# Leading Producers

1. Iron Ore-Odisha
2. Manganese- Odisha
3. Bauxite-Odisha
4. Copper-Madhya Pradesh
5. Mineral Oil- Maharashtra/Gujarat/Assam
6. Natural Gas-Maharashtra/Assam
7. Solar- Rajasthan (Badla Solar Park, Jodhpur), Karnataka
8. Wind- Tamil Nadu (Muppandal Wind Farm, Kanyakumari, India's largest onshore operational wind farm)
9. Nuclear-Tamil Nadu (Kudankulam, Tirunelveli, largest in India)
10. Biogas- Maharashtra/Gujrat
11. Geothermal-Himachal Pradesh
12. Tidal-Gujrat
13. Rice-West Bengal
14. Wheat-Uttar Pradesh
15. Pulses- Madhya Pradesh/ Rajasthan
16. Soya Bean- Madhya Pradesh
17. Cotton- Gujarat
18. Jute- West Bengal
19. Sugarcane- Uttar Pradesh/ Maharashtra
20. Ground Nut-Gujarat
21. Tea- Assam
22. Coffee – Karnataka
23. Mustard- Rajasthan

On the outline map of India provided:

i. Mark and label 'S' at the location of the Singhbhum iron ore mines.
ii. Print 'C' where coal is mined. -Jharia
iii. Shade and label the city located at the confluence of the Ganga and Yamuna rivers.- Allahabad/Prayagraj
iv. Shade a region with laterite soil in the northeast region.
v. Mark and name the winds that bring cyclone to Vishakhapatnam during December.-NE Monsoon
vi. Mark and name the winds that bring rain to North Western India in Winter.-Western disturbance
vii. Winds that bring rainfall in November-NE Monsoon
viii. Shade and label the mineral rich plateau of India./Ruhr of India.-Chota Nagpur Plateau
ix. Shade and label the important Latitude.-Tropic of Cancer (23 ½ ° )
x. Mark with a dot and name the city which is situated in the Coromandel Coast.-Chennai
xi. Mark and label the range that lies between Narmada and Tapi.-Satpura
xii. Mark and label the leading producing area of iron ore. -Singhbhum
xiii. Shade and label a region with a sparse population in the North of India.-Jammu and Kashmir
xiv. Shade and label a densely populated area in the southern part of India.-Kerala
xv. Shade and label a densely populated area in North India.- Uttar Pradesh/Allahabad
xvi. The state with the highest density of population-Uttar Pradesh
xvii. Shade a state with high density of population south of Tropic of Cancer -Kerala
xviii. Mark with a dot and name the city which lies on the banks of river Jhelum-SriNagar
xix. Mark and name the highest peak of India-K2, Mt. Godwin Austin
xx. Mark and name the highest peak of Himalayas in India.-Kanchenjunga
xxi. Mark and label the important longitude.- Indian Standard Meridian 82 ½ °
xxii. Soil good for cotton-Black Soil
xxiii. Shade and label the Arabian Sea branch of SW Monsoon.
xxiv. Mark and name the winds that bring rainfall to Mawsynram.- SW Bay of Bengal Branch
xxv. Mark and name the winds which bring rain to Mumbai in July.- SW Arabian Sea Branch
xxvi. Mark an area where laterite soil is found below Tropic of Cancer-
xxvii. On shore oil field/oldest on shore oil field-Digboy
xxviii. Mark and name an Offshore Oilfield/largest offshore oil field-Mumbai High
xxix. Name an area where iron ore is mined-Singhbhum
xxx. Mark with a dot and name Singhbhum.
xxxi. Shade and mark the coastal plain that receives rainfall in October-November.- Coromandel
xxxii. Young fold mountains in India-Himalayas (has highest mountain Peak)
xxxiii. Old fold mountains in India-Aravalli Hills (Hills where Mt. Abu located)
xxxiv. Blue mountains-Nilgiri
xxxv. Coast that receives winter rainfall-Coromandel
xxxvi. Largest fresh water lake-Wular Lake (lake fed by R. Jhelum)
xxxvii. The river that flows in the rift valley-Narmada
xxxviii. Ganga of south- Godavari/Kaveri
xxxix. Pass connecting Ladakh with China- Karakoram
xl. Pass connecting Sikkim with China -Nathu La Pass
xli. Riverine Port- Kolkata
xlii. IT capital of India- Bengaluru
xliii. Financial capital of India-Mumbai
xliv. Soil formed by weathering of basaltic rocks- Black Soil
xlv. Dense population north of Tropic of Cancer- Gangetic Plains
xlvi. Sparsely populated in North East India- Arunachal Pradesh

