BAUXITE

DISTRIBUTION IN INDIA

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What is bauxite?

- India is rich in bauxite reserves. A large number of indigenous and tribal people live near the mines, which shows the quantity of bauxite in India. Bauxite is used as a primary ingredient in making aluminium. It consists of 80% of bauxite.
- The raw material of aluminium is known as bauxite ore. It is generally found in the region close to laterite rocks. Laterite rocks are commonly found in the peninsular and coastal regions. That is plateaus and hill ranges.

INTRODUCTION

- **Bauxite is an important ore that is used for making aluminium.** It is an **oxide of aluminium**. It is not a specific mineral but a **rock consisting mainly of hydrated aluminium oxides.**
- The **deposits of Bauxite are mainly associated with laterites** and **occur as capping on hills and plateaus**, except in coastal areas of Gujarat and Goa.
- **Production of Aluminum from Bauxite:** This industry is divided into 2 segments. The **plants for obtaining alumina from bauxite ore, such plants are located near bauxite mines** and **plants for reduction of Alumina into Aluminum, such plants are located near the cheap source of electricity.**
  - **For producing 1 ton of aluminum, 6 tons of bauxite is required (which produces 2 tons of alumina).**

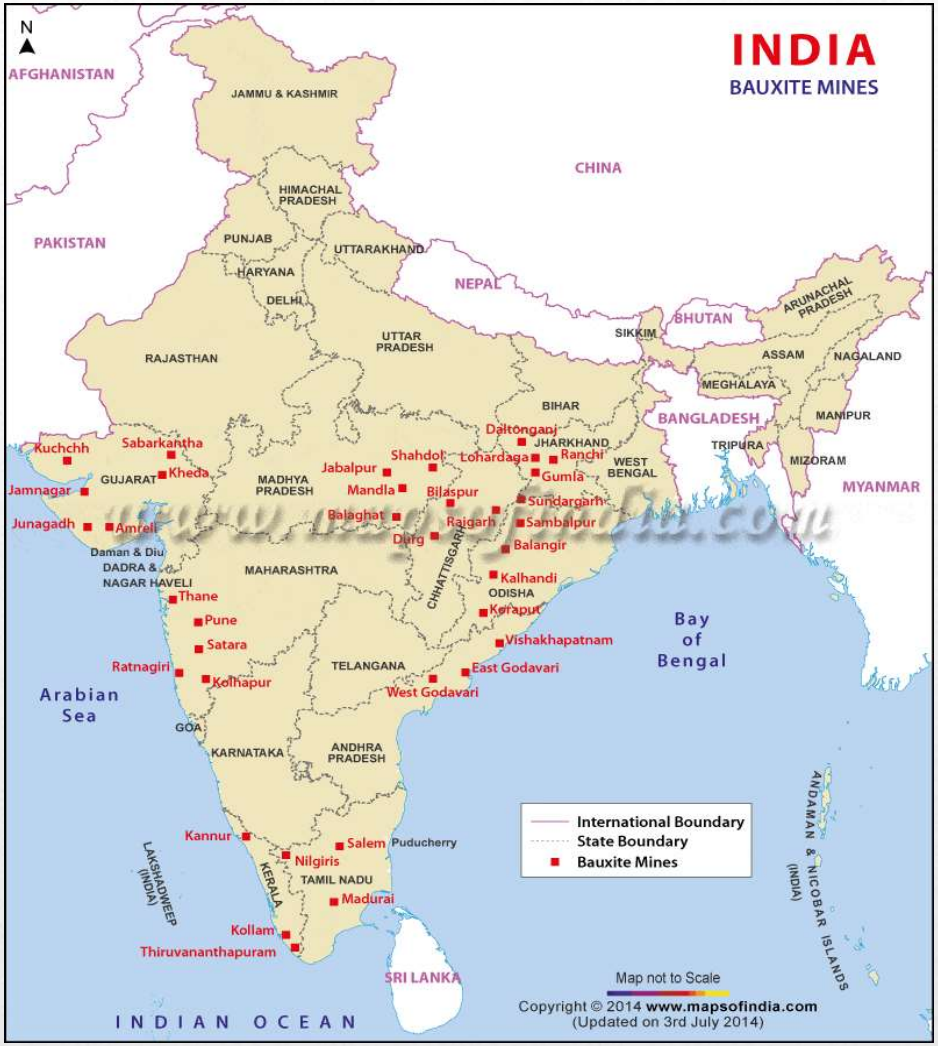
PROCESSING OF BAUXITE

- In this process, aluminium ore is treated with concentrated sodium hydroxide. Soluble sodium aluminate is formed which is filtered off. The filtrate on heating with water gives aluminium hydroxide which gives alumina on strong heating.

