - | 1323 | 182 | 1220 | - | 2725 | 2725 |
| Jharkhand | 54471 | 219 | 8049 | 62740 | 9734 | 6154 | 15117 | 17883 | 17397 | 54106 | 55930 | 176321 | 239061 |
| Karnataka | 126 | 1123 | 3140 | 4389 | 2468 | 864 | 10 | 82 | 2220 | 35603 | - | 41246 | 45635 |
| Kerala | - | - | - | - | 29 | - | 24 | 2037 | 9284 | 2722 | - | 14096 | 14096 |
| Madhya Pradesh | 11979 | 3313 | 8299 | 23591 | 12566 | 15084 | 6013 | 11061 | 54484 | 50590 | - | 149797 | 173388 |
| Maharashtra | 11281 | 11221 | 3686 | 26188 | 15449 | 2064 | 16809 | 39197 | 8367 | 76501 | - | 158386 | 184574 |
| Odisha | 176002 | 441 | 148856 | 325269 | 166547 | 66189 | 280396 | 365938 | 155253 | 590780 | 44202 | 1669305 | 1994574 |
| Rajasthan | - | - | - | - | - | - | - | - | - | 528 | - | 528 | 528 |
| Tamil Nadu | 379 | - | - | 379 | - | 1141 | 3564 | 960 | 10084 | 8363 | - | 24112 | 24491 |
| Uttar Pradesh | - | - | - | - | - | - | - | 10390 | 500 | 8018 | - | 18908 | 18908 |

Figures rounded off.

BAUXITE

Table – 2 : Principal Producers of Bauxite, 2016-17

| Name & address of producer | Location of mine | |
|---|---------------------------|--|
| | State | District |
| National Aluminium Co. Ltd, NALCO Bhawan, P/1, Nayapali Bhubaneshwar-751 013, Odisha. | Odisha | Koraput |
| Utkal Alumina International Ltd, J-6, Jayadev-Vihar, Bhubaneshwar-751 013, Odisha. | Odisha | Rayagada |
| Hindalco Industries Ltd, Century Bhawan, 3rd Floor, Dr. Annie Beasant Road, Worli, Mumbai-400 030, Maharashtra. | Chhattisgarh Jharkhand | Surguja Gumla Latehar Lohardaga Kolhapur |
| Bombay Minerals Ltd, Jamnagar-Dwarka Highway Jam-Khambalia-361 305, Distt. Devbhoomi Dwarka, Gujarat. | Gujarat | Devbhoomi Dwarka |
| Bharat Aluminium Co. Ltd, Aluminium Sadan, Core-6, SCOPE Office Complex, 7 Lodhi Road, New Delhi- 110 003. | Chhattisgarh | Kabirdham Surguja |

(Contd.)

Table- 2 (Concl'd.)

| Name & address of producer | Location of mine | |
|---|------------------|--------------------------------|
| | State | District |
| Minerals & Minerals Corpn, 8/9, Ankur Apartment, Near Motor Park Colony, Jamnagar - 361 001 Gujarat. | Gujarat | Devbhoomi Dwarka |
| Orient Abrasiv Ltd, GIDC Industrial Area, Porbandar-360 577, Gujarat. | Gujarat | Devbhoomi Dwarka Kachchh |
| Gujarat Mineral Development Corp Ltd, Khanij Bhawan, 132 Feet Ring Road, Near University Ground, Vastrapur-380 002, Ahmedabad, Gujarat. | Gujarat | Devbhoomi Dwarka Kachchh |
| Smt Nirmalaben S. Mehta, Jamnagar-Dwarka Highway, Opp. Ashok petrol pump, Jam-Khambhalia - 361 305 Distt. Devbhoomi Dwarka, Gujarat. | Gujarat | Jamnagar |
| Ashapura Minechem Ltd, Jeevan Udyog Building, 3rd floor, 278, D.N. Road, Fort Mumbai- 400 001, Maharashtra. | Maharashtra | Ratnagiri |

Table – 3 : Production of Bauxite, 2014-15 to 2016-17 (P)
(By States)

(Qty in tonnes; Value in ₹'000)

| States | 2014-15 | | 2015-16 | | 2016-17 (P) | |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| India | 22493671 | 11922367 | 28123789 | 15437694 | 24664632 | 14170420 |
| Chhattisgarh | 1560784 | 1164426 | 1991455 | 1314345 | 1954233 | 1336544 |
| Goa | 268500 | 44235 | 163950 | 40960 | - | - |
| Gujarat | 5825628 | 2381970 | 10387092 | 4857172 | 5818467 | 2857981 |
| Jharkhand | 2040519 | 1330002 | 2111227 | 1399189 | 2289825 | 1318549 |
| Karnataka | 127500 | 31875 | 12050 | 5423 | 386 | 171 |
| Madhya Pradesh | 831899 | 526735 | 684288 | 479401 | 658375 | 501600 |
| Maharashtra | 2669408 | 1274425 | 1907543 | 1043950 | 1946042 | 934677 |
| Odisha | 9091061 | 5124105 | 10839038 | 6278252 | 11990035 | 7216087 |
| Tamil Nadu | 78372 | 44594 | 27146 | 19002 | 7269 | 4811 |

