

UNIT 2 : CONTEMPORARY INDIA - II

CHAPTER 1 : Resources and Development

RESOURCES : TYPES AND PLANNING

- **Resource** : Natural endowments in the form of land, water, vegetation and minerals are called **natural resources**. Resources are materials which can be transformed in such a way that they become more valuable and useful for fulfilling human needs.
- **Resources can be classified in the following ways :**
 - (a) **On the basis of origin :**
 - (i) **Biotic** – Resource obtained from biosphere having life such as human beings, flora and fauna, fisheries etc.
 - (ii) **Abiotic** – Things which are composed of non-living thing such as rocks and metals.
 - (b) **On the basis of exhaustibility :**
 - (i) **Renewable** – Some resource can be renewed or reproduced by physical, chemical or mechanised processes. *For example* : Solar and wind energy, water forests and wildlife.
 - (ii) **Non-Renewable** – These occur over a very long geological time. Minerals and fossil fuels are examples of such resources.
 - (c) **On the basis of ownership :**
 - (i) **Individual** – These resources are owned by private individuals. Plantation, pasture lands, ponds, water in wells etc are example of individual resources.
 - (ii) **Community** – These are resources which are accessible to all the members of the community. Village common grazing grounds, burial grounds, village ponds, etc., are example of community resources.

(iii) National – All resources belong to the nation. All the minerals, water resource, forests, wildlife, land within the political boundaries and oceanic area upto 12 nautical miles (19.2 km) from the coast termed as territorial water and resources therein belong to the nation.

(iv) International – These are international institutions which regulate some resources. *For example:* the oceanic resources beyond 200 nautical miles of the Exclusive Economic Zone belong to open ocean and no individual can use it without the concurrence of international institutions.

(d) On the basis of development :

(i) Potential – These are resource found in a region but have not been utilized. *For example :* Rajasthan and Gujarat have enormous potential for development of solar and wind energy but till now it has not been put to use.

(ii) Developed – These are resources which are surveyed and their quality and quantity have been determined for utilization.

(iii) Stock – These are materials in the environment which have the potential to satisfy human needs but human beings do not have the appropriate technology to access these.

(iv) Resource – These are the subset of the stock which can be put into use with the help of existing technical 'know how' but their use has not been started.

➤ **Resource Planning :** This is a technique or skill of proper utilization of resources. Resource planning consists of three stages –

- **Identification and inventory of resources** – involves surveying, mapping and measurement of characteristics and properties of resources.
- **Implementation** of resource development plans, which involves creating a planning structure equipped with appropriate technology, skill and institutional set up.
- **Matching** the resources development plans with overall national development plans.

LAND AND SOIL AS RESOURCE

➤ **Land resources :** India has a variety of relief features like mountains, plateaus and plains. 43% of the country is covered by plains and they provide cultivable land for growing crops. 30% of the country is covered by mountains and they provide natural resources like forests and wildlife. 27% of the country is covered by plateaus which contain mineral resources, forests and some arable land.

➤ Total geographical area of India is 3.28 million square kilometres. 46.24% land of the total land area of India is the net sown area. 45.26% is covered by forests, 4.17% is cultivable waste, 3.37% is fallow land, 4.71% are permanent pastures, 4.95% land is not available for cultivation and 1.50% is covered by miscellaneous tree crops.

➤ The **land use pattern** in India is determined by both physical factors such as topography, climate, soil types as well as human factors such as population density, technological capability, culture and traditions etc.

➤ The degradation of natural vegetation is caused by overgrazing by animals, deforestation, careless management of forests and degradation of land. At present, about 130 million hectares of degraded land exists in India.

➤ **Soil as a Resource :** Soil is the most important renewable natural resource. The uppermost layer of the earth's crust, which is loose, fragmented and useful for plants is called soil.

➤ **Soil Formation :** The factors that contribute to the formation and fertility of the soil are parent rocks, climate, plant, animal and local topography. The soils are made out of rocks.

