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**NCERT CONDENSED / SUMMARISED
CLASS 10**

Chapter 1 Resource and Development

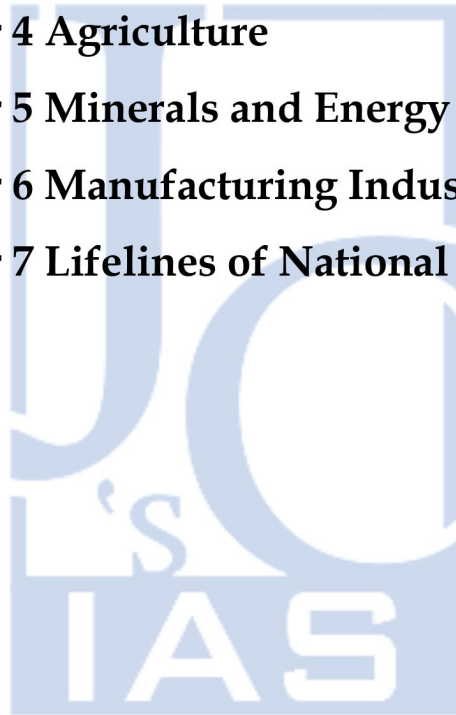
Chapter 3 Water Resources

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Resource and Development -Chapter 1

'Resource':

- Everything available in our environment which can be used to satisfy our needs, is called a resource. It should be technologically accessible, economically feasible and culturally acceptable. Only then, it can be termed as a 'Resource'. Examples: minerals, forests, fossil fuels etc.

Classification of Resources:

- On the basis of origin: Biotic and Abiotic.
- On the basis of exhaustibility: Renewable and Non-renewable.
- On the basis of ownership: Individual (Personal), Community, National and International.
- On the basis of status and development: Potential, Developed, Reserve and Stock.
- Biotic Resources are obtained from the biosphere. They have life or are living resources, e.g., human beings, fisheries, forests, etc.
- Abiotic Resources include all non-living things, e.g., rocks and minerals.

Renewable Resources:

- The resources which can be renewed or reproduced by physical, chemical and mechanical processes are known as renewable or replenishable resources, e.g., water, wildlife, forests, solar energy, wind energy, etc.

Non-renewable Resources:

1. The resources which once get exhausted, cannot be remade. They take a long geological period of time, i.e., millions of years in their formation, e.g., minerals, fossil' fuels, etc.
2. Individual resources: Owned by individuals, e.g., own land, house;
3. Community Owned Resources: Resources which are accessible to all the members of the community, e.g., parks, playground;
4. National Resources: Resources which belong to the nation, e.g., roads, railways; and
5. International resources: Resources which no individual country can utilize, e.g., oceanic waters beyond 200 km.
6. Potential resources: Resources found in a region but not in use, e.g., solar energy in Rajasthan, wind in Gujarat;



7. Stock: Resources available but do not have appropriate technology to access, e.g., lack of technical know how to use hydrogen and oxygen as source of energy; and
8. Reserve: Subset of stock. Can be used for future needs, e.g., water in the dams, forest resources.

Sustainable development:

- Sustainable economic development means that 'development should take place without damaging the environment and development in the present should not compromise with the needs of future generation'.

Land under important relief features in India:

- Plains-43%, Mountains-30%, Plateaus-27%

Land Degradation:

- Continuous use of land over a long period of time without taking appropriate measures to conserve and manage it.

Measures to solve problem of land degradation:

- Afforestation, proper management of grazing to control overgrazing planting of shelter belts of plants, stabilization of sand dunes by growing thorny bushes, control of mining activities, avoid over-irrigation and overuse of fertilizers and pesticides.

Soil erosion:

1. The denudation of the soil cover and subsequent washing down is soil erosion.
2. Reasons for soil erosion include –
3. Human activities like deforestation, over grazing construction, mining defective method of fanning etc.;
4. Natural forces like wind, glacier and water flow.

Types of erosion:

- a) Gully erosion. The running water cuts through the clayey soils and makes deep channels known as gullies. This makes the land bad land and in the
- b) Chambal basin such land is known as ravines;
- c) Sheet erosion. When top soil over large area is washed away it is known as sheet erosion.

Methods to prevent soil erosion in hilly area:

- Ploughing along the contour lines-contour ploughing; terrace cultivation; strip farming and shelter belts.

Soils and its types:

- **Alluvial soils:** Entire northern plains are made of alluvial soil. Also found in the eastern coastal plains particularly in the deltas of the Mahanadi, the Godavari, the Krishna and the



Kaveri rivers. Fertile soil therefore, fit for agriculture purpose. Regions of alluvial soils are intensively cultivated and densely populated. Rich in potash, phosphoric acid and lime which are ideal for the growth of sugarcane, paddy, wheat and other cereal and pulse crops.

- **Black soil:** Black in colour and are also known as regur soils. Ideal for growing cotton and is also known as black cotton soil. Found in the plateaus of Maharashtra, Saurashtra, Malwa, Madhya Pradesh and Chhattisgarh also along the Godavari and the Krishna valleys. Made up of extremely fine, i.e., clayey material. Well-known for their capacity to hold moisture. Rich in calcium carbonate, magnesium, potash and lime.
- **Red and yellow soils:** Found in the areas of low rainfall in the eastern and southern parts of the Deccan plateau. Also found in parts of Odisha, Chhattisgarh, southern parts of the middle Ganga plain and along the piedmont zone of the Western Ghats. Develop a reddish colour due to diffusion of iron in crystalline and metamorphic rocks.
- **Laterite soils:** Develops in areas with high temperature and heavy rainfall. Found in Karnataka, Kerala, Tamil Nadu, Madhya Pradesh, and the hilly areas of Odisha and Assam. Suitable for cultivation with adequate doses of manures and fertilizers. Low Humus content because decomposers, like bacteria, get destroyed due to high temperature.
- **Arid soils:** Found in the western parts of Rajasthan. After proper irrigation these soils become cultivable. Lacks humus and moisture because dry climate, high temperature make evaporation faster. Salt content is very high and common salt is obtained by evaporating the water.
- **Forest soils:** Found in the hilly and mountainous areas where sufficient rain forests are available. Feature differs based on location. Loamy and silty in valley sides and coarse grained in the upper slopes. Sil in the lower parts of the valleys particularly on the river terraces and alluvial fans are fertile.