(P):Provisional

BAUXITE

Table -4 (A) : Gradewise Production of Bauxite, 2016-17(P)
(By Sectors/States/Districts)

| State/District | For use in Alumina & Aluminium extraction : Al ₂ O ₃ content | | | | | | For use in other than Alumina & Aluminium extraction | | | | | | Total |
|-----------------------|--|--------|--------------|----------------|-----------------|----------------|--|--------------|---------------|---------------|-----------------|-----------------|-------|
| | No. of Mines | 55-60% | 50-55% | 45-50% | 40-45% | Below 40% | Cement | Abrasives | Refractory | Chemical | Quantity | Value | |
| | | 16450 | 1632332 | 15049042 | 1096992 | 6111560 | | | | | | | |
| India | 157(7) | - | 16450 | 1632332 | 15049042 | 1096992 | 6111560 | 84033 | 278358 | 395865 | 24664632 | 14170420 | |
| Public Sector | 17 | - | - | 182549 | 6985580 | - | - | - | 34757 | 377535 | 7580421 | 4586268 | |
| Private Sector | 140(7) | - | 16450 | 1449783 | 8063462 | 1096992 | 6111560 | 84033 | 243601 | 18330 | 17084211 | 9584152 | |
| Chhattisgarh | 13 | - | - | 1174096 | 774724 | 2897 | - | - | 1255 | 1261 | 1954233 | 1336544 | |
| Kabirdham | 3 | - | - | 1117898 | 31359 | 2897 | - | - | - | - | 1152154 | 792392 | |
| Kondagaon | 2 | - | - | - | - | - | - | - | 1255 | 1261 | 2516 | 2260 | |
| Surguja | 8 | - | - | 56198 | 743365 | - | - | - | - | - | 799563 | 541892 | |
| Goa | 1* | - | - | - | - | - | - | - | - | - | 0 | 0 | |
| South Goa | 1* | - | - | - | - | - | - | - | - | - | 0 | 0 | |
| Gujarat | 86 | - | 16450 | 130651 | 73141 | 35 | 4896435 | 84033 | 239028 | 378694 | 5818467 | 2857981 | |
| Amreli | 1 | - | - | - | - | - | 50904 | - | - | - | 50904 | 32735 | |
| Devbhoomi Dwarka | 64 | - | 16450 | - | 60770 | 35 | 4600914 | 84033 | 207700 | - | 4969902 | 2298690 | |
| Kheda | 7 | - | - | - | - | - | 1504 | - | - | - | 1504 | 676 | |
| Kachchh | 9 | - | - | 130651 | 12371 | - | - | - | 31219 | 377535 | 551776 | 391169 | |
| Porbandar | 4 | - | - | - | - | - | 176808 | - | - | - | 176808 | 92698 | |
| Sabarkantha | 1 | - | - | - | - | - | 66305 | - | 109 | 1159 | 67573 | 42013 | |
| Jharkhand | 18 | - | - | 1530 | 1420661 | 862099 | - | - | 5535 | - | 2289825 | 1318549 | |
| Gumla | 12 | - | - | 1530 | 1333091 | - | - | - | 5535 | - | 1340156 | 747357 | |
| Latehar | 1 | - | - | - | 87570 | - | - | - | - | - | 87570 | 47194 | |
| Lohardaga | 5 | - | - | - | - | 862099 | - | - | - | - | 862099 | 523998 | |
| Karnataka | 2 | - | - | - | - | - | 386 | - | - | - | 386 | 171 | |
| Belagavi | 1 | - | - | - | - | - | 386 | - | - | - | 386 | 171 | |
| Dakshina Kannada | 1* | - | - | - | - | - | - | - | - | - | 0 | 0 | |
| Madhya Pradesh | 18(7) | - | - | 3045 | 215565 | 33696 | 357619 | - | 32540 | 15910 | 658375 | 501600 | |
| Anuppur | 1 | - | - | - | 38475 | - | - | - | - | - | 38475 | 31112 | |
| Jabalpur | 2(1) | - | - | 3045 | - | - | 54047 | - | 7840 | - | 64932 | 50028 | |
| Katni | 7(3) | - | - | - | 50 | 32096 | 277533 | - | 19800 | - | 329479 | 241345 | |
| Rewa | 1 | - | - | - | 2140 | - | - | - | - | - | 2140 | 2939 | |
| Satna | 2(3) | - | - | - | - | 1600 | 2239 | - | 3900 | 15910 | 23649 | 23804 | |
| Shahdol | 2 | - | - | - | 174900 | - | - | - | - | - | 174900 | 127472 | |
| Sidhi | 3 | - | - | - | - | - | 23800 | - | 1000 | - | 24800 | 24900 | |
| Maharashtra | 13 | - | - | 323010 | 711981 | 61200 | 849851 | - | - | - | 1946042 | 934677 | |
| Kolhapur | 7 | - | - | 323010 | 525177 | 61200 | 232987 | - | - | - | 1142374 | 640323 | |
| Raigarh | 3 | - | - | - | - | - | 221880 | - | - | - | 221880 | 56536 | |
| Ratnagiri | 3 | - | - | - | 186804 | - | 394984 | - | - | - | 581788 | 237818 | |
| Odisha | 3 | - | - | - | 11852970 | 137065 | - | - | - | - | 11990035 | 7216087 | |
| Koraput | 1 | - | - | - | 6825000 | - | - | - | - | - | 6825000 | 4058890 | |
| Rayagada | 1* | - | - | - | 5027970 | 137065 | - | - | - | - | 5165035 | 3157197 | |
| Sundargarh | 1 | - | - | - | - | - | - | - | - | - | 0 | 0 | |
| Tamil Nadu | 3 | - | - | - | - | - | 7269 | - | - | - | 7269 | 4811 | |
| Namakkal * | 2* | - | - | - | - | - | - | - | - | - | 0 | 0 | |
| Salem | 1 | - | - | - | - | - | 7269 | - | - | - | 7269 | 4811 | |

Figures in parentheses indicate number of associated mines.