- The rocks disintegrate and decompose under the processes of weathering and erosion.

➤ **Soil Types** : The soils of India are classified into the following types –

1. Alluvial Soil 2. Black Soil 3. Red and Yellow Soil 4. Laterite Soil 5. Arid Soil 6. Forest Soil 7. Mountain Soil.

- **Alluvial Soil** : It is of two types – *Khadar* and *Bangar*. It is found mainly in the Northern Plains and Coastal Strips of the Eastern Coast.
 - **Black Soil** : It is derived from the Deccan Traps. It occurs in areas like Maharashtra, Western Madhya Pradesh and Gujarat. It is known for the cultivation of cotton.
 - **Red and Yellow Soil** : This soil develops on crystalline igneous rocks in area of low rainfall in the eastern and southern parts of the Deccan plateau. Yellow and red soil are also found in parts of Odisha, Chhattisgarh.
 - **Mountain Soil** : It is characterised by the deposition of organic materials derived from the vegetative covers. It is found in Meghalaya, Arunachal Pradesh, Eastern ranges, Uttarakhand, Himachal Pradesh, and Jammu & Kashmir
 - **Laterite Soil** : It is the intensively leached soil of the monsoon climate. It is found in the hills of the Deccan, Karnataka, Kerala, Odisha and parts of Assam and Meghalaya.
 - **Arid Soil** : It is found in the arid areas of Rajasthan, Punjab and Haryana.
 - **Forest Soil** : These soils are found in the hilly and mountainous areas where sufficient rain forests exists. They are found in the source covered areas of the Himalayas.
- **Soil Erosion** : The removal of soil from one place to another by some natural agent is called soil erosion. Conservation of lands and various methods such as contour ploughing, terrace farming, shelter belts, plantation of trees etc., are the methods adopted to reduce soil erosion.
- **Measures for Soil Conservation**
- Contour ploughing
 - Terrace farming
 - Strip cropping
 - Shelter belts of trees
 - Plugging of gullies
 - Afforestation
 - Control of mining activities

CHAPTER 2 : Forest and Wildlife

CONSERVATION OF FOREST AND WILDLIFE IN INDIA

- **Conservation** in the background of rapid decline in wildlife population and forestry has become essential.
- **Conservation** preserves the ecological diversity and our life support systems – water, air and soil.
- Some estimates suggest that at least 10 per cent of India's recorded wild flora and 20 per cent of its mammals are on the threatened list.
- In the 1960s and 1970s, conservationists demanded a national wildlife protection programme.
- **The Indian Wildlife (Protection) Act** was implemented in 1972, with various provisions for protecting habitats.
- The Central Government also announced several projects for protecting specific animals, which were gravely threatened, including the tiger, the one-horned rhinoceros, the Kashmir stag or hangul, three types of crocodiles – fresh water crocodile, saltwater crocodile and the Gharial, the Asiatic lion, and others.

TYPES AND DISTRIBUTION OF FORESTS AND WILDLIFE RESOURCES

- In India, forest and wildlife resources are owned and managed by the government through the Forest Department or other government departments. These are classified under the following categories.
 - (i) Reserved Forests:** More than half of the total forest land in India has been declared reserved forests.
 - (ii) Protected Forests:** Forest Department has declared one-third of the total forest area as protected forest.
 - (iii) Unclassed Forests:** These are the forests and wastelands which belong to both government and private individuals and communities. North-eastern states and parts of Gujarat have a very high percentage of their forests as unclassified forests.
- Reserved and protected forests are also referred to as **permanent forests**, which are maintained for the purpose of producing timber and other forest produce, and for protective reasons. Madhya Pradesh has the largest area under permanent forests.