→ largest lagoon on the east coast / largest Salt water lake = Chilika

→ The Capital city of India / city located on the banks of Yamuna – Delhi
→ The commercial capital of India – Mumbai
→ The city with a Riverine Port – Kolkata
→ A city with an artificial Port / Chennai
→ The Port city of ~~Telangana~~ / Kerala / a natural Port in the Malabar Coast – Kochi
→ The city located on the banks of River Jhelum – Srinagar

→ a natural Sea port on the east of India = Vishakapatnam

→ The city located in the confluence of the Rivers Ganga & Yamuna / The city through which the Indian Standard Meridian (82½° E) passes — Prayagraj / Allahabad

→ Sorrow of Odisha — Mahanadi

→ Sorrow of ~~Bihar~~ Bihar — Kosi

→ The River known for floods & gully erosion - Chambal.

→ Sorrow of Bengal - Damodar.

→ The River that runs parallel to the Vindhya mountains to its South / the River that runs through a rift valley - Naemada.

→ The River that flows to the South of the Satpura hills — Tapi

→ Dakshin Ganga - Godavari

→ Ganges of South India — Kaveri

→ Hills known as Sahyadris / ~~has~~ Anaimudis
highest Peak — western Ghats

→ Soil formed by the process of leaching / found on the Summit of the E-Ghats = Laterite Soil

→ Soil formed by weathering of volcanic rocks / found in the western part of Deccan plateau - Black Soil.

# NATURAL VEGETATION

| Type of Forest | Temperature | Rainfall | Distribution | Trees |
|---|---|---|---|---|
| **Tropical evergreen** *(mixed stands-characterised by climbers and epiphytes)* | 25C to 27C | 200cm to 250cm | 1. Western slope of western ghats<br>2. Hills of north-east region (Garo, Khasi, Jayanthia, Lushai) hills<br>3. Islands of Andaman and Nicobar, and Lakshadweep<br>4. Tamil Nadu coast | Rosewood, Ebony, Mahagony, Sisam, Gurjan. |
| **Tropical deciduous** *(Pure stands)* | 25°C to 27°C | 150cm to 200cm | 1. North-eastern part of Peninsular India<br>2. Foot hills of Himalayas<br>3. Eastern slopes of western Ghats | Teak, Sal, Sandalwood, Mahua. |
| **Tropical desert** *(Characterized by Xerophytic plants)* | 25C to 27C | Less than 25cm | 1. South-west Punjab<br>2. Central and eastern Rajasthan<br>3. Parts of Maharashtra, Karnataka and Andhra Pradesh | Neem, Date Palm, Babool, Cactus, Ber |
| **Littoral / Tidal** *(Classified by Pneumatophores)* | 26°C to 29°C | 200cm to 250cm | 1. Found on large deltas on the eastern coast<br>2. Krishna – Godavari – Kaveri Delta<br>3. Sunderbans delta in West Bengal | Sundari, Gorjan, Hintal, Casuarina |
| **Montane / Alpine** *(Mixed deciduous and coniferous forests)* | ~~20°C~~ to ~~15°C~~ 15°C to 20°C | 200cm to 250cm | 1. Himalayan zone from Kashmir to Arunachal Pradesh<br>2. Nilgiris and Annamalai hills in the South | Chirpine, Oak, Silver Fir |