*: Only labour reported

BAUXITE

Table - 4 (B) : Gradewise Production of Bauxite, 2015-16 (P)
(By Sectors/States/Districts)

| State/District | For use in Alumina & Aluminium extraction : Al ₂ O ₃ content | | | | | For use other than Alumina & Aluminium extraction | | | | | (Qty in tonnes; Value in ₹'000) | |
|-----------------------|--|--------------|----------------|----------------|---------------|---|---------------|---------------|--------------|-----------------|---------------------------------|-------|
| | No. of Mines | 50-55% | 45-50% | 40-45% | Below 40% | Cement | Abrasive | Refractory | Chemical | Quantity | Value | Total |
| | | 16150 | 3034157 | 13760447 | 859016 | | | | | | | |
| India | 190(5) | | | | | | | | | | | |
| Public Sector | 18 | - | 1726276 | 4873890 | - | - | - | - | 1775 | 6620334 | 3802432 | |
| Private Sector | 172(5) | 16150 | 1307881 | 8886557 | 859016 | 9864340 | 259287 | 276155 | 34069 | 21503455 | 11635262 | |
| Chhattisgarh | 11 | - | 1044684 | 946771 | - | - | - | - | - | 1991455 | 1314345 | |
| Kabirdham | 3 | - | 994857 | 89700 | - | - | - | - | - | 1084557 | 730630 | |
| Surguja | 8 | - | 49827 | 857071 | - | - | - | - | - | 906898 | 583715 | |
| Goa | 1 | - | - | 163750 | - | 200 | - | - | - | 163950 | 40960 | |
| South Goa | 1 | - | - | 163750 | - | 200 | - | - | - | 163950 | 40960 | |
| Gujarat | 115 | 16150 | 75500 | 620204 | 15 | 9156188 | 259287 | 215649 | 44099 | 10387092 | 4857172 | |
| Amreli | 1 | - | - | - | - | 4757 | - | - | - | 4757 | 3592 | |
| Devbhoomi Dwarka | 91 | 16150 | 75500 | 620204 | 15 | 8756338 | 259287 | 215649 | 26324 | 9969467 | 4590219 | |
| Kheda | 7 | - | - | - | - | 20793 | - | - | - | 20793 | 8489 | |
| Kachchh | 9 | - | - | - | - | 105050 | - | - | 1775 | 122825 | 45485 | |
| Porbandar | 6 | - | - | - | - | 236585 | - | - | - | 236585 | 182471 | |
| Sabarkantha | 1 | - | - | - | - | 32665 | - | - | - | 32665 | 26916 | |
| Jharkhand | 19 | - | - | 1414039 | 654023 | - | - | 43165 | - | 2111227 | 1399189 | |
| Gumla | 12 | - | - | 1319749 | - | - | - | 43165 | - | 1362914 | 871400 | |
| Latehar | 1 | - | - | 94290 | - | - | - | - | - | 94290 | 67323 | |
| Lohardaga | 6 | - | - | - | 654023 | - | - | - | - | 654023 | 460466 | |
| Karnataka | 2 | - | - | - | - | 12050 | - | - | - | 12050 | 5423 | |
| Belagavi | 1 | - | - | - | - | 12050 | - | - | - | 12050 | 5423 | |
| Dakshin Kannada * | 1* | - | - | - | - | - | - | - | - | 0 | 0 | |
| Madhya Pradesh | 22(5) | - | 14854 | 239148 | 143402 | 259405 | - | 19734 | 7745 | 684288 | 479401 | |
| Anuppur | 1 | - | - | 46150 | - | - | - | - | - | 46150 | 37151 | |
| Jabalpur | 1(1) | - | - | - | - | 23400 | - | 2700 | - | 26100 | 17156 | |
| Katni | 7(3) | - | 14854 | 12783 | 132550 | 218775 | - | 3984 | - | 382964 | 240497 | |
| Rewa | 4 | - | - | 5350 | 63 | - | - | - | - | 5413 | 4939 | |
| Sama | 4(1) | - | - | - | 10789 | 17230 | - | - | 7745 | 35764 | 21046 | |
| Shahdol | 2 | - | - | 174865 | - | - | - | - | - | 174865 | 128192 | |
| Sidhi | 3 | - | - | - | - | - | - | 13050 | - | 13050 | 30420 | |
| Maharashtra | 13 | - | 224100 | 1243155 | 30937 | 409351 | - | - | - | 1907543 | 1043950 | |
| Kolhapur | 7 | - | 224100 | 687601 | - | 147485 | - | - | - | 1059186 | 606438 | |
| Raigarh | 3 | - | - | 555554 | 30937 | 34866 | - | - | - | 227000 | 63560 | |
| Ramagiri | 3 | - | - | 9133380 | 30639 | - | - | - | - | 621357 | 373952 | |
| Odisha | 4 | - | 1675019 | 9133380 | 30639 | - | - | - | - | 10839038 | 6278252 | |
| Koraput | 2 | - | 1675019 | 4665123 | - | - | - | - | - | 6340142 | 3632901 | |
| Rayagada | 1 | - | - | 4468257 | 30639 | - | - | - | - | 4498896 | 2645351 | |
| Sundargarh* | 1* | - | - | - | - | - | - | - | - | 0 | - | |
| Tamil Nadu | 3 | - | - | - | - | 27146 | - | - | - | 27146 | 19002 | |
| Namakkal * | 2* | - | - | - | - | - | - | - | - | 0 | 0 | |
| Salem | 1 | - | - | - | - | 27146 | - | - | - | 27146 | 19002 | |

Figures in parentheses indicate number of associated mines. * Only labour reported.. * Only labour reported.