COMMUNITY AND CONSERVATION

- Conservation of the forest and wildlife resources is very important. Here are a few steps were taken by common people.
- In **Sariska Tiger Reserve**, Rajasthan, villagers have fought against mining by citing the Wildlife Protection Act.
- The inhabitants of five villages in the Alwar district of Rajasthan have declared 1,200 hectares of forest as the Bhairodev Dakav 'Sonchuri'. Villages came up with their own set of rules and regulations which do not allow hunting. They are also protecting the wildlife against any outside encroachments.
- The famous **Chipko Movement** in the Himalayas was one successful attempt to resist deforestation in several areas. The movement has also resulted in community afforestation.
- Farmers and citizen's groups like the **Beej Bachao Andolan** in Tehri and Navdanya have shown that adequate levels of diversified crop production without the use of synthetic chemicals are possible and economically viable.
- India's **Joint Forest Management (JFM)** programme furnishes a good example for involving local communities in the management and restoration of degraded forests.

CHAPTER 3 : Water Resources

WATER SCARCITY AND THE NEED FOR WATER CONSERVATION AND MANAGEMENT

- The availability of water resources varies over space and time.
- Water scarcity is caused by over-exploitation, excessive use and unequal access to water among different social groups.
- Water resources are being over-exploited to expand irrigated areas for dry-season agriculture.
- In some areas, water is sufficiently available to meet the needs of the people. But, those areas still suffer from water scarcity due to bad quality of water.

The need of the hour is to conserve and manage our water resources:

- (i)** To safeguard ourselves from health hazards.
- (ii)** To ensure food security, continuation of our livelihoods and productive activities.
- (iii)** To prevent degradation of our natural ecosystems.

MULTI PURPOSE RIVER PROTECTS AND INTEGRATED WATER RESOURCES MANAGEMENT

- The history reveals use of many sophisticated hydraulic structures from ancient times, such as dams of stone, reservoirs or lakes, embankments and canals for irrigation.
- We have continued this tradition in modern India by building dams in most of our river basins.
- A **dam** is a barrier across flowing water that obstructs, directs or retards the flow, often creating a reservoir, lake or impoundment. "Dam" refers to the reservoir rather than the structure.
- Dams are referred to as **multipurpose projects**.
- **Damodar Valley Corporation** — built on river Damodar — beneficiary states are Jharkhand and West Bengal.
- **Bhakra Nangal** — built on river Sutlej — beneficiary states are Punjab, Haryana and Rajasthan, Himachal Pradesh.
- **Hirakud** — built on river Mahanadi — beneficiary state is Odisha.
- **Kosi** — built on river Kosi — beneficiary state is Bihar and our neighbouring country Nepal.
- **Chambal Valley** — built on river Chambal — beneficiary states are Madhya Pradesh and Rajasthan.

USES OF DAM :

- Dams are built:
 - (i) To impound rivers and rainwater that can be used later to irrigate agricultural fields.
 - (ii) For electricity generation.
 - (iii) Water supply for domestic and industrial uses.
 - (iv) To control floods.
 - (v) For recreation, inland navigation and fish breeding.

OBJECTION TO THE PROJECTS

- Most of the objections to the projects arose due to their failure to achieve the purposes for which they were built.
- Most of the dams were constructed to control floods but, these dams have triggered floods.
- Dams have also caused extensive soil erosion. Excessive use of water has resulted in earthquakes, caused water-borne diseases and pests and pollution.

RAIN WATER HARVESTING

- Rainwater harvesting is a simple method by which rainfall is collected for future usage. The collected rainwater may be stored, utilised in different ways or directly used for recharge purposes.
- Different methods have been adopted in different areas for rain water harvesting.
 - (i) In hill and mountainous regions, people have built diversion channels like the '**guls**' or '**kuls**' of the Western Himalayas for agriculture.
 - (ii) "**Rooftop rainwater harvesting**" is commonly practised to store drinking water, particularly in Rajasthan.
 - (iii) In the flood plains of Bengal, people developed inundation channels to irrigate their fields.
 - (iv) In arid and semi-arid regions, agricultural fields were converted into rain-fed storage structures that allowed the water to stand and moisten the soil such as '**khadins**' in Jaisalmer and '**Johads**' in other parts of Rajasthan.