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Water Resources- Chapter 3

Fresh water:

- 96.5 per cent of the total volume of world's water is estimated to exist as oceans and only 2.5 per cent exists as fresh water. 70 per cent of the fresh water occurs as ice sheets and glaciers in Antarctica, Greenland and the mountainous regions of the world. Less than 30 per cent is stored as groundwater in the world's acquirers.
- Fresh water is mainly obtained from surface run off and ground water. This is continually being renewed and recharged through the hydrological cycle. All the water moves within the hydrological cycle making water a renewable resource.

Three fresh water sources are:

- Precipitation—from rainfall; Surface water—in rivers, lakes, etc.; Ground water—water stored in underground acquirers which gets recharged by rainfall.

Water scarcity:

- Water scarcity means shortage of water. It is usually associated with regions having low rainfall or drought prone areas.

There are many other reasons which lead to scarcity of water:

- Large growing population; In the agricultural sector, water resources are being over-exploited to expand irrigated areas and dry- season agriculture; More water required for irrigation purposes to facilitate higher food production, i. e., for doing multiple cropping and for HYV seeds;
- There is greater demand for water with growing urbanization and industrialization; An unequal access to water among different social groups;
- Quality of water is deteriorating, i.e., getting polluted by domestic and industrial wastes, chemical fertilizers and pesticides used in agriculture; Excessive use of water by industries which also require water to generate hydro-electric power to run them; and Over exploitation of water in the urban areas.

Adverse effects of over-exploitation of ground water resources:

- Pumping out more water from under the ground may lead to falling ground water levels.
- It will adversely affect water availability.



- This, in turn, will affect our agriculture and food security of the people.
- Impoverishment of water resources may adversely affect the ecological cycle.

Main causes of water pollution:

- Domestic wastes, especially urban sewers; industrial wastes are disposed off in the water without proper treatment; chemical effluents from industries and from agricultural sector; and many human activities, e.g., religious rituals and immersing of idols, etc. in the water also pollute water.

Measures for water conservation:

- Do not overdraw the ground water, recharge it by techniques like rainwater harvesting; tapping rainwater in reservoirs, watershed development programmes, etc.
- Avoid wastage of water at all levels and do not pollute the water.
- Adopting water conserving techniques of irrigation, e.g., drip irrigation and sprinklers etc., especially in dry areas.
- A dam is a barrier across flowing water that obstructs, directs or retards the flow, creating a reservoir, lake or impoundment. A dam is the reservoir and not the whole structure.

Multipurpose river valley projects – 'The Temples of Modern India':

- Jawahar Lai Nehru pro-claimed that multipurpose projects are 'The Temples of Modern India', because they were thought of as the vehicle that would lead the nation to development and progress.
- He believed that these projects with their integrated water resource management approach would integrate development of agriculture and the village economy with rapid industrialization and growth of the urban economy.

Advantages:

- They bring water to those areas which suffer from water scarcity and also provide water for irrigation;
- These projects generate electricity for industries and our homes;
- They help in controlling floods;
- These projects can be used for recreation, inland navigation and fish breeding.

Disadvantages:

- Damming of rivers affects their natural flow causing poor sediment flow;



- Excessive sedimentation at the bottom of the reservoir;
- Lack of sediments results in (a) rockier stream bed and (b) poorer habitat for the rivers aquatic life;
- The reservoirs submerge the existing vegetation and soil, leading to its decomposition over time;
- They affect the fertility levels of the soil;
- cause large scale displacement of local communities.

Traditional rainwater harvesting methods practiced in different parts of the country:

- In mountainous areas 'Guls' and 'Kuls' the diversion channels were built for agriculture.
- 'Rooftop rainwater harvesting' was commonly practiced to store drinking water, especially in Rajasthan.
- Inundation channels for irrigation were developed in the flood plains of West Bengal.
- In arid and semi-arid regions, agricultural fields were converted into rain fed storage structures, e.g., 'Khadins' in Jaisalmer and 'Johads' in other parts of Rajasthan.
- In semi-arid and arid regions of Rajasthan, particularly in Bikaner, Phalodi and Banner, all the houses had underground tanks or 'tankas' built inside the house for storing drinking water. They were a part of the well-developed rooftop rainwater harvesting system.

'Narmada Bachao Andolan':

- Narmada Bachao Andolan or Save Narmada Movement is an NGO that mobilized tribal people, farmers, environmentalists and human rights activists against the Sardar Sarovar Dam being built across the Narmada river in Gujarat.
- The movement originally focused on environmental issues related to submerging of trees under the dam water. Recently its aim has been to enable the displaced poor people to get full rehabilitation facilities from the government.

Agriculture - Chapter 4

India is an agricultural country because of the following reasons:

- Two-third of its population is engaged in agricultural activities.
- Agriculture is a primary activity and produces most of the food and food grains.
- It produces raw materials for our various industries, e.g., cotton textile, sugar industry.



- Agricultural products, like tea, coffee, spices are exported and earn foreign exchange.

Primitive Subsistence Farming:

- This type of farming is practiced in few pockets of India on small patches of land using primitive tools and family/community labor. Farmers clear a patch of land and produce cereals and other food crops to sustain their families.
- When the soil fertility decreases, the farmers shift and clear a fresh patch of land for cultivation. This type of shifting allows nature to replenish the fertility of the soil through natural processes. Land productivity is low as the farmer does not use fertilizers or other modern inputs.