BAUXITE

**Table – 5 : Production of Bauxite, 2015-16 and 2016-17 (P)
(By Frequency Groups)**

(Qty in tonnes)

| Production group | No. of mines | | Production for the group | | Percentage to total production | | Cumulative percentage | |
|------------------|---------------|---------------|--------------------------|-----------------|--------------------------------|---------------|-----------------------|-------------|
| | 2015-16 | 2016-17 (P) | 2015-16 | 2016-17 (P) | 2015-16 | 2016-17 (P) | 2015-16 | 2016-17 (P) |
| Total | 190(5) | 157(7) | 28123789 | 24664632 | 100.00 | 100.00 | - | - |
| Up to 1000 | 65 | 39(1) | 2190 | 4909 | 0.01 | 0.02 | 0.01 | 0.02 |
| 1001 - 3000 | 6 | 10(1) | 12843 | 21475 | 0.05 | 0.09 | 0.06 | 0.11 |
| 3001 - 5000 | 7 | 7 | 28188 | 27933 | 0.10 | 0.11 | 0.16 | 0.22 |
| 5001 - 10000 | 17(1) | 14 | 139443 | 103512 | 0.50 | 0.42 | 0.66 | 0.64 |
| 10001 - 25000 | 19(2) | 19(3) | 320788 | 341870 | 1.14 | 1.38 | 1.80 | 2.02 |
| 25001 - 50000 | 16 | 12(1) | 656337 | 507477 | 2.33 | 2.06 | 4.13 | 4.08 |
| 50001 and above | 60(2) | 56(1) | 26964000 | 23657456 | 95.87 | 95.92 | 100.00 | 100.00 |

Figures in parentheses indicate number of associated mines.

**Table – 6 (A) : Mine-head Closing Stocks of Bauxite, 2015-16
(By States & Grades)**

(Qty in tonnes)

| State | For use in Alumina & Aluminium metal Extraction Al_2O_3 Content | | | | | | For use other than Alumina & Aluminium metal extraction | | | | |
|----------------|---|--------|-------------|---------------|----------------|---------------|---|---------------|---------------|--------------|-----------------|
| | 60% & above | 55-60% | 50-55% | 45-50% | 40-45% | Below 40% | Cement | Abrasive | Refractory | Chemical | Total |
| India | - | - | 4625 | 855693 | 1150864 | 657292 | 10747503 | 423596 | 155828 | 97570 | 14092971 |
| Chhattisgarh | - | - | - | 5182 | 1611 | 337 | - | 95 | - | - | 7225 |
| Goa | - | - | - | - | 4020 | - | 18170 | - | - | - | 22190 |
| Gujarat | - | - | 1679 | 696931 | 856814 | 20973 | 10380996 | 420181 | 142149 | 74868 | 12594591 |
| Jharkhand | - | - | - | 486 | 41544 | 98886 | - | - | 426 | - | 141342 |
| Karnataka | - | - | - | - | 19296 | - | 8614 | - | - | - | 27910 |
| Madhya Pradesh | - | - | - | 13296 | 58704 | 377772 | 145427 | - | 13253 | 22702 | 631154 |
| Maharashtra | - | - | 2946 | 126609 | 146959 | 136657 | 179313 | - | - | - | 592484 |
| Odisha | - | - | - | 13189 | 21916 | 11210 | - | - | - | - | 46315 |
| Tamil Nadu | - | - | - | - | - | 11457 | 14983 | 3320 | - | - | 29760 |

BAUXITE

Table – 6 (B) : Mine-head Stocks of Bauxite at the End of the Year 2016-17 (P)
(By States & Grades)

(In tonnes)

| State | For use in alumina & aluminium metal extraction Al ₂ O ₃ Content | | | | | For use other than alumina & aluminium metal extraction | | | | |
|----------------|--|-------------|---------------|----------------|---------------|---|---------------|---------------|---------------|-----------------|
| | 60% & above | 50-55% | 45-50% | 40-45% | Below 40% | Cement | Abrasive | Refractory | Chemical | Total |
| India | - | 3499 | 579941 | 1275927 | 573880 | 12949152 | 424410 | 214804 | 240740 | 16262353 |
| Chhattisgarh | - | - | 4397 | 6423 | - | - | 95 | 1255 | 1261 | 13431 |
| Goa | - | - | - | 4020 | - | 18170 | - | - | - | 22190 |
| Gujarat | - | 553 | 473516 | 800507 | 335 | 12382788 | 420995 | 186966 | 218073 | 14483733 |
| Jharkhand | - | - | 63 | 40167 | 59631 | - | - | 440 | - | 100301 |
| Karnataka | - | - | - | 19296 | - | 9000 | - | - | - | 28296 |
| Madhya Pradesh | - | - | 4420 | 37479 | 387262 | 165640 | - | 26143 | 21406 | 642350 |
| Maharashtra | - | 2946 | 84356 | 346120 | 103985 | 358571 | - | - | - | 895978 |
| Odisha | - | - | 13189 | 21915 | 11210 | - | - | - | - | 46314 |
| Tamil Nadu | - | - | - | - | 11457 | 14983 | 3320 | - | - | 29760 |

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 and produce less than 25,000 tpy. The entire work of overburden removal, extraction of bauxite and loading of bauxite on to 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 jack hammer 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 onto trucks or dumpers is done by payloaders or manually. Since bauxite occurs as small lenses or pockets or 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. These mines use compressed-air drills for drilling blastholes. Sometimes, compressed-air jack hammer drills are also used for drilling blastholes for secondary blasting of boulders and also for toe drilling in irregular bauxite faces caused 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 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 and instead has adopted the state-of-the-art ripper dozer which is regarded as "Miner's Plough". The ripper dozer silently ploughs the mine surface to extract the mineral. It eliminates 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.