# MINERAL AND ENERGY RESOURCES

| Metallic Mineral | | Characteristics | Distribution | |
|---|---|---|---|---|
| **Iron Ore** | **Magnetite** | 1. Dark brown to black in colour – hence also called black ore.<br>2. Best quality of iron ore – above 70% iron content.<br>3. Possess magnetic properties hence called magnetite. | *Andhra Pradesh, Karnataka, Tamil Nadu* | Distribution of Iron:<br>1. Odisha – largest producer of good quality haematite.<br>a. Mayurbhanj<br>b. Sundargarh<br>2. Karnataka – largest source of magnetite in India.<br>a. Babu Budon Hills<br>b. Chitradurga<br>3. Chhattisgarh –<br>a. Bailodilo<br>b. Dolli |
| | **Haematite** | 1. It is reddish in colour hence called red ore<br>2. It contains 60% to 70% pure iron content | *Odisha, Andhra Pradesh, Karnataka* | |
| | **Limonite** | 1. It is inferior quality ore as it only contains 40% to 60% pure iron content.<br>2. Yellowish to light brown in colour | *Himachal Pradesh, Uttar Pradesh, Uttarakhand* | |
| | **Siderite** | 1. Inferior ore as it contains 10% to 40% iron.<br>2. Contains lots of impurities<br>3. It is self-Fluxing in nature due to the presence of Lime | *Gujarat, Rajasthan, Himachal Pradesh* | |
| | | General uses of Iron: making Pig iron, sponge iron and steel; used to make automobiles, roads, railways, buildings, machines etc. | | |
| **Manganese Ore** | | 1. Used for making steel tough and resistant to rusting, thus important for Iron and Steel Industry<br>2. Used in cell batteries<br>3. Used to manufacture bleaching powder, glass, insecticides, paints and ceramics. | 1. Odisha – Largest Producer of Manganese<br>a. Mayurbhanj<br>b. Sundargarh<br>2. Karnataka – Shivamogga, Chitradurga<br>3. Maharashtra – Nagpur and Ratnagiri | |
| **Copper Ore** | | 1. Good conductor of electricity, malleable, ductile and hence used to make electrical appliances<br>2. Used in automobiles and defence industries<br>3. Resistant to corrosion and alloyed with iron and nickel to get stainless steel, zinc for brass and tin for copper | 1. Madhya Pradesh – Taregaon (Balaghat), Jabalpur<br>2. Rajasthan – Ketri (Singhara belt), Ajmer<br>3. Jharkhand – Santal, Hazaribad | |

