

CHAPTER: 12 INDIA: MINERALS AND ENERGY RESOURCES

GEOGRAPHY



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ANKLESHWAR

CLASS 10th · GSEB

1. Characteristics

- Inorganic & Natural
- Fixed Chemical Composition
- Crystal Structure



2. Formation

- Formed Deep Inside Earth
- Takes Millions of Years



4. Based on Rock Type

1. Igneous Rocks

- Iron, Copper, Gold, Zinc



2. Metamorphic Rocks

- Diamond



What is a Mineral?

Natural Substance from Earth's Interior

3. Types of Minerals

• Solid

- Iron, Gold, Silver



• Liquid

- Mercury, Petroleum



• Gaseous

- Natural Gas



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Types of Minerals

1. Metallic Minerals

2. Non-Metallic Minerals

3. Energy Resources

(a) Precious Metallic Minerals



Gold



Silver



Platinum

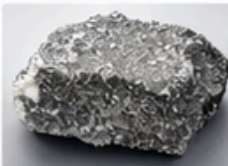


Diamond

(b) Light Metallic Minerals



Bauxite



Magnesium



Titanium



(c) Other Metallic Minerals



Iron



Copper



Manganese



Chromium



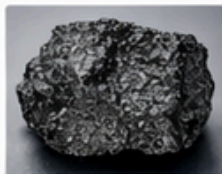
Tungsten



Nickel



Lead



Vanadium

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2. Non-Metallic Minerals

These minerals do not contain metals and are used for daily and industrial purposes.

1.

Limestone



2.

Chalk



3.

Mica



4.

Asbestos



5.

Gypsum



6.

Fluorspar



7.

Sulphur



3. Minerals Used as Energy Resources

These minerals are used to produce energy.

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1.

Coal



Coal

2.

Mineral Oil
(Petroleum)



Mineral Oil
(Petroleum)

3.

Natural Gas



Natural Gas

4.

Uranium



Uranium

5.

Thorium



Thorium

4. Minerals Used for Making Alloys

These minerals are mixed with other metals to make strong alloys.

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1.

Chromium



Chromium

2.

Nickel



Nickel

3.

Tungsten



Tungsten

4.

Vanadium



Vanadium

1. Backbone of Modern Industries



2. Uses of Iron



Machines



Vehicles



Buildings & Bridges



Weapons

3. Properties of Iron

- Cheap & Strong
- Durable
- Easily Alloyed

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IRON ORE



4. Iron Refining



Coke + Lime

Pig Iron

5. Types of Iron Ore in India



Hematite



Magnetite



Limonite



Siderite

6. Major Producers



1. Karnataka
2. Odisha
3. Jharkhand
4. Chhattisgarh
5. Andhra Pradesh



1. Iron & Steel Industry



2. Strong & Flexible Steel

3. Other Uses



Dry Cells



Chemicals



Glass & Tiles



Leather & Matches



Manganese

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4. Major Producers



Odisha



Karnataka



Madhya Pradesh



Goa

1 First Metal Used by Humans



2 Good Conductor of Electricity



3 Uses in Electrical Equipment & Coins



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Copper

4 Bell Metal (Copper + Tin)



5 Brass (Copper + Zinc)



6 Major Producers



- Jharkhand
- Rajasthan
- Madhya Pradesh

1 Main Ore of Aluminium



2 Properties of Aluminium

- ✓ Light
- ✓ Strong
- ✓ Rust-Free &
- ✓ Recyclable



3 Used in Utensils & Electrical Goods



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Bauxite

4 Used in Aircraft & Ships



5 Used in Aircraft & Ships



5 Major Producers



- Odisha
- Chhattisgarh
- Maharashtra
- Jharkhand
- Gujarat

Mica

1.

India is one of the top producers of mica



1 India is one of the top producers of mica.

2.

Fire-resistant and a poor conductor of electricity



2 Fire-resistant and a poor conductor of electricity.

3.

Used in motors, radios, telephones and electrical appliances



3 Used in motors, radios,

3.

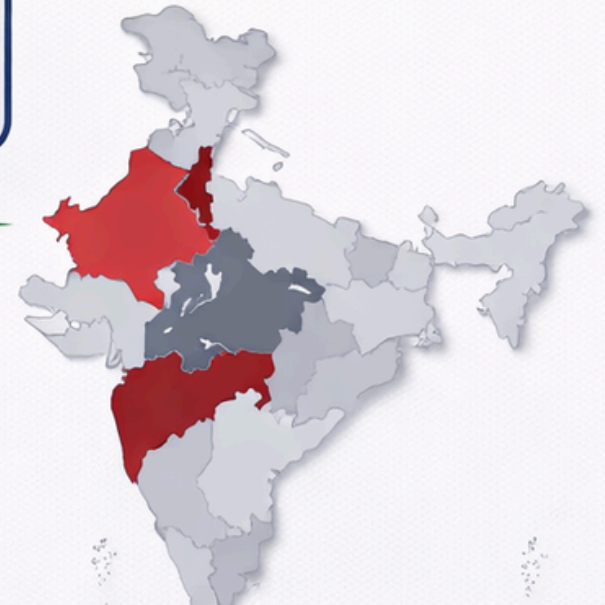
Major producers:

Jharkhand, Bihar,
Andhra Pradesh,
Rajasthan

9

Major producers:

Jharkhand, Bihar,
Andhra Pradesh, Rajasthan



1 Lead Ore — Galena



2 Heavy and Soft Metal



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3 Various Uses



3 Various Uses



4 Major Producers

- Rajasthan
- Andhra Pradesh
- Tamil Nadu



Lead

Uses of Limestone

-  **1** Cement Industry
-  **2** Iron & Steel Making
-  **3** Chemicals & Paper
-  **4** Construction

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Limestone

Main Raw Material for Cement

Major Producers in India

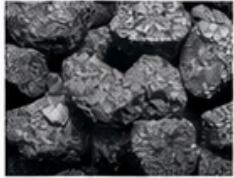
-  **1** Andhra Pradesh
-  **2** Rajasthan
-  **3** Madhya Pradesh
-  **4** Gujarat

Limestone Producing Districts in Gujarat

-  **1** Jamnagar
-  **2** Kachchh
-  **3** Amreli
-  **4** Kheda

Classification of Energy Resources

1. Conventional (Non-Renewable)



Coal



Mineral Oil



Natural Gas



Electricity & Industry

2. Non-Conventional (Renewable)



Solar Energy



Wind Energy



Hydro Power



Tidal Energy



Hydro Power



Biogas



Geothermal



Geothermal

3. Non-Commercial Resources



Firewood



Peat Coal



Dung Cakes

COAL

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1. History & Formation



• Ancient Energy Source



• Formed 25 Crore Years Ago (Carboniferous Period)



• Found in Sedimentary Rocks

2. Types of Coal



Anthracite

Highest Carbon



Bituminous

Most Commonly Used



Lignite

Brown Coal



Peat

Lowest Carbon

3. Coal Production in India

Major States



Jharkhand



Odisha



West Bengal



Chhattisgarh



Madhya Pradesh



Jammu & Kashmir

Other States

• Rajasthan, Tamil Nadu, Assam, Gujarat

Main Uses



• Thermal Power



• By-products: Coal Tar, Benzene, Ammonia, etc.

Lignite in Gujarat

Kachchh, Baruch, Mehsana,
Bhavnagar & Surat



Mineral Oil (Petroleum)

Formation



From Buried
Plants & Animals

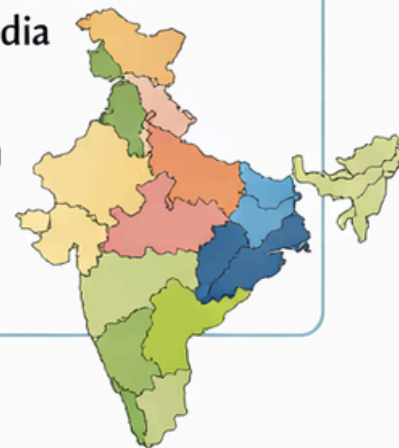


Found in
Sedimentary Rocks



Oil Zones in India

1. North-East India
2. Gujarat
3. Bombay High
4. Eastern Coast
5. Rajasthan



First Oil Well in India
Assam, 1866

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Oil Fields of Gujarat



1st Oil After Independence
Lunej, 1958

- Ankleshwar, Mehsana, Kalol, Navagam, Kosamba, Ahmedabad, Gandhinagar, Vadodara

Oil Refineries in India

Major Refineries

- Guwahati, Barauni, Kochi, Chennai, Mathura, Kolkata, Haldia



Largest Refinery in the World

- Jamnagar, Gujarat



1. Found with Mineral Oil



2. Clean & Non-Polluting



Natural Gas

3. Major Reserves

- Khambhat Basin
- Kaveri Basin
- Jaisalmer Rajasthan



4. Ankleshwar, Gujarat



Large Gas Reserves

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1 Solar Energy



2 Wind Energy



3 Biogas



4 Tidal Energy



5 Geothermal Energy



India: CASE (1981 & GEDA)



1 Solar Cookers



2 Solar Water Heaters



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Solar Energy

3 Solar Panels for Electricity



1 Gujarat

Highest Solar Energy in India

5 Solar Cold Storage



5 Solar Desalination Plant



 **GEDA Initiatives**
Gujarat

• Solar Cold Storage at Chhani (Vadodara)



10-Ton Capacity

• Solar Street Lights in Villages

• Solar Irrigation Pumps



Solar Irrigation Pumps

at Madhopur (Near Bhuj)
Desalination of Seawater



Wind Energy

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1. Caused by Air Pressure Difference from Sun's Heat