Intensive Subsistence Farming:

- It is practiced in areas of high population pressure on land. It is labor intensive farming. Yield per hectare is high because high doses of biochemical inputs and irrigation are used.
- Size of the land-holdings is small and uneconomical. Farmers take maximum output from the limited land by raising 2-3 crops in a year from the same land, i.e., multiple cropping is practiced.

Commercial Agriculture:

- In this, crops are mainly grown for commercial purposes. It is practiced on large pieces of land on scientific and commercial lines using machines and modern technology. There is higher use of modern agricultural inputs, e.g., HYV seeds, fertilizers, irrigation, etc.
- Degree of commercialization varies from one region to another. Rice is a commercial crop in Punjab, while in Odisha it is subsistence crop. E.g., plantation agriculture.

Characteristics of plantation agriculture:

- A single type of crop is grown on a large area. Plantation is carried out on large estates using lot of capital intensive units. Lot of migrant laborers work on these estates.
- Plantation has an interface of agriculture and industry. All the produce is used as raw material in the respective industries. The production is mainly for the market, i.e., commercial agriculture.

Rabi, Kharif and Zaid are the three cropping seasons:

- **Rabi crops (Winter crops):** Sown in winter—October to December. Harvested in summer—April to June. Important crops: wheat, barley, mustard, peas, gram, etc.



- **Kharif crops** (Crops of the rainy season): Sown—onset of monsoon (June-July). Harvested— September-October. Important crops: rice, maize, millets, jowar, bajra, tur (arhar), moong, urad, cotton, jute, groundnut and soyabean.
- **Zaid season:** It is a short cropping season during summer months mainly between March-April and June-July. Main crops— watermelon, musk melon, cucumber etc.

Rice

- **Rice** is the most important food crop (Kharif crop) of India. India holds second position in rice production after China. Cultivation—High temperature of 25° C and above and high humidity with annual rainfall of 100 cms is required.
- Four major regions of rice cultivation are —
 - Plains of North, India;
 - Plains of North-Eastern India;
 - Coastal areas; and
 - Deltaic regions. Irrigated rice is produced in Punjab, Haryana, Western UP and Rajasthan.

Wheat

- **Wheat** is the second most important cereal crop of India. It is the main food crop.
- Cool and moist growing season. Bright sunshine at the time of ripening.
- Rainfall: 50 to 75 cm evenly distributed over the growing season, loamy soil.]
- **Wheat growing zones**— Ganga-Sutlej plains in the North-West and Black soil region of the Deccan.
- **Wheat producing states**—Punjab, Haryana, UP, Bihar, Rajasthan and Madhya Pradesh.

Jowar

- Jowar is the third most important food crop with respect to area and production, kharif crop, rainfed crop grown in moist areas.
- **Major producing states** - Maharashtra, Karnataka, Andhra Pradesh and Madhya Pradesh.

Millets

- **Millets** are called coarse grains. They have high nutritional value, important part of the diet for poor people. Examples:
- **Ragi:** Leading producer is Karnataka, followed by Tamil Nadu. Himachal Pradesh, Jharkhand, Uttaranchal, Sikkim etc. are other important regions.



- **Jowar:** Maharashtra is the leading producer followed by Karnataka, Andhra Pradesh, Madhya Pradesh.
- **Bajra:** It grows well on sandy soils and shallow black soils. Rajasthan is the largest producer followed by Uttar Pradesh, Maharashtra, Gujarat and Haryana.

Maize crop –

- Kharif crop, requires temperature between 21° C to 27° C, requires moderate rainfall between 50-100 cm. It grows well in old alluvial soils.
- Maize is a crop which is used both as food and fodder. In some states like Bihar, maize is grown in rabi season also. Maize production in India has increased due to factors like – use of modern inputs such as HYV seeds; use of fertilisers; and use of irrigation facilities.

Sugar Cane:

- India is the second largest producer of sugarcane after Brazil.
- It is a tropical as well as subtropical crop. It grows well in hot and humid climate. Temperature: 21°C to 27°C. Annual rainfall between 75 cm and 100 cms. Irrigation is required in the regions of low rainfall. It can be grown on a variety of soils. It needs manual labour from sowing to harvesting.
- **Six major states producing sugarcane** – Uttar Pradesh, Maharashtra,
- Karnataka, Tamil Nadu, Andhra Pradesh, Bihar, Punjab and Haryana. Sugarcane is the main source of sugar, gur (jaggery), kandsari and molasses.

Oilseeds:

- India is the largest producer of oil seeds in the world. 12% of the total cropped area is under oilseed production. **Six major oilseeds produced in India – Groundnut, mustard, coconut, sesamum (til), soyabean, castor-seeds, linseed, sunflower and cotton-seeds.**
- Most of these oilseeds are edible and are used as cooking mediums. Some are also used as raw material in the production of soap, cosmetics and ointments.

Tea

- It grows well in tropical and subtropical climates. It requires deep, fertile, well drained soil, rich in humus and organic matter. It requires warm and moist frost free climate round the year.



- Frequent showers evenly distributed through the year ensure continuous growth of tender leaves. Tea is a labour intensive industry. It requires abundant, cheap and skilled labour.

Coffee:

- Most important beverage crop of South India, India produces 4% of the world's coffee production. Major states – Karnataka, Kerala, Tamil Nadu (mainly in Nilgiri hills).

Cotton

- **Cotton** is mainly produced in Maharashtra, Gujarat and Madhya Pradesh. Cotton is the fibre crop which is mainly grown in the black soil of the Deccan Plateau region.
- India is the 3rd largest producer of cotton in the world.
- Requires – high temperature; light rainfall or irrigation; 210 frost-free days; bright sunshine; black cotton soil; Kharif crop and requires 6-8 months to mature.
- Major cotton producing states – Maharashtra, Gujarat, Madhya Pradesh, Karnataka, Andhra Pradesh, Tamil Nadu, Punjab, Haryana and Uttar Pradesh.