<table>
<tr><th colspan="2">Name of Energy Resource</th><th colspan="2">Distribution</th></tr>
<tr><td rowspan="4">Coal<br>Source of power for running machines<br><br>Used for iron and steel manufacturing<br><br>Generating electricity<br><br>By product – coal tar produce phenol, soap dyes etc.<br><br>Cheapest mineral, price is stable</td><td>Anthracite</td><td>1. Best quality of coal, 80% to 90% of carbon<br>2. Hard compact and jet black in colour<br>3. Burns slowly without smoke<br>4. Shiney compressed with no banded structure<br>5. Burns for a long time and leaves very little ash<br>6. High heating and calorific value<br>7. Found in Jammu and Kashmir</td><td rowspan="4">1. Conventional source of energy<br>2. Inflammable organic rock found in sedimentary rocks<br>3. Formed due to accumulation of organic Matter in swampy lowland areas. Mass of vegetative matter under heat and pressure turns into coal<br>4. Coal is the main source of power generation in India.<br>5. Coal is required by Iron and steel industry and chemical industries<br>6. Raniganj is the oldest coal field in India<br>7. Largest coalfield is in Jharia, Jharkhand<br>a. Gondwana coalfield: formed 200million years ago. Bituminous coal found here. 98% India's reserves.<br>i. Jharkhand – Jharia, Bokaro<br>ii. Chhattisgarh – Korba<br>iii. Odisha – Talcher and Sambalpur<br>iv. West Bengal – Raniganj<br>b. Tertiary coalfield – 55million years ago. Comparatively high moisture and associated with sediments.<br>i. Kashmir – Raisi<br>ii. Assam – Lakhimpur<br>iii. Arunachal Pradesh – Namchik</td></tr>
<tr><td>Bituminous</td><td>1. Most widely used variety of coal and has wide utilization in domestic purposes hence called household coal<br>2. Contains 60% to 80% carbon. High calorific value due to low moisture content<br>3. Jharkhand, Odisha and West Bengal</td></tr>
<tr><td>naphthalene<br>Lignite</td><td>1. Known as Brown Coal contains 40% carbon<br>2. Contains more moisture and hence less combustible matter<br>3. Palna (Rajasthan), Neyveli (Tamil Nadu), Lakhimpur (Assam)</td></tr>
<tr><td>Peat</td><td>1. Represents the first stage of transformation to coal<br>2. Has lowest carbon content.</td></tr>
<tr><td colspan="2">Petroleum<br>Used to power locomotives in air, water and land<br><br>Used to make petrol, diesel, kerosene, tar, LPG, paraffin wax<br><br>Used to produce petrochemical products like synthetic rubber, fibre and Poly Vinyl Chloride (PVC)</td><td colspan="2">1. Petroleum = Petra (rock) + oleum (oil), petroleum means rock oil<br>2. Petroleum is also called liquid gold as not even the smallest drop is wasted and it is also very expensive<br>3. Petroleum is usually found in sedimentary rocks sandstone, shale, limestone hence called mineral oil<br>4. Oil was first discovered in Makum, North East Assam<br><table><tr><td>Onshore oilfields<br>Assam – Digboi (oldest), Bappapung, Hamsapung<br>Arunachal Pradesh – Nigreu<br>Gujarat – Kalol, Ankleshwara, Koyali, Kosamba<br>Oil fields in Godavari and Kaveri Basins</td><td>Offshore at Mumbai High, Bassein, Aliabet<br>Mumbai high:<br>1. 176km from north west Mumbai, discovered by ONGC (Oil and Natural Gas Corporation)<br>2. Drilling platform – Sagar Samrat, oil set to Trombay refinery through pipeline<br>3. Produces 1/3 of all crude oil output of India</td></tr></table></td></tr>
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| | | |
|---|---|---|
| **Natural Gas**<br>*Compared to Petroleum, more environmentally friendly.*<br><br>*Renewable resource and can be safely stored. Used for cooking*<br><br>*Cleaner cheaper fuel than diesel etc.* | | 1. Occurs in association with mineral oil<br>2. Primarily consists of methane gas and is created by two ways<br>a. Biogenic Mechanism<br>b. Thermogenic Mechanism<br>3. Gas used for running vehicles is called compressed natural gas (CNG)<br>4. In household purposes it is called Liquified Petroleum Gas (LPG)<br>5. ¾th of the natural gas comes from Mumbai High and rest from Assam, Tamil Nadu and Tripura<br>6. Gas authority of India Ltd. (GAIL) is pioneering Natural Gas Exploration |
| **Hydel Power**<br>*Clean non-polluting source of electricity*<br><br>*Renewable source of energy that doesn't cause global warming*<br><br>*Cheaper than fossil fuels* | **Bakra – Nangal Dam** | 1. Joint venture of Punjab, Haryana and Rajasthan Governments<br>2. Consists of Bhakra and Nangal Dams together known as Bhakra-Nangal Project<br>3. Constructed across the Satluj at the Bhakra Gorge in the Shiwaliks<br>4. Bhakra dam:<br>a. Second largest dam in India<br>b. Reservoir is Govind Sagar, third largest water reservoir (9.3billion cubic metres) in India<br>5. Nangal Dam:<br>a. 13km downstream from Bhakra dam<br>b. Provides water to Bhakra irrigation canal<br>6. Powerhouses of the Bhakra-Nangal dam:<br>a. Bhakra<br>b. Nangal<br>c. Ganguwal<br>d. Kotla<br>7. Bhakra canal system:<br>a. Distributed to Punjab, Haryana and Rajasthan (27.41lakh Hectares)<br>b. Aim – to provide water for irrigation, generate hydroelectricity, prevent flood in Satluj and Beas River. |
| | **Hirakud Dam** | 1. Built across river Mahanadi in Odisha, 15km from Sambalpur<br>2. River originates in the Maikal hills<br>3. World's longest mainstream dam<br>4. Odisha, Chhattisgarh, Madhya Pradesh Benefit from this project<br>5. It is the first major earthen dam and the largest artificial lake in Asia.<br>6. Two powerhouses:<br>a. Hirakud powerhouse<br>b. Chiplima powerhouse<br>7. Helped in the industrial development of Odisha as it is rich in minerals<br>8. It also helps in soil conservation, |