BAUXITE

In Odisha, NALCO has adopted the mechanised 'Trench method' of opencast mining at Panchpatmali mine. In this method, a pilot trench is driven through the middle of the deposit and several other trenches are opened on both sides in a staggered pattern exposing and creating more number of working faces. Transportation of ore to alumina refinery at Damanjodi has been done through a 14.6 km long single-flight, multi curve cable belt conveyor of 1800 TPH capacity. The mining operations involve dozing aside the top fertile soil which usually is preserved 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 has achieved overall capacity of 6.825 million tonnes per year bauxite after expansion from 6.3 million tonnes. Accordingly, higher capacity mobile equipment like dumpers, wheel loaders, ripper dozers and faster drills have been introduced.

CONSUMPTION

In 2016-17, the consumption of bauxite was estimated as 20.84 million tonnes as compared to 19.62 million tonnes in the previous year. Alumina/Aluminium Industry was the principal consumer of bauxite and accounted for 91% consumption in 2016-17 followed by Cement (7%) and Calcination (1%) (Table-7).

Gujarat was the main supplier of abrasive and refractory grade bauxite. Besides, Madhya Pradesh also produces refractory grade bauxite. Alumina plants draw supplies mostly from their captive mines. Hindalco sources bauxite from other suppliers too (Table- 8).

USES & SPECIFICATIONS

Bauxite is primarily used to produce alumina through the Bayer process. Aluminium industry normally uses bauxite containing minimum 40% Al_2O_3 . 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 2008 & 2014) specifications for metallurgical grade bauxite are listed in Table-9. Details of the industries are provided in a separate Review named 'Aluminium and Alumina'.

Table-7: Consumption* of Bauxite 2014-15 to 2016-17 (By Industries)

| (In tonnes) | | | |
|--|-----------------|-----------------|-----------------|
| Industry | 2014-15 | 2015-16 (R) | 2016-17 (P) |
| All Industries | 13572400 | 19622500 | 20846700 |
| Abrasives | 71800 | 92700 | 71400 |
| Alumina | 12017500 | 17438200 | 18892600 |
| Calcination | 140500 | 374600 | 282800 |
| Cement | 1039400 | 1405800 | 1470800 |
| Ferro-alloys | 8000 | 15100 | 17800 |
| Refractory ^{1/} | 286500 | 287900 | 110600 |
| Others (ceramic, chemical, iron & steel, etc) | 8700 | 8200 | 700 |

Figures rounded off.

** Includes actual reported consumption and/or estimates made wherever required and paucity of data, hence coverage may not be complete.*

^{1/} Includes consumption of calcined bauxite. Whereas the apparent consumption of Bauxite was 24403691 tonnes for the year 2016-17.

Table – 8 : Domestic Sources of Supplies of Bauxite to Alumina Plants

| Producer | Plant | Source of supply |
|---------------------|--|---|
| NALCO | Damanjodi, Koraput (Odisha) | Captive mines at Panchpatmali Hills, Koraput distt. Odisha. |
| BALCO | Korba (Chhattisgarh) | Captive mines in Surguja & Bodai-Daldali in Kabirdham (Kawardha) distt. Chhattisgarh. |
| Hindalco Industries | Renukoot (Uttar Pradesh) | Captive mines in Shahdol distt. Madhya Pradesh; Gumla & Lohardaga distts. Jharkhand and Surguja distt. in Chhattisgarh. Also other suppliers include suppliers from Odisha, Madhya Pradesh and Jharkhand; Katni Bauxite Pvt. Ltd, Satna, Laxmidasji Ramji, Katni; and Minerals & Minerals Corp., Gujarat. |
| | Belagavi (Karnataka), Muri, Ranchi (Jharkhand) | Captive mines in Chandgad & Durgmanwadi, Kolhapur distt. Maharashtra and Lohardaga distt. Jharkhand. Udgeri, Gudeghar, Kolhapur distt. Bhoomi Resources Pvt Ltd Maharashtra. |
| Utkal Alumina | Odisha | Baphlimali bauxite mine (Odisha) |
| Vedanta Aluminium | Lanjigarh (Odisha) | GMDC, Gujarat, Ashapura Minechem, Maharashtra, BALCO, Bagmar Resources Pvt Ltd, Chhattisgarh; LDR, M.P. |

BAUXITE

Table – 9 : Specifications for Metallurgical Grade Bauxite (IS : 5953-1985; Reaffirmed 2008 & 2014)

(In % by weight)

| Constituent | Gr. I (essentially gibbsite or trihydrate) | Gr. II * (mixture of gibbsite, boehmite and diaspor or trihydrate & monohydrate) |
|--|--|---|
| Total Al ₂ O ₃ (min.) | 40.00 | 47.00 |
| Total available alumina (min.) | 36.00 | 43.00 |
| Total SiO ₂ (max.) | 4.00 | 4.00 |
| Module Al ₂ O ₃ /SiO ₂ (min.) | 12.00 | 12.00 |
| Fe ₂ O ₃ /TiO ₂ (max.) | 30.00 | 30.00 |
| P ₂ O ₅ (max.) | 0.20 | 0.20 |
| V ₂ O ₅ (max.) | 0.20 | 0.20 |
| Loss on ignition at 1100° C | 20.00 | 20.00 |

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

In Steel Industry, bauxite is used as a slag corrector in place of fluorite and generally bauxite, containing 45 to 54% Al₂O₃ and 5% SiO₂ (max.) is consumed. Size preference is 25 to 125 mm with a tolerance of 5% (max.) for -25 mm & +100mm fractions.

BIS has prescribed the following specifications of bauxite for Refractory Industry (Table-10).