Jute:

- Mainly grown in West Bengal, Bihar and Assam, known as golden fibre. Jute is mainly grown in West Bengal, especially in the Hoogly Basin because there the geographical conditions favour its growth. These conditions are –
- High temperature required during the time of growth,
- Jute grows well on well-drained fertile soils in the flood plains where soils are renewed every year.
- **Jute products are** – gunny bags, ropes, mats, carpets, yams and other ornamental artifacts.

Rubber

- Rubber is produced in Kerala, Tamil Nadu and Karnataka, Andaman and Nicobar islands and Garo hills of Meghalaya. Conditions: It requires hot and humid climate. Rainfall – 200 cms. Temperature – above 25° C. Maximum rubber is consumed in the manufacture of auto tyres and tubes and cycle tyres and tubes.

Institutional reforms in Agriculture:

- Collectivization and consolidation of land holdings to make them economically viable.
- The green revolution based on the use of package technology and the White Revolution to increase milk production.
- Cooperation with farmers and Abolition of Zamindari system.



- Provision of crop insurance to protect the farmers against losses caused by natural calamities, i.e., drought, flood, cyclone, fire and disease.
- Establishment of 'Grameen Banks', Cooperative Societies and Banks.
- Kissan Credit Card (KCC), Personal Accident Insurance Scheme (PAIS).
- Special weather bulletins and agricultural programmes for farmers on radio and TV.
- Announcement of minimum support price, remunerative and procurement prices for crops to check the exploitation of farmers.

Minerals and Energy Resources -Chapter 5

Mineral:

- Geologists define mineral as a "homogeneous, naturally occurring substance with a definable internal structure." They have physical and chemical properties by which they can be identified.
- **Rocks** are combinations or aggregates of minerals in varying proportions. Some rocks consist of a single mineral, e.g., limestone while most rocks consist of several minerals.
- Term 'ore' is used to describe an accumulation of any mineral mixed with other elements.

Minerals generally occur in the following forms:

- a) Veins and lodes. In igneous and metamorphic rocks minerals may occur in the cracks, faults or joints by getting solidified in them. The smaller occurrences are called veins and the larger lodes, e.g., metallic minerals like tin, copper, zinc and lead, etc. are found in lodes and veins.
- b) In sedimentary rocks minerals occur in beds or layers. They are formed as a result of deposition, accumulation and concentration in horizontal strata. Some sedimentary minerals are formed as a result of evaporation, especially in arid regions, e.g., gypsum, potash and salt.
- c) Another mode of formation involves decomposition of surface rocks and the removal of soluble contents, leaving a residual mass of weathered material containing ores. Bauxite is formed this way.
- d) Placer deposits. Certain minerals occur as alluvial deposits in sands of valley floors and the base of hills, e.g., gold, silver, tin



and platinum. These are called placer deposits and contain minerals which are not corroded by water.

- e) Ocean waters contain vast quantities of minerals, e.g., common salt, magnesium and bromide are largely derived from the ocean waters. The ocean beds are rich in manganese nodules.

Four types of iron ores are:

Magnetite, Hematite, Siderite and Limonite. **Two best ores are:**

- **Magnetite** – It is the finest iron ore available with upto 70% iron content. It has excellent magnetic qualities and is especially valuable in the electrical industry.
- **Hematite** – It is the most important industrial iron ore in terms of quantity used. It has 50-60% iron content.

Four major iron ore belts:

- Odisha-Jharkhand Belt: Badampahar Mines – High grade hematite ore is found here.
- Durg-Bastar-Chandrapur Belt: Bailadila Mines – Super high grade hematite ore deposits are found in Bailadila range. Iron ore from these mines is exported to Japan and South Korea.
- Bellary-Chitradurga-Chikmagalur Tumkur Belt in Karnataka: Kudremukh Mines – A 100 per cent export unit. The ore is transported as slurry to a port near Mangalore.
- Maharashtra-Goa Belt: Ratnagiri district of Maharashtra – Ores are not of very high quality. Iron ore is exported through Marmagao port.

Aluminium

- Aluminium is obtained from bauxite ore. It is an important metal because – it has the strength of metals such as iron, and is extremely light at the same time; it has good conductivity; and it has great malleability.

Bauxite

- Bauxite deposits are formed by the decomposition of a wide variety of rocks rich in aluminium silicates. Leading State of bauxite production is Odisha, producing 45% of the total bauxite of India.
- Most important bauxite deposits are found in Panchpatmali in Koraput district.
- Other States are Gujarat (17%), Jharkhand (14%) and Maharashtra (11%).

Mica

- Mica is made up of a series of plates or leaves. It splits easily into such thin sheets that a thousand put together are only a



few centimeters thick. Mica is indispensable for electric and electronic industry because it has –

- excellent di-electric strength;
- Low power loss factor; • Insulating properties; and
- Resistance to high voltage.
- **Mica** deposits are found in the northern edge of Chhota Nagpur Plateau. Jharkhand is the leading producer. The important mica producing belt here is Koderma-Gaya-Hazaribagh.

Dangers involved in mining are –

- a) The risk of collapsing mine roofs;
- b) Inundation, i.e., flooding in mines;
- c) Fires in coal-mines is a constant threat to miners; and
- d) Poisonous gases, dust and noxious fumes inhaled by miners make them vulnerable to pulmonary diseases.

Adverse effects of mining on the environment:

- The water sources in the region get contaminated;
- Dumping of the slurry and waste leads to degradation of land and soil; and
- It also leads to an increase in stream and river pollution.

Conservation of minerals is necessary because:

- The formation of minerals takes a long geological period of millions of years.
- They are finite in nature, non-renewable and exhaustible.
- The rate of replenishment of minerals is infinitely small in comparison to rate of consumption.
- They have to be preserved for our future generations.

Methods of mineral conservation:

- We should use minerals in a planned and sustainable manner.
- Improved technologies need to be evolved to allow use of low grade ores at low cost.
- Recycling of metals, using scrap metals and other substitutes.
- Wastage's in mining, processing and distribution should be minimized.