| | | | |
|---|---|---|---|
| **Solar Power** *Sun provides large amounts of energy. Due to India's Proximity to the Tropic of Cancer, it receives 300 clear sunny days'* | **Solar cell (Photovoltaic)** | 1. Photovoltaic technology converts sunlight directly to electricity using specially designed cells arranged in suitable arrays. Used in calculators, electronic watches, street lighting, traffic signals. | |
| | **Solar cooker** | 1. Uses direct solar heat to heat up food.<br>2. It heats food by reflecting the sun's rays by a mirror onto a glass sheet which covers a black insulated box. The raw food is kept inside the box and the heated inside of the box emits IR which cooks the food | |
| | **Solar water heater** | 1. Comprise of specially designed flat plate panels or reflectors to absorb solar energy when sun's rays fall on the panel, they are mounted on rooftops at a suitable angle always facing south. | |
| **Nuclear Energy** *is obtained from energy stored in the nuclei of atoms of radioactive elements* | **BWR** | *Boiling Water Reactor:* Water boils due to heat produced by nuclear reaction and turns into steam which is used to turn turbines | Generation:<br>1. Atoms like Uranium, Thorium react and split apart<br>2. This process of splitting of atoms is called Nuclear Fission<br>3. Nuclear fission creates heat which is used to generate power by spinning turbines<br>Kaiga – Karnataka, Kakrapur – Gujarat, Kalpakkam - TN |
| | **PWR** | *Pressurized water Reactor:* Water is heated by nuclear reaction but doesn't boil and becomes pressurized, this pressurized water is circulated in tubes where they become steam and then turn the turbines | |
| **Gobar Gas:** | | 1. Biogas is composed of methane, carbon dioxide, hydrogen sulphide and produced by the anaerobic degradation. The residue left behind in the tank is nutritious and is used as manure. Gobar gas plants used cow dung.<br>2. They are setup in villages where they provide dual benefits to farmers by, providing manure for fertilizing and providing gas for cooking and pumping wells<br>3. Digester tank is placed underground. A water cow dung mix is received through the inlet pipe and the spent slurry comes through the outlet pipe and the gas is stored in the tank, has an outlet controlled by a pipe and a valve | |
| **Wind Energy** | | 1. Energy obtained by making use of windmills, that rotate due to force of wind which helps drive machines like water pumps, flour grinders and electricity generators<br>2. Number of windmills in a definite pattern is called a wind farm<br>3. Largest windfarm is in Nagarcoil to Madurai in Tamil Nadu. Wind farms are also found in Kerala, Karnataka etc. | |

# INDUSTRIES

| Industries | | Major Factors Contributing to the Presence of Industries | Distribution |
|---|---|---|---|
| **Cotton Textile** | | 1. India is famous for cotton manufacturing. There are two sectors in cotton textile production, hand loom and power loom sectors<br>2. Largest mills are found in Maharashtra, Gujarat and Tamil Nadu | |
| | **Maharashtra** | 1. Most important cotton cloth producing state. Produces 40% of all mill cloth and employs 3lakh people<br>2. Black cotton soil, humid climate, Hydroelectricity from Tata Hydroelectric Power Grid.<br>3. Mumbai is called Cottonopolis and Lancashire of India<br>4. Great transportation through roads, railways and ports (Mumbai Port), cheap and skilled labour from neighbouring states, Mumbai is commercial capital of India and thus has great banking facilities | *Mumbai, Solapur, Nagpur, Aurangabad* |
| | **Gujarat** | 1. Second largest producer of cotton textile in India. 23% mill cloth in India<br>2. Humid climate, availability of black soil, good transport facilities like road ways, railways and ports (Free Trade Zone – Kandla Port)<br>3. Cheap hydroelectric Power from Ukai and from Kakrapur<br>4. Good market for finished products, cheap and skilled labour has many banking facilities | *Vadodara, Surat, Rajkot and Porbandar* |
| | **Tamil Nadu** | Produces only 6% mill cloth however creates one third of all yarn hence called Manchester of South India | *Coimbatore, Madurai, Salem* |
| **Silk** | | 1. Availability of favourable climatic conditions<br>2. Availability of Mulberry plant in plantation form and presence of silkworm Bombyxmori which is reared throughout the year<br>3. Availability of soft water and water free from alkali, salt<br>4. Rearing of silkworm, reeling and weaving is the main occupation of people in Mysuru<br>5. Women usually care for silkworm and men tend to the plantations | 1. India is the largest producer of silk in the world.<br>2. Varieties are – Eri, Muga, Tussar and Mulberry Silks<br>3. Rearing of silkworm for the producing silk is called sericulture<br>4. In India 90% of silk produced is Mulberry silk. Karnataka is the leading producer of Mulberry Silk<br>5. Eri, Muga, Tussar are made in Assam Bihar and Madhya Pradesh |