- (v) The tankas are part of the well-developed rooftop rainwater harvesting system and are built inside the main house or the courtyard. This is mainly practised in Rajasthan, particularly in Bikaner, Phalodi and Barmer areas for saving the rainwater. Many houses have constructed underground rooms adjoining the 'tanka' to beat the summer heat as it would keep the room cool.
- Tamil Nadu is the first state in India which has made rooftop rainwater harvesting structure compulsory to all the houses across the state.

CHAPTER 4 : Agriculture

TYPES OF FARMING, CROPPING PATTERN AND MAJOR CROPS

Agriculture means land cultivation. It also includes animal husbandry and fishing.

- At present in different parts of India, the types of farming being carried out are primitive subsistence farming, intensive subsistence farming and commercial farming.
- Primitive subsistence farming is characterised by small and scattered landholdings and use of primitive tools. The farmers do not use fertilisers and high-yielding varieties of seeds.
- Intensive subsistence farming is carried out in the areas with high population pressure on land. Irrigation, fertilisers and pesticides are used to get maximum output from limited land. Various machines are introduced.
- Commercial farming is characterised by use of higher doses of modern inputs in order to obtain higher productivity.
- Plantation farming, a form of commercial farming, involves growing of a single crop on a large area.
- In India, there are three crop seasons –
 - Kharif, Rabi, Zaid.
- **Kharif** : It starts with the onset of the monsoon and continues till the beginning of winter (June-July to September-October). The kharif crops include rice, maize, millet, cotton, jute, groundnut, moong, urad, etc.
- **Rabi** : It starts with the beginning of winter and continues till the beginning of summer (October-December to April-June). The rabi crops include wheat, barley, gram and oilseeds.
- **Zaid** : This is a short crop season in between the rabi and the kharif season. Crops like watermelons, muskmelons, cucumber, some vegetables and fodder crops are the major crops.
- India produces a wide variety of crops, namely cereals, pulses and oilseeds, fibre crops, beverage crops, cash crops.
- **Cereals** : It covers about three-fourth of the total cropped area of the country. The principal cereals grown in India are – rice, wheat, millets, maize, pulses.
- **Rice** : It requires a temperature between 20° to 27°C and a rainfall above 100 cm.
- **Wheat** : It requires a temperature between 16° to 22°C and a rainfall between 50-75 cm.
- **Millets** : Jowar, Bajra, Ragi.
- **Fibre crops** : Cotton, Jute, Hemp and natural silk are the two important fibre crops grown in India.
- **Beverage crops** : Tea and coffee are important beverage crops.
- **Cash crops** : The major cash crops are sugarcane, rubber, tobacco, spices and fruits and vegetables.
- India is the largest producer of oil-seeds in the world. Main oil-seeds produced in India are groundnut, mustard, coconut, sesame (til), soyabean, castor seeds, cotton seeds, linseed and sunflower. Most of these are edible and used as cooking mediums.
- Horticulture is the science and art of growing plants (fruits, vegetables, flower, etc.). India is the largest producer of fruits and vegetables in the world. India is the producer of tropical as well as temperate fruits. India produces about 13 % of the world's vegetables
- Sericulture, or silk farming is the cultivation of silkworms to produce silk.