Controlled export of minerals.

- Energy resources can be classified as conventional and non-conventional sources.
- Conventional sources include coal, petroleum, natural gas and electricity (both hydel and thermal). All these sources have been in use for quite some time.



Non-conventional sources of energy are relatively new sources as their large scale generation has started recently. These include solar, wind, tidal, geothermal, biogas and atomic energy.

Coal as an important source of energy:

- It provides a substantial part of the nation's energy needs as it is abundantly available.
- It is used for power generation, to supply energy for industrial and domestic needs.
- India is highly dependent on coal for meeting its commercial needs. Its share in total – 67%.
- It can easily be converted into other forms of energy – electricity, gas, oil, etc.

Coal as an industrial raw material:

1. It is an indispensable raw material for iron and steel industry.
2. It provides raw material for chemical industries and synthetic textile industries.
3. Many coal-based products are processed in industries, e.g., coal tar, graphite, soft coke, etc.
4. Power generation industry is mainly based on this fossil fuel.

Four types of coal and their characteristics:

- a) Anthracite – 1. It is the highest quality hard coal; 2. It contains more than 80% carbon content. It gives less smoke. ,
- c) Bituminous – 1. It is the most popular coal in commercial use and has 60-80% carbon content; 2. Metallurgical coal is high grade bituminous coal and is of special value for smelting iron in blast furnaces.
- d) Lignite – 1. It is a low grade brown coal; 2. It is soft with high moisture content. The main lignite reserve is Neyveli in Tamil Nadu.
- e) Peat – 1. It has a low carbon and high moisture content; 2. It has low heating capacity and gives lot of smoke on burning.

Occurrence of coal:

- Gondwana Coal Belt – A little over 200 million years in age. Mainly metallurgical coal is found in: (a) Damodar Valley Belt (West Bengal, Jharkhand) which contains important coal mines of Jharia, Raniganj and Bokaro; (b) The Godavari Valley Belt; (c) The Mahanadi Valley Belt; and (d) Wardha Valley Belt.
- Tertiary coal deposits are only about 55 million years old, i.e., they are comparatively younger. They occur in North-Eastern



States, namely: (a) Assam (b) Meghalaya, (c) Arunachal Pradesh and (d) Nagaland.

Petroleum:

- It is the second most important energy source of India after coal. It can be easily trans-ported by pipelines and does not leave any residue.
- It provides fuel for heat and light. It provides lubricants for machinery.
- It provides raw material for a number of manufacturing industries.
- It is an important fuel used in transportation sector.
- Petroleum refineries act as a '**nodal industry**' for synthetic textiles, fertilizers and many chemical industries.

Occurrence and formation of petroleum:

- Most of the petroleum occurrences in India are associated with anticlines and fault traps in the rock formations of the tertiary age. In regions of folding anticlines it occurs where oil is trapped in the crest of the upfold. The oil bearing layer is porous limestone or sandstone through which oil may flow.
- Petroleum is also found in fault traps between porous and non-porous rocks.
- **Distribution of petroleum:**
 - **Mumbai High**—It is an offshore oilfield and is the richest oilfield of India. Its share is about 63% of India's petroleum production;
 - **Gujarat**—It produces 18% petroleum of India. Ankaleshwar is the most important field; and
 - **Assam**—It is the oldest oil producing State of India. Its contribution in the total production is 16%. Important oilfields are Digboi, Naharkatiya and Moran-Hugrijan.

Non-Conventional Sources of Energy:

Nuclear Energy:

- Nuclear energy is obtained by altering the structure of atom. When the structure of an atom is altered, too much energy is released in the form of heat.
- This heat is utilised to generate electric power. Uranium and Thorium are used for generating atomic power. These minerals are available in Jharkhand, Aravalli ranges of Rajasthan.

Solar Energy:



- Photovoltaic technology is used to convert solar energy into electricity.
- Largest solar plant of India is located at Madhapur near Bhuj. Solar energy holds great promises for the future. It can help in minimizing the dependence on firewood and animal dung cakes in rural areas. This will also help in conservation of fossil fuels.

Wind Power:

- Wind farm cluster in Tamil Nadu (from Nagarcoil to Madurai) is the largest cluster in India. Andhra Pradesh, Karnataka, Gujarat, Kerala, Maharashtra and Lakshadweep are also important centres of wind power production. India is now a "Wind Super Power" in the world.

Biogas:

- Biogas can be produced from shrubs, farm waste, and animal and human waste. It is more efficient than kerosene, dung cake and charcoal.
- Biogas plants can be set up at municipal, cooperative and individual levels. The gobar gas plants provide energy and also manure.

Tidal Energy:

- Dams are built across inlets. The water flows into the inlet during high tide and gets trapped when the gate is closed. Once the tide recedes, the floodgates are opened so that water can flow back to the sea.
- Flow of water is used to run the turbine to generate electricity. A 900 mw tidal energy power plant is set up by the National Hydropower Corporation in the Gulf of Kutch.

Geo Thermal Energy:

- We know that the inside of the earth is very hot. At some places, this heat is released on the surface through fissures. Groundwater in such areas becomes hot and rises up in the form of steam.
- This steam is used to drive turbines. Two geo thermal energy projects—the Parvati valley near Manikam in Himachal Pradesh and the Puga valley in Ladakh.

Importance of energy:

- Energy is required for all activities. It is needed to cook, to provide light and heat, to propel vehicles and to drive machinery in industries.
- It is the basic requirement for economic development. Every sector of national economy – **agriculture, industry, transport**

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and commerce needs greater inputs of energy. Energy demands, in the form of electricity, are growing because of increasing use of electrical gadgets and appliances.

Ways to conserve energy:

- Using more of public transport system instead of individual vehicles.
- Switching off electrical devices when not in use, using power saving devices.
- Using non-conventional sources of energy such as solar energy, wind energy, etc.
- Getting the power equipment regularly checked to detect damages and leakages.