BAUXITE

- 80 % of bauxite [ore of aluminium] ore is used for making **aluminium**.
- Found mainly as hydrated aluminium oxides.
- Total resources == 3,480 million tonnes == 84 per cent resource are of metallurgical grade

Bauxite Distribution in India



BAUXITE IN INDIA

- **Odisha** alone accounts for 52 per cent
- Andhra Pradesh 18 per cent
- Gujarat 7 per cent
- Chhattisgarh and Maharashtra 5 per cent each
- Madhya Pradesh and Jharkhand 4 per cent.
- Major bauxite resources are in the east coast in Odisha and Andhra Pradesh.
- India manages to export small quantities of bauxite.
- Major importers are Italy (60%), U.K. (25%), Germany (9%) and Japan (4%).

Odisha

- Largest bauxite producing state.
- One-third of the total production of India.
- Kalahandi and Koraput districts.
- Extends further into Andhra Pradesh
- The main deposits occur in Kalahandi, Koraput, Sundargarh, Bolangir and Sambalpur districts.

Chhattisgarh

- Second largest producer.
- Maikala range in Bilaspur, Durg districts and the Amarkantak plateau regions of Surguja, Raigarh and Bilaspur are some of the areas having rich deposits of bauxite.

Maharashtra

- Third largest producer.
- Largest deposits occur in Kolhapur district.
- Kolhapur district contain rich deposits with alumina content 52 to 89 per cent.
- Other districts: Thane, Ratnagiri, Satara and Pune.

Jharkhand

- Ranchi, Lohardaga, Palamu and Gumla districts.
- High grade ore occurs in Lohardaga.

Gujarat

- Jamnagar, Junagadh, Kheda, Kachchh, Sabarkantha, Amreli and Bhavnagar.
- The most important deposits occur in a belt lying between the Gulf of Kachchh and the Arabian sea through Bhavnagar, Junagadh and Amreli districts.
- Amarkantak plateau area, the Maikala range in Shandol, Mandla and Balaghat districts and the Kotni area of Jabalpur district are the main producers.

Other areas of bauxite production

- **Maharashtra:** The largest deposits occur in the **Kolhapur district** capping the plateau basalts.
- **Chhattisgarh:** The **Maikala range** in Bilaspur, Durg districts, and the Amarkantak plateau regions of Surguja, Raigarh, and Bilaspur are some of the areas having rich deposits of bauxite.
- **Tamil Nadu: Nilgiri and Salem** are the main bauxite producing districts enabling Tamil Nadu to contribute slightly more than 2 percent of India's bauxite.
- **Madhya Pradesh: Amarkantak plateau** area, the **Maikala range** in Shahdol, Mandla, and Balaghat districts, and the Kotni area of Jabalpur district are the main producers.
- Some bauxite is also found in **Andhra Pradesh**, (Vishakhapatnam, East Godavari, and West Godavari), **Kerala** (Kannur, Kollam, and Thiruvananthapuram), **Rajasthan** (Kota), **Uttar Pradesh** (Banda, Lalitpur, and Varanasi), **Jammu and Kashmir** (Jammu, Poonch, Udhampur) **and Goa.**

EXPORT OF BAUXITE

- As much as **80 percent of the bauxite is used for producing aluminium**.
- India's exports of bauxite have been reduced considerably due to increasing demand in the home market. Still, India manages to export small quantities of bauxite. The main buyers of Indian bauxite are **Italy (60%), U.K. (25%), Germany (9%), and Japan (4%).**