TECHNOLOGICAL AND INSTITUTIONAL REFORMS

- Persian wheel has been replaced by water pump, the plough by tiller and harrow drawn by tractor, the bullock cart by truck.
- Flooding of fields is being replaced by **drip irrigation**. Chemical fertilisers took the place of farm manure.
- Chemical fertilisers are being replaced by bio-fertilisers.
- The technological advancements gave birth to **Green Revolution, White Revolution** or **Operation Flood**.
- The Government abolished the Zamindari System.
- Radio and television inform the farmers about new improved techniques of farming.
- Rural banks, cooperative societies and **Kisan Credit Card** ensure easy availability of funds to farmers.
- Collectivization, consolidation of holding, co-operation and abolition of zamindari, etc. were given priority to bring about institutional reforms in the country after independence.
- Subsidy on fertilisers has decreased leading to increase in the cost of production.
- The high MSP, subsidies on inputs and committed FCI purchases has distorted the cropping pattern. This has also created a serious imbalance in the inter-crop parities.
- The Government of India made concerted efforts to modernise agriculture by establishing the **Indian Council of Agricultural Research (ICAR)**, agricultural universities, veterinary services and animal breeding centres, horticulture development, research and development in the field of meteorology and weather forecast, etc.
- Kisan Credit Card (KCC) and Personal Accident Insurance Scheme (PAIS) are the two other schemes introduced by the Government of India for the benefit of the farmers.
- In order to ensure the availability of food to all sections of society, our government carefully designed a national food security system. It consists of two components – (a) buffer stock and (b) public distribution system (PDS).
- The FCI procures food grains from the farmers at the government announced minimum support price (MSP).
- **Globalisation** has exposed the Indian farmers to new challenges.
- Today, organic farming is much in vogue because it is practiced without factory made chemicals, such as, pesticides and fertilizers.
- Indian farmers should diversify their cropping pattern from cereals to high value crops. This will increase incomes and reduce environmental degradation simultaneously.

CHAPTER 5 : Mineral and Energy Resources

MINERALS AND THEIR MODE OF OCCURRENCE

- Mineral is homogenous naturally occurring inorganic substances with a definable internal structure.
- Found in rocks beneath the earth's surface in the form of compounds.
- Possess a solid crystal structure. Having a definite chemical composition comprising one or more elements.
- Can be identified by their physical and chemical properties.
- Different appearances and occurrence in various forms, in a wide range of colours, hardness forms lustre and density. As all minerals are formed from a certain combination of elements which depends upon the chemical and physical conditions under which the mineral forms. The geologists use these properties to categorise minerals.

IMPORTANCE OF MINERALS :

- Everything we use, eat and drink has minerals.
- Economic development of people or nations can be vastly accelerated by the presence of valuable minerals in the countries.
- Make our life comfortable and convenient.
- They are also responsible for all the biological processes on the earth.

ROCKS CONTAINING MINERALS :

- Rocks are combinations of homogenous substances called minerals. It is the minerals that impart their texture, colour, shape, hardness or softness to rocks.
For e.g., limestone is a rock which consists a single mineral.
- Majority of rocks on the earth's crust are a combination or an aggregate of different minerals in varying quantities.
- Although over 2000 minerals have been identified so far; only a few are abundantly found in most of the rocks.

MODE OF OCCURRENCE OF MINERALS

- In **igneous and metamorphic rocks** – The smaller occurrences are called veins and the larger occurrences are called lodes. Examples: tin, copper, zinc, lead, etc.
- In **sedimentary rocks** – In these rocks, minerals occur in beds or layers. Coal, iron ore, gypsum, potash salt and sodium salt are the minerals found in sedimentary rocks .
- By **decomposition of surface rocks** – Decomposition of surface rocks and removal of soluble constituents leaves a residual mass of weathered material which contains ores . Example: bauxite.
- As **alluvial deposits** – These minerals are found in sands of valley floors and the base of hills. These deposits are called placer deposits. Examples; gold, silver, tin, platinum, etc.
- In **ocean water** – common salt, magnesium and bromine mainly derived from ocean waters.

TYPES OF MINERALS

- **Types of Minerals** : Metallic and non-metallic.
- **Metallic Minerals** : Further sub-divided into ferrous and non-ferrous.
- Ferrous (containing iron) are iron ore, manganese ore, chromite, pyrite, nickel and cobalt.
- Non-ferrous (containing metals other than iron) – gold, silver, copper, lead, bauxite, tin and magnesium.
- **Non-metallic Minerals** : They are limestone, nitrate, potash, mica, gypsum, coal, petroleum, etc.
- **Iron ore** : Basic mineral, the backbone of industrial development. There are four varieties of iron ore :
- **Magnetite** : contains 70% iron, finest quality, with magnetic properties.
- **Hematite** : contains 60% to 70% iron, most important industrial iron ore.
- **Limonite** : contains 40% to 60% iron.
- **Siderite** : contains 40% to 50% iron

DISTRIBUTION OF MINERALS IN INDIA :

India is sufficiently rich in mineral resources. The distribution of minerals in India is uneven.