Manufacturing Industries - Chapter 6

Manufacturing.

- Production of goods in large quantities after processing from raw materials to more valuable products is called manufacturing. Manufacturing belongs to secondary sector in which the primary materials are processed and converted into finished goods.

Importance of manufacturing industries for India:

- It helps in modernizing agriculture, reduces heavy dependence on agricultural income by providing jobs in non-agricultural sectors.
- Industries help in creating jobs and generating more income.
- Export of manufactured goods expands trade and brings in foreign exchange.
- Industrial development brings prosperity to the country.

Agriculture and industry in India are interdependent on each other:

- Agro-industries in India have boosted agriculture by raising its productivity. Industries depend on agriculture for their raw materials, e.g. cotton textile industry. Industries provide many agricultural inputs like irrigation pumps, fertilizers, insecticides, PVC pipes, machines and tools, etc. to the farmers.
- Development of different modes of transport by industrial sector has not only helped farmers to obtain agricultural inputs but has also helped them trade their products.

Factors which affect the location of an industry



- **Raw material.** Cheap and abundant availability of raw material.
- **Labour.** Availability of cheap labor is necessary for low cost of production low.
- **Power.** Cheap and continuous supply of power is extremely necessary.
- **Capital.** It is necessary for developing infrastructure, for the entire manufacturing process and for meeting manufacturing expenditure.
- **Banking and insurance facilities,** favorable government policies.

Five basis on which industries are classified.

1. On the basis of source of raw materials used – Agro-based and mineralbased.
2. According to their main role – Basic and Consumer industries.
3. On the basis of capital investment – Small-scale and large-scale industries.
4. On the basis of ownership – Public Sector, Private Sector, **Cooperative Sector, Joint Sector.**
5. Based on the bulk and weight of raw material and finished goods – Heavy industries, Light
 - If the investment is more than one crore rupees in any industry, it is considered as a large scale industry. For example, Iron and **Steel industry, Cement industry.**
 - If the investment is less than one crore rupees, it is considered as a small scale industry.

Agro-based industries:

- They obtain their raw materials from agricultural products. Example: Textiles— cotton, jute, silk and woolen. Rubber, Sugar, Coffee, Tea and Edible Oil, etc.

Mineral-based industries:

- They obtain their raw materials from minerals. Example: Iron and steel, cement, machine tools, petro-chemicals, etc.

Four types of industries based on ownership are:

1. **Public Sector industries:** Owned and operated by government agencies, e.g., BHEL, SAIL, etc.
2. **Private Sector industries** are owned and operated by an individual or a group of individuals, e.g., TTSCO, Bajaj Auto Ltd., Dabur Industries.



3. **Joint Sector industries** are jointly run by the Public (government) and Private Sector (individuals), e.g., Oil India Ltd.
4. **Cooperative Sector** industries are owned and operated by the producers or suppliers of raw materials, workers, or both. They pool in the resources and share the profits or losses proportionately, e.g., sugar industry in Maharashtra and coir industry in Kerala.

Textile industry

- Textile Industry occupies a unique position in the Indian Economy because
- It contributes significantly to industrial production (14%). It employs largest number of people after agriculture, i.e., 35 million persons directly. Its share in the foreign exchange earnings is significant at about 24.6%. It contributes 4% towards GDP and is the only industry in the country which is self-reliant and complete in the value chain.
- Factors for concentration/location of cotton textile industry in **Maharashtra and-Gujarat:**
- Availability of raw cotton was abundant and cheap.
- Moist climate in these coastal States also helped in the development of cotton textile industry because humid conditions are required for weaving the cloth, else the yarn breaks.
- Well-developed transportation system and accessible port facilities in Maharashtra and Gujarat.
- Proximity to the market as cotton clothes are ideal to wear in these warm and humid States.

Problems faced by the cotton textile industry:

- Power supply is erratic in our country. Machinery needs to be upgraded, especially in weaving and processing sectors. Low output of labor. We still need to import cotton in spite of the fact that the production of cotton in the country has increased. Stiff competition from the synthetic fiber industry.
- Factors responsible for the concentration of jute industry on the banks of Hoogly:
- Proximity of the jute producing areas to the Hoogly Basin.
- Inexpensive water transport provided by the Hoogly river.
- It is well connected by a good network of railways, waterways and roadways.
- Abundant water for processing raw jute.



- Availability of cheap labor from West Bengal, Bihar, Odisha and Uttar Pradesh.
- Kolkata as a port and large urban centre, provides banking, insurance and port facilities.

Reasons for location of sugar mills close to the fields:

- Raw material used, sugarcane is bulky and perishable.
- It cannot be transported to long distances because its sucrose content dries up fast, so it should be processed within 24 hours of its harvest.
- Sugar Industry is shifting towards southern and western States, because— Cane produced here has higher sucrose content, the favorable climatic conditions (cooler climate) ensure a longer growing and crushing season.
- Cooperatives are more successful in these States. Sugar industry being seasonal in nature, is ideal for the cooperative sector. Yield per hectare is higher in southern States.

Iron and steel industry:

- It is a basic or key and heavy industry.
- Iron and steel industries is concentrated in and around **Chhotanagpur Plateau**
- Region because Low cost of iron-ore which is mined here;
- High grade raw materials in close proximity;
- Availability of cheap labour;
- Vast growth potential in the home market;
- Efficient transport network for their distribution;
- Availability of power because this region has many thermal and hydel power plants;
- Liberalisation and FDI.

Aluminium: Characteristics

- It is a light metal; resistant to corrosion; good conductor of heat; It is malleable and becomes strong when mixed with other metals.

Uses of aluminium:

- It is used for manufacturing aircraft's;
- It is used for making utensils and packing material;
- It is used for making wires;
- It has gained popularity as a substitute of steel, copper, zinc and lead in a number of industries.