National Aluminium Company Ltd. (Nalco) Aluminium Plants

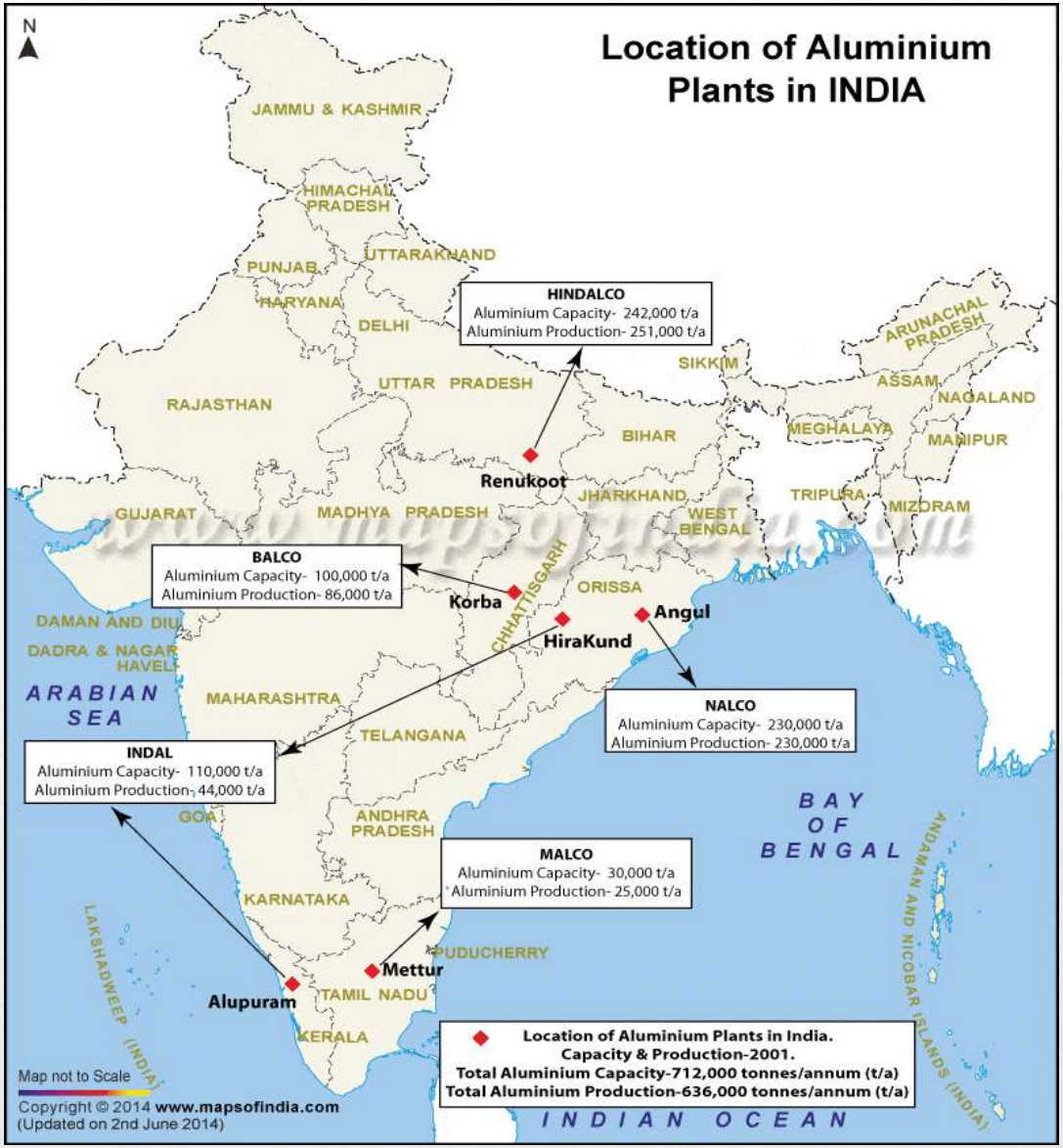
- **Angul**
- The **Angul plant of National Aluminium Company Ltd. (Nalco) is located in the state of Orissa.**
- Bharat Aluminium Company Ltd. (Balco) Aluminium Plants
- **Korba**
- The **Korba plant of Bharat Aluminium Company Ltd. (Balco)** is set to be the largest aluminium plant in the world with a capacity of 1 million tpa from a single location.
- **Located in Chhattisgarh,**
- **Madras Aluminium Company Ltd (Malco) Aluminium Plant**
- **Mettur**
- The **Mettur plant of the Madras Aluminium Company Ltd (Malco) is located at the Mettur Dam complex in the state of Tamil Nadu.**

Aluminium Plants in India

- **Renukoot**
- **Hindalco has its largest aluminium plant located in Renukoot in Uttar Pradesh.**
- **Hirakud**
- **Hirakud plant is located on the bank of Hirakud Dam** (longest earthen dam in the world), 320 km away from **Bhubaneswar in Orissa.**
- Initially established by Indal in 1959, it's the second aluminium smelter in India operating on grid power.
- **Alupuram**
- This smelter of **Hindalco, located in the Ernakulam district of the state of Kerala**, was shut down a long time back. However, the extrusion unit in this plant is still running.
- It's the plant where aluminium ingot was produced for the first time in this country.