Table – 10 : IS Specifications of Bauxite for Refractory Industry (IS : 10817-1984; Reaffirmed 2008 & 2014)

| Constituent | Percent |
|--------------------------------|------------|
| Al ₂ O ₃ | 58 min. |
| Fe ₂ O ₃ | 3 max. |
| TiO ₂ | 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 ₂ O ₃ | 55-60 |
| Fe ₂ O ₃ | 4-6 |
| TiO ₂ | 5-8 |
| SiO ₂ | 2 |
| Others | 25-40 |
| PCE | 33-36 (Ortan) |

The IS specifications of bauxite for consumption in Chemical and Petroleum industries are given in Table-11.

Table – 11 : IS Specifications of Bauxite for Chemical and Petroleum Industries (IS : 3605-1984; Reaffirmed 2010)

| Constituent | Requirement |
|--|-------------|
| Alumina (as Al ₂ O ₃), % by mass (min.) | 58.0 |
| Silica (as SiO ₂), % by mass (max.) | 3.0 |
| Iron oxide (as Fe ₂ O ₃), % by mass (max.) | 2.0 |
| Titania (as TiO ₂), % by mass (max.) | 4.0 |
| Phosphorus pentoxide (as P ₂ O ₅), % by mass (max.) | 0.3 |
| Manganese dioxide (as MnO ₂), % 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% maximum; that passing through 300-micron IS sieve shall be 1% by mass maximum; and that passing through 212- micron IS sieve but retained on 300-micron IS sieve should be 10% maximum.

The other specifications laid down by BIS are IS:8228-1976 (Reaffirmed 2008) for bauxite sand and IS:8988-1978 (Reaffirmed 2008) for bauxite powder for foundry washes.

SUBSTITUTION

There is no substitute for bauxite as source for aluminium metal extraction carried out on a large scale. However, calcined clay can be substituted for refractory bauxite but only with reduction in time and stock resistance. Sillimanite, alumina, silicon carbide, magnesite-chromite and carbon-magnesite refractories are the other alternatives for high-alumina material but these would entail higher cost. Silicon carbide and diamonds can substitute for fused aluminium oxide in abrasive use but these would entail again at higher cost. Synthetic mullite is a probable substitute for bauxite-based refractories. Silicon carbide and alumina-zirconia are costlier substitutes for bauxite-based abrasives. The raw material like alunite, anorthosite, coal wastes and oil shales are other potential sources of alumina. The extraction, however, would require new plants with different technology. These non-bauxitic materials could satisfy the demand for primary metal, refractories, aluminium chemicals and abrasives.

TRADE POLICY

As per the Foreign Trade Policy 2015-2020 and policy on export and import, imports of aluminium ores and concentrates including natural bauxite, calcined and activated bauxite and others are permitted free. There are no policy restrictions on the export of bauxite.

WORLD REVIEW

The world bauxite reserves are estimated at 30 billion tonnes and are located mainly in Guinea (25%), Australia (20%), Vietnam (12%), Brazil (9%), Jamaica (7%), Indonesia & Guyana (3% each) and China (3%). Countrywise reserves of bauxite are furnished in Table- 12.

The world production of bauxite was estimated at 294 million tonnes in 2015. Australia continued to be the major producer and accounted for about 28% share in total production, followed by China (22%), Brazil (13%), India (10%) and Guinea (6%) (Table-13).

**Table – 12 : World Reserves of Bauxite
(By Principal Countries)**

| (In '000 tonnes) | |
|-------------------------------|-----------------|
| Country | Reserves |
| World: Total (rounded) | 30000000 |
| Australia | 6000000 |
| Brazil | 2600000 |
| China | 1000000 |
| Greece | 250000 |
| Guinea | 7400000 |
| Guyana | 850000 |
| India* | 830000 |
| Indonesia | 1000000 |
| Jamaica | 2000000 |
| Kazakhstan | 160000 |
| Malaysia | 110000 |
| Russia | 500000 |
| Saudi Arabia | 210000 |
| USA | 20000 |
| Vietnam | 3700000 |
| Other countries | 3200000 |

Source: Mineral Commodity Summaries, 2018.

* India's total resources of bauxite as per UNFC system are placed at 3.89 billion tonnes as on 1.4.2015.

Australia

Bauxite production at 2.28 million tonnes increased by about 3% and alumina production decreased slightly to 3,78,000 tpy from that in 2014. Rio Tinto expanded bauxite capacity of the Gove mine in the Northern Territory to 8 million tpy from 6 million tpy, and production increased by 15% to 9,69,000 tpy as compared to the production in 2014. Bauxite production from the Weipa mine increased by 5% to 1.4 million tonnes from that in 2014. Australian Bauxite Ltd. completed construction of the Bald Hill mine in Tasmania and started bauxite production in December. The mine is expected to ramp up to 1.5 million tpy by mid-2017. Rio Tinto has plans to construct a 22.8 million tonnes bauxite mine in Queensland. Bauxite produced at the Amrun mine would be shipped through the port of Cape York. The project is scheduled for completion in 2019.

China

Bauxite production was estimated to be 65 million tpy, 10% more than the revised amount in 2014. Bauxite imports were 55.9 million tpy, 54% more than the 36.3 million tpy imported in 2014. The leading sources of bauxite imports, in descending order, were Malaysia (43%), Australia (35%) and India (14%). Results of exploration projects completed in 2014 were announced, including the discovery of 210 million tonnes of bauxite reserves. Two of the deposits discovered were in Guizhou Province. The Hongguangbe deposit contained 21 million tonnes, and the Dazhuyuan deposit contained 33 million tonnes.