Electronic industry:

- It produces a wide range of products from transistor sets to televisions and computers for the masses.



- It has helped us set up telephone exchanges, telephones, cellular telecom, radios and many other equipment which have application in space technology, aviation, defence, meteorological departments, etc.
- It has generated employment for many people. This industry has been a major foreign exchange earner because of its fast-growing Business Process Outsourcing (BPO) Sector.
- India is one of the leading countries in software development. We have 18 software technology parks which provide high data communication facility to software experts.

Industrial pollution and its types:

- Air pollution. Smoke is emitted by chemical and paper factories, brick kilns, refineries and smelting plants, and burning of fossil fuels in factories that ignore pollution norms. Air-borne particulate materials contain both solid and liquid particles like dust, sprays, mist and smoke.

Water pollution.

- Major water pollutants are dyes, detergents, acids and salts. Heavy metals like lead and mercury, pesticides and fertilizers and synthetic chemicals with carbon, plastics and rubber, etc. discharged in the water bodies without treatment pollute these water bodies.

Noise pollution.

- Generators, compressors, machines, furnaces, looms, exhaust fans, etc. used by industries create a lot of noise. Noise can raise blood pressure and can have physiological effects as well.

Land pollution.

- Land and water pollution are closely related. Dumping of industrial wastes especially glass, harmful chemicals, industrial effluents, packing, salts and garbage into the soil.

Thermal pollution.

- Wastes from nuclear power plants, nuclear and weapon production facilities cause cancer and birth defects.

Measures to control air pollution:

- Particulate matter in the air can be reduced by fitting smoke stacks to factories with fabric filters, electrostatic precipitators etc.
- Equipment's to control aerosol emissions can be used in industries, e.g., electrostatic precipitators, scrubbers and inertial separators.



- Smoke can be reduced by using oil or gas instead of coal in factories.

Water pollution caused by industries can be controlled by:

Minimizing the use of water for processing by reusing and recycling.

- Harvesting of rain-water to meet water requirements of industries and other domestic purposes.
- Treating hot water and effluents before releasing them in rivers and **ponds in the following ways:** Primary treatment by mechanical means such as screening, grinding, flocculation and sedimentation. Secondary treatment by biological process. Tertiary treatment by biological, chemical and physical processes. This involves recycling of waste water.
- Pro-active approach adopted by the National Thermal Power Corporation (NTPC) for preserving the natural environment and resources.
- Optimum utilization and up-gradation of equipment by adopting latest techniques.
- Minimizing waste generation by maximizing ash utilization.
- Providing green belts for nurturing ecological balance.
- Reducing environmental pollution through ash pond management, ash water recycling system and liquid waste management.
- Ecological monitoring, reviews and online data base management for all its power stations.

Steps to minimize the environmental degradation caused by industrial development:

- Minimizing use of water for processing by reusing and recycling in two or more successive stages. Harvesting of rain water to meet domestic and industrial water requirements.
- Treating hot water and effluents before releasing them in rivers and ponds.
- Particulate matter in the air can be reduced by fitting smoke to factories with electrostatic precipitators, fabric filters, scrubbers and inertial separators. Smoke can be reduced by using oil or gas instead of coal in factories.
- Machinery and equipments can be fitted with silencers to prevent noise pollution.

Lifelines of National - Chapter 7

Means of transport and communication—lifelines of our national economy:



- They help in – increasing cooperation and assistance between countries; easy movement of goods and material between countries; trade and commerce within the country;
- reducing distances thus bringing the world closer;
- both production and distribution of goods; and movement of large number of people and over long distances.

Roadways:

- Importance of road transport vis-a-vis rail transport –
- Construction cost of roads is much lower than that of railway lines.
- Roads can traverse comparatively more dissected and undulating topography.
- Roads can negotiate higher gradients of slopes and as such can traverse mountains such as the Himalayas.
- Road transport is economical in transportation of few persons and relatively smaller amount of goods over short distances.
- It also provides door-to-door service, thus the cost of loading and unloading is much lower.
- Road transport is also used as a feeder to other modes of transport.

Six classes of roads in India according to their capacity:**1. Golden Quadrilateral Super Highways:**

- It's a major road development project linking Delhi- Kolkata- Chennai-Mumbai and Delhi by six-lane Super Highways.
- The North-South corridors linking Srinagar (Jammu & Kashmir) and
- Kanyakumari (Tamil Nadu), and East-West Corridor connecting Silcher
- (Assam) and Porbander (Gujarat) are part of this project. '
- They are made to reduce the time and distance between the mega cities of India.

2. National Highways:

- National Highways link all Major cities of extreme parts of the country. These are the primary road systems and are maintained by the Central Public Works Department (CPWD). The National Highway 7 between Varanasi and Kanyakumari is the longest highway of India.

3. State Highways:

- Roads linking a state capital with different district headquarters. These roads are constructed and maintained by



State Public Works Department in State and Union Territories.

4. District Roads:

- These roads connect the district headquarters with other places of the district. These roads are maintained by the Zila Parishad.

5. Other Roads:

- Rural roads, which link rural areas and villages with towns, are classified under this category. Under the Pradhan Mantri Grameen Sadak Yojana scheme special provisions are made so that every village in the country is linked to a major town in the country by an all season motorable road.

6. Border Roads:

- Border Roads Organisation constructs and maintains roads in the bordering areas of the country. These roads are of strategic importance in the northern and northeastern border areas.

Importance of Railways in India:

- They are the principal mode of transportation for freight and passengers in India.
- Railways also make it possible to conduct different activities like business, sightseeing, and pilgrimage along with transportation of goods over longer distances.
- Indian Railways plays a role of national integration. Railways in India bind the economic life of the country as well as accelerate the development of the industry and agriculture.