- Broadly speaking peninsular rocks contain most of the reserves of coal, metallic minerals, mica and many other non-metallic minerals.
- Sedimentary rocks on the Western and eastern flanks of the peninsula, in Gujarat and Assam have most of the petroleum deposits.
- Rajasthan with rock systems of the peninsula has reserves of many non-ferrous minerals.

- The vast alluvial plains of North India are almost devoid of economic minerals.
- India is poor in non-ferrous minerals like zinc, lead, copper and gold. It is also poor in oil and natural gas. India has to import these minerals to meet its requirement.

CONSERVATION OF MINERALS :

Mini Steel Plants are using scrap iron all over the world, which is the best examples of **recycling**. It helps reduce wastes, but efficient recycling technologies have yet to be developed. Recycling is very expensive. Problems also arise on account of mixing together of various types of minerals, otherwise products made from iron, copper, lead, zinc and almost all types of minerals can be recycled for more.

CONVENTIONAL SOURCES OF ENERGY

➤ Energy : The Source of Water

- The chief sources of power are energy from fossil fuels, such as coal, petrol, gas, nuclear materials, falling water, sun, wind, etc. Wind, sun rays and falling water are converted into electricity while others like coal, petroleum and natural gas- are applied directly in motor vehicles and machines. Fossil fuels require combustion, they produce many gases and wastes causing damage to the environment. $\frac{2}{5}$ th of the global energy consumption comes from burning oil and the rest from burning coal and natural gas.

➤ Electricity

Electricity is obtained in three ways which are termed as hydro-electricity, thermal electricity and nuclear electricity.

➤ Coal : In India coal is the most abundantly available fossil fuel.

In India coal occurs in rock series of two main geological ages, namely :

- (i) Gondwana coal or metallurgical coal located in Damodar Valley.
- (ii) Tertiary coal deposits occurring in the North-Eastern states of Meghalaya, Assam, Arunachal Pradesh and Nagaland.

According to degrees of compression and the depth and times of burial, there are four types of coal.

- (i) **Anthracite** : Highest quality hard coal.
- (ii) **Bituminous** : Most popular coal in commercial use.
- (iii) **Lignite** : A low grade 'brown' coal, which is soft with high moisture content.
- (iv) **Peat** : Decaying plants in swamps produces peat. It has low carbon, low heating capacity with huge moisture content.

➤ PETROLEUM :

Liquid fossil fuel, wells are dug or drilled on land or offshore to bring oil to the surface. This crude oil is transported to refineries where it is changed into gasoline and petrochemicals. Petroleum refineries serve as 'nodal industries' for chemical, fertilizer and synthetic textile industries as various products are obtained during refining petroleum. It provides fuel for heating, lighting, running machineries and vehicles, lubricants and raw materials for some manufacturing plastics, chemicals, etc.

➤ NATURAL GAS :

A clean energy resource associated with petroleum can be extracted easily by drilling wells. Does not require processing, does not emit CO₂ and burns hotter and clearer, is cheaper and can be used to generate electricity, but it is limited. Used as a source of energy as well as an industrial raw material in the petrochemical industry.

➤ Following are the six main non-conventional sources of energy, namely : solar energy, wind energy, biomass energy, geothermal energy, tidal energy and hydro power.

➤ NON -CONVENTIONAL SOURCES OF ENERGY :

Following are the six main non-conventional sources of energy, namely : solar energy, wind energy, biomass energy, geothermal energy, tidal energy and hydro power.