Guizhou Province

Chinalco, Aluminium Corp. of China, which completed the 1.2 million tpy Maochang mine at the year end of 2015 has plans to commence production in early 2016 to supply feed to Qingzhen refinery. China Power Investment Corp. continued construction of an 8,00,000 tpy alumina refinery in Wuchuan County. The refinery would be supplied with bauxite from 1 million tpy Dazhuyuan mine and 1 million tpy Wachangping mine, which were completed during the year.

Guinea

United Company RUSAL Plc continued construction of the Dian-Dian mine, which would have a capacity of 3 million tpy. The bauxite mine was scheduled for completion in 2016 for bauxite to be shipped by rail to a port for export. Hongqiao Group Ltd completed its 5 million tpy bauxite mine in the Boke region and began shipments to its refinery in China in September.

BAUXITE

Indonesia

Bauxite production in Indonesia fell to 2,02,000 tonnes in 2015 as compared to 2.56 million tonnes in 2014 and 57 million tonnes in 2013, as mines that had exported bauxite closed after a ban on exporting bauxite and other unprocessed mineral ores took effect on January 12, 2014. The export ban was part of the 2009 mining law and was intended to increase economic development in the country through investment in mineral processing facilities. Tayan refinery of PT Indonesia Chemical Alumina, is on trial runs of 3 lakh tpa and it will draw bauxite from nearby deposits from West Kalimantan.

Malaysia

Bauxite production in Malaysia increased to 35 million tonnes in 2015 from 3.67 million tonnes in 2014 as mines increased production to supply bauxite feeds to alumina refineries in China. The surge in demand from China was due to the export ban on unprocessed mineral ores, including bauxite that got implemented in Indonesia in 2014.

Russia

Production started at the Cheryomukhovskaya-Glubokaya section of the North Urals mine. Further expansion that was scheduled for completion in 2016, and a third expansion proposed for completion in 2017, would increase the capacity of the mine to 4.6 million tonnes per year from the current 3.4 million tonnes per year.

FOREIGN TRADE

Exports

During 2016-17, exports of bauxite was 2,502 thousand tonnes. Exports of bauxite increased drastically to 8,914 thousand tonnes in 2015-16 from 6,808 thousand tonnes in 2014-15. Exports were mainly to China (96%), UAE (2%) and Kuwait (1%) (Tables-14 to 17).

Imports

During 2016-17, imports of bauxite was 1,715 thousand tonnes. In 2015-16, imports of bauxite decreased to 1,116 thousand tonnes from 1,800 thousand tonnes in the previous year. Imports were mostly from Guinea (55%), Brazil (24%), Pakistan (11%) and China (6%) (Tables - 18 to 21).

**Table – 13 : World Production of Bauxite
2013 to 2015
(By Principal Countries)**

| Country | 2013 | 2014 | 2015 |
|------------------------|---------------|-------------------|--------------------|
| (In '000 tonnes) | | | |
| World: Total | 299295 | 260051 | 294076 |
| Australia | 81119 | 78632 | 80910 |
| Brazil | 33904 | 36313 | 37064 |
| China | 50339 | 59212 | 65000 ^e |
| Greece | 1844 | 1876 | 1821 |
| Guinea | 18763 | 19182 | 18114 |
| Guyana | 1713 | 1564 | 1527 |
| India* | 22319 | 22494 | 28134 |
| Indonesia ^e | 57024 | 2556 | 472 |
| Jamaica | 9435 | 9677 | 9629 |
| Kazakhstan | 5193 | 4516 | 4683 |
| Malaysia | 209 | 3500 ^e | 27700 ^e |
| Russia | 5322 | 5589 | 5398 |
| Saudi Arabia | 1044 | 2076 | 2174 |
| Suriname | 2671 | 2708 | 1865 |
| Venezuela | 2346 | 2316 | 992 |
| Other countries | 6050 | 7840 | 8593 |

Source: World Mineral Production, 2011-2015.

* India's production of bauxite during 2013-14, 2014-15, 2015-16 and 2016-17 was 22,319 thousand tonnes, 22,494 thousand tonnes, 28,134 thousand tonnes and 24,664 thousand tonnes, respectively.

BAUXITE

**Table – 14 : Exports of Bauxite
(By Countries)**

| Country | 2016-17 (P) | |
|----------------------|----------------|------------------|
| | Qty (t) | Value (₹'000) |
| All Countries | 2502385 | 4624604 |
| China | 2067584 | 3497846 |
| UAE | 11000 | 17728 |
| Kuwait | 307610 | 534462 |
| Sri Lanka | 25 | 360 |
| Slovenia | 5779 | 74444 |
| Qatar | - | - |
| Nepal | 41479 | 98541 |
| Estonia | 30800 | 54828 |
| UK | 1103 | 23899 |
| Saudi Arabia | 2500 | 23052 |
| Other countries | 34504 | 299444 |

**Table – 15 : Exports of Bauxite
(By Countries)**

| Country | 2014-15 | | 2015-16 (P) | |
|----------------------|----------------|------------------|----------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 6808588 | 14050662 | 8914624 | 19527405 |
| China | 6239885 | 12547289 | 8528536 | 18613085 |
| UAE | 57200 | 52292 | 165000 | 284505 |
| Kuwait | 120200 | 231441 | 104422 | 200228 |
| Sri Lanka | 10 | 222 | 30275 | 76616 |
| Slovenia | 16499 | 220712 | 5759 | 74965 |
| Qatar | 253304 | 444579 | 30020 | 57368 |
| Nepal | 17177 | 34703 | 25526 | 52759 |
| Estonia | - | - | 16400 | 36759 |
| UK | 2235 | 43992 | 1326 | 28071 |
| Saudi Arabia | 3166 | 32183 | 2061 | 19756 |
| Other countries | 98912 | 443249 | 5299 | 83293 |