2. Windmills for Energy



3. India: 5th in the World



4. Wind Energy Producing States:

-  Gujarat
-  Tamil Nadu
-  Maharashtra
-  Andhra Pradesh
-  Odisha
-  Karnataka
-  Madhya Pradesh
-  Kerala

5. Wind Farms in Gujarat:



► Lambha (Jamnagar)



► Mandavi Coast (Kachchh)



► Devbhumi Dwarka,
Jamnagar, Rajkot, Porbandar

1. Raw Materials



→ Agricultural Waste



→ Molasses (Sugarcane)

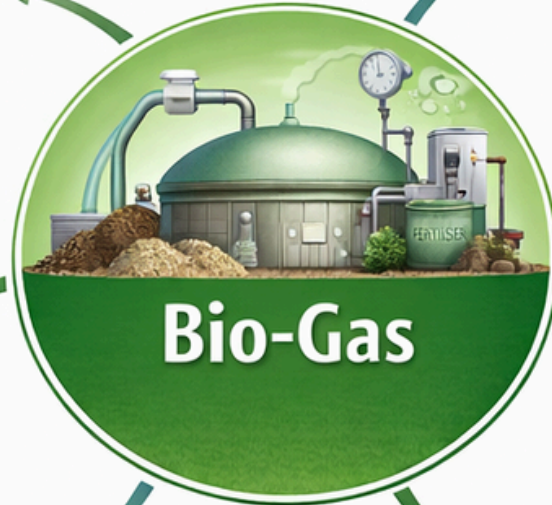
→ Plant Waste

→ Animal & Human Waste



→ Animal & Human Waste

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2. Production Process



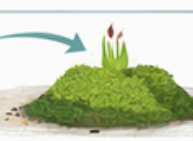
Anaerobic Decomposition

Methane Gas Production

Germ-Free Fertiliser



Anaerobic Decomposition



Germ-Free Fertiliser



3. Benefits



Energy & Fertiliser

Renewable Energy



3. Benefits:

→ Energy & Fertiliser



5. Bio-Gas Plants in Gujarat:



Maithan (Largest Plant) Near Siddhpur

Rudratal (Daskroi, Ahmedabad)



Dantiwada (Banaskantha)

4. Bio-Gas Production in India:

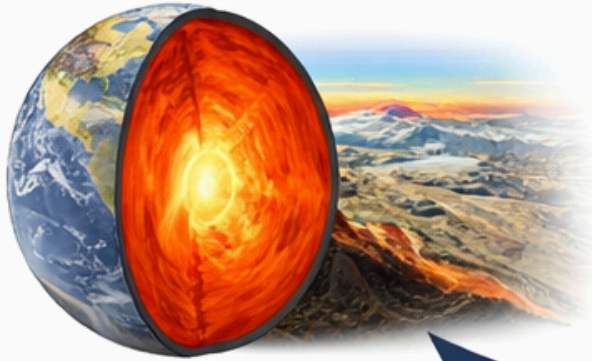


Uttar Pradesh - Ranked **1st**



Gujarat - Ranked **2nd**

1. Heat Inside the Earth



2. Hot Springs & Geysers



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5. Energy Potential



3. Steam Power Generation

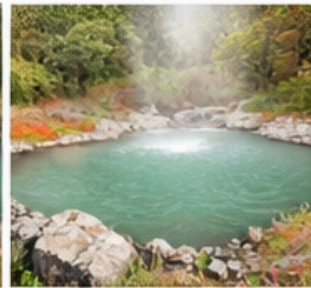


**Geothermal
Energy**

4. Locations in Gujarat



Lasundra



Unai



Tuva



Tulsishyam

1 CAUSE OF TIDES AND EBBS



➤ Tides and ebbs occur in oceans due to the **gravitational pull** of the sun and moon.

2 HOW TIDAL ENERGY IS PRODUCED



➤ The strong **movement of seawater** is used to produce electricity.

3 TURBINES GENERATE POWER



➤ **Turbines are rotated** by tidal water to generate power.

4 HISTORICAL FACT



➤ The first tidal power project was started in **France** in **1910**.

5 INDIA'S POTENTIAL



➤ India has a long coastline, so it has **good potential for tidal energy**.

6 TIDAL ENERGY PROJECTS IN INDIA



GULF OF KACHCHH



GULF OF KHAMBHAT



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1. Essential for Human Life & Economy



2. Limited & Non-renewable



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Mineral Preservation

3. High Export of Minerals



4. Risk of Depletion



5. Use Minerals Efficiently



6. Avoid Wastage



7. Save for Future Generations



7. Save for Future Generations



Remedies for Mineral Preservation

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1. Efficient
Extraction
Technology



4. Promote
Renewable
Energy



2. Recycle
Metals



5. Environmental
Protection



3. Use
Alternative
Materials



6. Planned
Resource
Management