Factors which influence the distribution pattern of Railway network in India:

- Distribution pattern of the Railway network in the country has been largely influenced by physiographic, economic and administrative factors.
- Density railway network is high in the northern plains because they are vast level land, have high population density and rich agricultural resources.
- In the hilly terrains of the peninsular region, railway tracts are laid through low hills, gaps or tunnels therefore it difficult to construct railway lines.
- Himalayan mountainous regions too are unfavorable for the construction of railway lines due to high relief, sparse population and lack of economic opportunities.
- It was difficult to lay railway lines on the sandy plain of western Rajasthan, swamps of Gujarat, forested tracks of Madhya Pradesh, Chhattisgarh, Odisha and Jharkhand.



Importance of Pipelines in India:

- In the past, these were used to transport water to cities and industries. Now, these are used for transporting crude oil, petroleum products and natural gas from oil and natural gas fields to refineries, fertilizer factories and big thermal power plants. Solids can also be transported through a pipeline when converted into slurry.
- Because of pipelines refineries like Barauni, Mathura, Panipat and gas based fertilizer plants could be located in the interiors of India.
- Initial cost of laying pipelines is high but subsequent running costs are minimal.
- It rules out trans-shipment (during transportation) losses or delays.

Three important networks of pipeline transportation in the country:

1. From oil field in upper Assam to Kanpur (Uttar Pradesh).
2. From Salaya in Gujarat to Jalandhar in Punjab.
3. Gas pipeline from Hazira in Gujarat connects Jagdishpur in Uttar Pradesh,

Importance of water transport:

- Waterways are the cheapest means of transport. They are most suitable for carrying heavy and bulky goods. It is a fuel-efficient and environment friendly mode.

National Waterways by the Government

- Ganga river between Allahabad and Haldia (1620 km)-N.W. No.1
- Brahmaputra river between Sadiya and Dhubri (891 km)-N.W. No.2
- West-Coast Canal in Kerala (Kottapuram-Komman, Udyogamandal and Champakkara canals-205 km)-N.W. No.3

Major Sea Ports:

- **Kandla:** It was the first port developed soon after Independence. It was developed to ease the volume of trade on the Mumbai port. Kandla is a tidal port.
- **Mumbai:** It is the biggest port with a spacious natural and well-sheltered harbour.
- The Jawaharlal Nehru port: It was planned with a view to decongest the Mumbai port and serve as a hub port for this region.



- **Martnagao port (Goa):** It is the premier iron ore exporting port of the country. This port accounts for about fifty per cent of India's iron ore export.
- **New Mangalore port:** It export iron ore from Kudremukh mines.
- **Kochi:** It is the located at the entrance of a lagoon with a natural harbour.
- **Tuticorin, in Tamil Nadu:** This port has a natural harbour. It trades a large variety of cargoes to our neighbouring countries like Sri Lanka, Maldives, etc.
- **Chennai:** It is one of the oldest artificial ports of the country. It is ranked next to Mumbai in terms of the volume of trade and cargo.
- **Vishakhapatnam:** It is the deepest landlocked and well-protected port. This port was developed as a port for iron ore exports.
- **Paradip port:** It is located in Odisha. It specialises in the export of iron ore.
- **Kolkata:** It is an inland riverine port. This port serves a very large and rich hinterland of Ganga- Brahmaputra basin. Being a tidal port, it requires constant dredging of Floogly River.
- **Haldia port:** It was developed as a subsidiary port, in order to relieve growing pressure on the Kolkata port.

Importance of Airways:

- Air travel, today, is the fastest, most comfortable and prestigious mode of transport. It can cover very difficult terrains like high mountains, dreary deserts, dense forests and also long oceanic stretches with great ease.
- Air travel has made access easier in the north-eastern part of the country which has big rivers, dissected relief, dense forests and frequent floods and international frontiers.

Communication:

Two major means of communication in India:

- **Personal communication** including letter, email, telephone, etc.
- **Mass communication** including television, radio, press, films, etc.
- Different types of mail handled by Indian postal department:
- First class mail: Cards and envelopes are airlifted between stations covering both land and air.



- Second class mail: includes book packets, registered newspapers and periodicals. They are carried by surface mail, covering land and water transport.

Importance of mass communication:

- Mass communication provides entertainment. They create awareness among people about various national programmes and policies.
- They provide variety of programmes in national, regional and local languages for various categories of people, spread over different parts of the country.
- They strengthen democracy in the country by providing news and information to the masses. It helps in agriculture sector by helping farmers by providing them information about new agricultural practices.
- Doordarshan is the national television channel of India. It is one of the largest terrestrial networks in the world. The largest numbers of newspapers published in the country are in Hindi, followed by English and Urdu. India is the largest producer of feature films in the world.

International Trade:

- International trade is defined as the exchange of goods and services between two or more countries.
- It is also considered as economic barometer because advancement of international trade of a country leads to economic prosperity.
- Income earned from international trade constitutes a major part in the net national income. Large international trade leads to revival of domestic economy.

Balance of trade:

- Difference between export and import is known as balance of trade.
- If the value of exports is more than the value of imports, it is called favorable balance of trade. And if the value of imports is greater than the value of exports it is known as unfavorable balance of trade.
- Favorable balance of trade is regarded good for the economic development where as unfavorable balance of trade is seen harmful for the domestic economy.

Importance of tourism as a trade:

- Tourism in India earns huge Foreign exchange,
- Over 2.6 million foreign tourists visit India every year.



Notes

- More than 15 million people are directly engaged in the tourism industry.
- Tourism also promotes national integration,
- It provides support to local handicrafts and cultural pursuits.
- It also helps in the development of international understanding about our culture and heritage.
- Foreign tourists visit India for heritage tourism, eco tourism, adventure tourism, cultural tourism, medical tourism and business tourism.
- Rajasthan, Goa, Jammu and Kashmir and temple towns of south India are important destinations of foreign tourists in India.
- There is vast potential of tourism development in the north-eastern states and the interior parts of Himalayas, but due to strategic reasons these have not been encouraged so far

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