**Table – 16 : Exports of Bauxite : Other
Aluminium Ores & Concentrates
(By Countries)**

| Country | 2014-15 | | 2015-16 (P) | |
|----------------------|--------------|------------------|---------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 55970 | 115793 | 158494 | 390432 |
| China | - | - | 127049 | 325300 |
| Qatar | 54253 | 97538 | 30020 | 57368 |
| Thailand | 275 | 5573 | 150 | 3177 |
| Nepal | 895 | 1930 | 1107 | 1706 |
| Saudi Arabia | 66 | 1539 | 61 | 1598 |
| Bangladesh | 108 | 919 | 54 | 455 |
| Kuwait | - | - | 22 | 323 |
| Ethiopia | - | - | 22 | 283 |
| Vietnam | - | - | 9 | 221 |
| USA | 373 | 8294 | - | - |
| Other countries | - | - | ++ | 1 |

**Table – 17 : Exports of Bauxite :
Aluminium Ores & Concentrates
(By Countries)**

| Country | 2014-15 | | 2015-16 (P) | |
|----------------------|----------------|------------------|----------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 6752618 | 13934869 | 8756130 | 19136973 |
| China | 6239885 | 12547289 | 8401487 | 18287785 |
| UAE | 57200 | 52292 | 165000 | 284505 |
| Kuwait | 120200 | 231441 | 104400 | 199905 |
| Sri Lanka | 10 | 222 | 30275 | 76616 |
| Slovenia | 16499 | 220712 | 5759 | 74965 |
| Nepal | 16282 | 32773 | 24419 | 51053 |
| Estonia | - | - | 16400 | 36759 |
| UK | 2235 | 43992 | 1326 | 28071 |
| Saudi Arabia | 3100 | 30644 | 2000 | 18158 |
| Japan | 1004 | 25688 | 500 | 13093 |
| Other countries | 296203 | 749816 | 4564 | 66063 |

BAUXITE

**Table – 18 : Imports of Bauxite
(By Countries)**

| Country | 2016-17 (P) | |
|----------------------|----------------|------------------|
| | Qty (t) | Value (₹'000) |
| All Countries | 1715661 | 6680485 |
| Guinea | 1370529 | 4120719 |
| China | 98188 | 1672656 |
| Brazil | 201956 | 796871 |
| Estonia | 19655 | 34950 |
| Taiwan | 24459 | 41931 |
| Pakistan | 594 | 4131 |
| Netherlands | 177 | 7311 |
| Madagascar | - | - |
| Germany | ++ | - |
| Other countries | 102 | 1916 |

**Table – 19 : Imports of Bauxite
(By Countries)**

| Country | 2014-15 | | 2015-16 (P) | |
|----------------------|----------------|------------------|----------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 1800689 | 8560886 | 1116010 | 5982901 |
| Guinea | 1394291 | 5579257 | 613570 | 2431430 |
| China | 67151 | 1540078 | 68814 | 1408488 |
| Brazil | 99321 | 466413 | 263534 | 1178393 |
| Pakistan | 72912 | 400092 | 124187 | 808714 |
| Malaysia | 37282 | 114235 | 45594 | 142614 |
| Netherlands | 225 | 9911 | 310 | 13121 |
| Madagascar | - | - | 1 | 79 |
| USA | 5 | 324 | ++ | 48 |
| Denmark | - | - | ++ | 7 |
| Singapore | - | - | + | 7 |
| Other countries | 129502 | 450576 | - | - |

**Table – 20 : Imports of Bauxite : Other
Aluminium Ores & Concentrates
(By Countries)**

| Country | 2014-15 | | 2015-16 (P) | |
|----------------------|--------------|------------------|---------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 72313 | 396420 | 124164 | 837477 |
| Pakistan | 72312 | 396357 | 123612 | 804820 |
| Brazil | - | - | 351 | 21135 |
| Chinese | - | - | 201 | 11522 |
| Taiwan | 1 | 63 | - | - |
| Other countries | - | - | - | - |

**Table – 21 : Imports of Bauxite :
Aluminium & Concentrates
(By Countries)**

| Country | 2014-15 | | 2015-16 (P) | |
|----------------------|----------------|------------------|---------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 1728376 | 8164466 | 991846 | 5145424 |
| Guinea | 1394291 | 5579257 | 613570 | 2431430 |
| China | 67151 | 1540078 | 68613 | 1396966 |
| Brazil | 99321 | 466413 | 263183 | 1157258 |
| Malaysia | 37282 | 114235 | 45594 | 142614 |
| Netherlands | 225 | 9911 | 310 | 13121 |
| Pakistan | 600 | 3736 | 575 | 3894 |
| Madagascar | - | - | 1 | 79 |
| USA | 5 | 324 | ++ | 48 |
| Denmark | - | - | ++ | 7 |
| Singapore | - | - | ++ | 7 |
| Other countries | 129501 | 450512 | - | - |

BAUXITE

FUTURE OUTLOOK

The total resources of bauxite that comprise of various grades, as found to occur in the country as on 1.4.2015, is estimated as 3,896 million tonnes. The resources of Metallurgical grade bauxite are adequate while those of the Chemical and Refractory grade bauxite are relatively limited considering the future requirements. As per

provision made in Mineral (Auction) Rule 2015, one bauxite block was auctioned in 2017 in the State of Maharashtra.

As per the Report of the Working Group for the 12th Five Year Plan, the abundance of bauxite resources in Eastern Ghat regions of Odisha and Andhra Pradesh is likely to metamorphose the region into a hub for bauxite mining activities in future.