- **CONSERVATION OF ENERGY RESOURCES :**
 - Energy is the basic requirement for economic development. Every sector of the economy needs energy for its development.
 - Most of the energy resources are limited.
 - Due to industrialization, modernization and urbanization the consumption of energy in all forms has been steadily rising all over the country.
- **How can we conserve energy resources ?**
 - Need to **develop a sustainable path** of energy development, *i.e.*, energy development but not at the cost of environment or needs of future generation.
 - **Judicious use** of limited energy resources.
 - Wastage of minerals should be minimized.
 - **Modern technology** should be used for the exploitation of energy resources.
 - Export of energy resources should be minimized.
 - **Use of substitutes** in order to save energy resources.
 - Encourage **recycling** of energy resources.

CHAPTER 6 : Manufacturing Industries

MANUFACTURING INDUSTRIES – INTRODUCTION, LOCATION AND CLASSIFICATION

- The process of using raw material to produce more valuable goods in large quantities is called **manufacturing**. Industries that manufacture finished products from primary material are called **manufacturing industries** in the secondary sector.
- **Importance of Manufacturing Industries :** Manufacturing industries play a crucial role in the overall, and especially the economic development of a country. A country's economic strength is measured by the growth of its manufacturing industries. Industrial development helps in eradication of unemployment and poverty.
- **Contribution of Industry to National Economy :** India is traditionally an agricultural country. The growth in manufacturing industries has modernised farming, and has generated a large number of employment opportunities. This has reduced the dependence of people on agriculture, allowed us to export our goods to other countries and build up our reserves of foreign exchange and hence led to overall growth and prosperity. Agriculture and industry mutually benefit each other.
- **The National Manufacturing Competitiveness Council (NMCC)** has been set with the objectives of improving productivity through proper policy interventions by the government and renewed efforts by the industry.

Factors Affecting the Location of Industries :

- The key factor influencing all decisions about setting up a manufacturing industry, including its location, is the cost. The main costs in a manufacturing industry are for procuring raw material, producing goods and distributing finished goods in the market.
- The ideal location for a factory will be a place that has easy and low-cost availability of raw material, capital, land, labour, power, transport, and market.
- A manufacturing industry promotes the urbanisation of its neighbourhood. Already urbanised areas also attract industries, since they provide ready facilities for transport, banking, labour, consultancy, etc. If an urban centre offers sufficient facilities and advantages, several industries come up there together to form an **industrial agglomeration**. These industries together form an agglomeration economy.

- Before independence, most industries in India were located in port cities to enable easy overseas trade. Manufacturing industries are classified based on their source of raw material, role, capital investment, ownership pattern, and bulk of supplies like raw material and finished products.
- **Classification of Industries :**
Industries can be classified into several groups. A brief account is given below:
- **On the basis of source of raw materials used :**
 - Agro based industries
 - Mineral based industries
- **On the basis of the main role :**
 - Basic or key industries
 - Consumer industries
- **On the basis of capital investment :**
 - Large scale industries
 - Small scale industries.
- **On the basis of ownership :**
 - Private sector industries
 - Public sector industries
 - Joint sector industries
 - Cooperative sector industries
- **On the basis of bulk and weight of raw materials and finished goods :**
 - Heavy industries such as iron and steel industry.
 - Light industries such as electrical industry.

AGRO BASED INDUSTRIES & MINERAL BASED INDUSTRIES

- Industries based on agricultural raw materials are called agro-based industries. For example, cotton textiles, jute textiles, silk, textiles, synthetic textiles and sugar industry
- Manufacturing industries that use minerals as raw materials are called mineral-based industries. The iron and steel industry is the basic industry on which all other industries depend. The production and per capita consumption of steel is a measure of a country's economic development.
- The main raw materials used in the iron and steel industry are iron ore, coal and limestone. The raw materials and finished products of iron and steel industries are quite bulky, these industries must be located near the mining areas of the required minerals and must be connected by a good transport network.
- **Aluminum Smelting** is the second most important metallurgical industry in India. It is used to manufacture aircraft, utensils and wires. Bauxite is the raw material used in the smelters.
- **Aluminum Smelting** has gained popularity as a substitute for steel, copper, zinc and lead in a number of industries.
- **Chemical Industries:** The Chemical industry comprises both large and small scale manufacturing units. Rapid growth has been recorded in both inorganic and organic sectors.