LOCATION OF ALUMINIUM PLANTS IN INDIA

Location	Name of company
Korba	Bharat Aluminium Co (BALCO)
Alupuram	Hindustan Aluminium Co. (HINDALCO)
Renukoot	Hindustan Aluminium Co. (HINDALCO)
Mettur	Madras Aluminium (MALCO)
Hirakud	Hindustan Aluminium Co. (HINDALCO)
Angul	National Aluminium Co. (NALCO)
Jharsuguda	Vedanta Aluminium Co. (VAL)


Location of Aluminium Plants in INDIA
N
JAMMU & KASHMIR
HIMACHAL PRADESH
UTTARAKHAND
PUNJAB
HARYANA
DELHI
RAJASTHAN
UTTAR PRADESH
BIHAR
SIKKIM
ARUNACHAL PRADESH
ASSAM
NAGALAND
MEGHALAYA
MANIPUR
TRIPURA
MIZORAM
JHARKHAND
WEST BENGAL
ORISSA
CHHATTISGARH
GUJARAT
MADHYA PRADESH
DAMAN AND DIU
DADRA & NAGAR HAVELI
ARABIAN SEA
MAHARASHTRA
TELANGANA
ANDHRA PRADESH
GOA
KARNATAKA
PUDUCHERRY
TAMIL NADU
KERALA
LAKSHADWEEP (INDIA)
BAY OF BENGAL
ANDAMAN AND NICOBAR ISLANDS (INDIA)
INDIAN OCEAN
HINDALCO
Aluminium Capacity- 242,000 t/a
Aluminium Production- 251,000 t/a
Renukoot
BALCO
Aluminium Capacity- 100,000 t/a
Aluminium Production- 86,000 t/a
Korba
HiraKund
Angul
NALCO
Aluminium Capacity- 230,000 t/a
Aluminium Production- 230,000 t/a
INDAL
Aluminium Capacity- 110,000 t/a
Aluminium Production- 44,000 t/a
MALCO
Aluminium Capacity- 30,000 t/a
Aluminium Production- 25,000 t/a
Mettur
Alupuram
Location of Aluminium Plants in India.
Capacity & Production-2001.
Total Aluminium Capacity-712,000 tonnes/annum (t/a)
Total Aluminium Production-636,000 tonnes/annum (t/a)
Map not to Scale
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(Updated on 2nd June 2014)

USES OF BAUXITE

- **Aluminum production:** The vast majority of bauxite is processed to produce aluminum metal, which is a key component in industries like aircraft manufacturing, machinery, and civil engineering.
- **Chemicals:** Bauxite is used to produce various chemicals, including alum and other aluminum compounds.
- **Refractories:** It is used to make high-alumina refractories, which are essential for lining furnaces in the steel industry.
- **Steel industry:** It acts as a slag corrector and desulfurizing agent, often replacing fluorite.

Other uses of Bauxite

- **Other industries:**
- **Abrasives:** Bauxite is used in the production of abrasives.
- **Cement:** It is a component in cement production.
- **Cosmetics:** It finds use in the cosmetic industry.
- **Construction:** Lateritic bauxite can be used as a building material, and calcined bauxite is used as an anti-skid road aggregate.
- **Paper:** It is used in the papermaking industry.
- **Plastics and rubber:** Bauxite acts as a filler in the plastics and rubber industries.
- **Water purification:** It is utilized in water purification processes.

PROBLEMS OF BAUXITE IN INDIA

- Problems related to bauxite in India include severe environmental degradation from open-pit mining, such as deforestation, biodiversity loss, soil erosion, and water pollution. Social issues include the displacement of local and tribal communities, impacts on their livelihoods and health, and conflicts over land rights. Additionally, the process of refining bauxite into alumina and aluminum creates further pollution, including the generation of red mud waste and air and water pollutants.

Environmental problems

- **Deforestation and habitat loss:**
- Mining operations lead to the clearing of forests, fragmenting habitats and threatening numerous plant and animal species.
- **Water resource disruption:**
- Mining can cause rivers and springs to dry up and lead to water contamination from acid drainage and mine waste.
- **Soil degradation:**
- Mining can cause loss of topsoil, erosion, and the creation of wastelands. This can also lead to issues like landslides and flash floods.
- **Air and water pollution:**
- Dust from mining and transportation causes air pollution, while runoff from ore piles can contaminate surface and groundwater.

Social and Economic problems

- **Displacement of communities:**
- Mining operations often lead to the forced displacement of local and tribal populations from their ancestral lands.
- **Health issues:**
- Local communities face health problems from dust pollution, and there can be broader occupational diseases related to mining.
- **Livelihood impacts:**
- The destruction of fertile land affects the livelihoods of communities that depend on agriculture.
- **Conflict and unrest:**
- There are often conflicts between local communities, mining companies, and government authorities over land acquisition and environmental protection.

Industrial processing problems

- **Pollution from refining:**
- The refining process creates significant pollution, including waste products like "red mud," a highly alkaline byproduct of alumina production.
- **Air pollution from smelters:**
- Aluminium smelters can emit fluoride, sulphur dioxide, and alumina dust, further impacting air quality.