| Sugar | FACTORS FOR LOCATION OF SUGAR INDUSTRY:<br>1. They are located in the vicinity of a sugar plantation as; transportation costs of sugarcane increases if it is far away since sugarcane is heavy and sugar quantity (sucrose) decreases if it is not crushed within 24 hours<br>2. Sugar industries produce sugar at a 25km radius from field if more than 25km produce jaggary<br>SHIFT OF INDUSTRY FROM NORTH TO SOUTH INDIA:<br>1. Tropical climate of S.I. is suitable for sugarcane as frost is its enemy in N.I. and black soil found in SI is ideal for this crop. Tropical variety has higher sucrose content<br>2. Crushing season is longer in SI (7-8months October to May)<br>3. Mills in south India are more advanced and modernized | 1. Second largest organized industry in India<br>2. Produces – Sugar, Jaggary (Gur), Kandasari<br>3. By Products of the Sugar industry are – Molasses, Bagasse and Press mud<br>4. Molasses – viscous by-product that is dark-brown in colour, resulting from refining beet and sugarcane. Used in fertilizers, DDT and cattle feed<br>5. Bagasse – dry fibrous residue remaining from the extraction of juice from sugarcane, used as raw material for paper industries and making cardboard boxes<br>6. Press mud – residue from filtration of juice, used for making wax and carbon paper. |
|---|---|---|

| Name | Source of Iron Ore | Source of Coal | Source of Water (cooling purposes) | Flux Material *Lime and Dolomite* | Transport | Labour |
|---|---|---|---|---|---|---|
| **TATA Iron and Steel Company** *Singhbhum, Jharkhand* | High Grade Haematite from Naomundi Mine in Singhbhum (Jharkhand) and Mayurbhanj | Jharia coalfield | Sundargarh | Sundargarh and Singhbhum | Good roadway and railway connections with Kolkata, Mumbai, Chennai | Densely populated regions of Odisha and Jharkhand |
| **Rourkela** *Sundargarh, Odisha* | Sundargarh and Keonjhar ***Manganese from Barajanda Jharkhand*** | Jharia, Jharkhand and Korba Chhattisgarh | Brahmani River | Dolomite from Baradwar in Madhya Pradesh | Well connected to Kolkata through rails and roadways | Cheap labour from neighbouring areas- |

| Type | Name | Location |
|---|---|---|
| **Petrochemical Industry** | Union Carbide India Ltd. *First petrochemical complex* | Trombay, Maharashtra |
| | Udex Plant *at Koyali Refinery* | Koyali, Gujarat |
| | Indian Petrochemical Corporation Ltd. | Vadodara, Gujarat |
| | Petrofils Corporative Ltd. | Vadodara Gujarat |
| | *A petrochemical complex* | Bongaigaon, Assam |
| | Haldia Petrochemical and Mitsubishi Chemical Corporation | Haldia, Assam |
| | Patal Ganga *by Reliance Group* | Hazira, Gujarat |
| **Electronics Industry** | Indian Telephone Industry | Bangalore, Karnataka |
| | Electronics Corporation of India Ltd. | Hyderabad, Andhra Pradesh |
| | Bharat Electronics Ltd. | Bengaluru, Karnataka |
| **Space Industry** | National Remote Sensing Agency | Hyderabad, Andhra Pradesh |
| | Satellite Launching Station | Sriharikota, Andhra Pradesh |
| | Indian Space Research Organization | Bengaluru, Karnataka |

Main centres of television and audio system industry (entertainment) is in Mumbai, Kolkata, Chennai, Pune.