INFORMATION TECHNOLOGY AND ELECTRONICS INDUSTRY

- The electronics industry covers a wide range of products from transistor sets to television, telephones, cellular telecom, telephone exchange, radars, computers and many other equipment required by the telecommunication industry.

INDUSTRIAL POLLUTION AND ENVIRONMENTAL DEGRADATION

- Industries have caused severe pollution to our natural resources. Industries cause environmental degradation through four main types of pollution i.e. air pollution, water pollution, land pollution or soil degradation and noise pollution.

- Smoke contains undesirable gases like carbon dioxide, sulphur dioxide and carbon monoxide, besides solid and liquid particulate matter, in the form of dust and spray mist, which cause air pollution. Air pollution affects the health of humans, animals and plants alike and also causes damage to buildings.
- Water pollution is caused by the discharge of untreated chemical waste like dyes, detergents, acids, heavy metals like lead and mercury, pesticides, fertilisers, and plastics from industries, into fresh water bodies like rivers and lakes. Solid wastes like fly ash, phosphogypsum, and iron and steel slag also cause water pollution.
- Loud noise can lead to irritation, loss of hearing, and an increase in blood pressure and heart beat rate. Industrial machinery, construction activities, generators, and equipment like saws and pneumatic drills are mainly responsible for noise pollution. One of the most important steps for the control of environmental degradation is treating hot and polluted wastewater from industries before releasing it into rivers and lakes.
- **Wastewater treatment involves :**
 - Primary treatment through screening, grinding, flocculation and sedimentation.
 - Secondary treatment through bacterial action to digest harmful chemicals.
 - Tertiary stage of stirring with chemicals to neutralise remaining harmful waste.
- Treated wastewater can be recycled for re-use in industrial processes. Rainwater harvesting can be used to meet the requirements of water for industrial processes.
- **National Thermal Power Corporation** or NTPC is a major electricity generation and distribution company in India. NTPC has demonstrated how conservation of environment and natural resources can happen simultaneously with industrial growth by :
 - Adopting latest technical know-how
 - Minimising waste
 - Providing green cover
 - Reducing environmental pollution
 - Continuous ecological monitoring.

CHAPTER 7 : Lifelines of National Economy

MEANS OF TRANSPORT

- Transport is a key factor that influences India's rapid economic development. Based on the medium it uses, the means of transport can be divided into land transport, water transport and air transport.
- Land transport includes roadways and railways and pipelines used to transport liquid and gaseous material over long distances.
- Water transport can be classified as inland transport and overseas transport. Inland transport happens along coastline between two domestic ports or through inland waterways. Overseas transport involves sending goods from one country to another. Air transport can be classified as domestic and international. Private and government-run domestic airways connect different cities of India. International airways connect India with destinations in all parts of the world.
- Trade requires some means of exchanging ideas and connecting with people. This is where communication comes in.
- There are five types of **transport systems in India** – roadways, railways, pipelines, waterways and airways.

- **ROADWAYS** : A number of roads were built during the Mughal rule. Sher Shah Suri built the Grand Trunk Road from Chittagong (now in Bangladesh) in the East to Peshawar (now in Pakistan) in the West.
- **RAILWAYS** : The total length of railways is about 64,460 km. It had a fleet of 9,213 locomotives, 53,220 passenger service vehicles, 6,493 other coach vehicles and 2,29,381 wagons as on March 2011.
- **PIPELINES** were earlier used for the transportation of water and now they are being used for the transportation of crude oil, petroleum products and natural gas.
- **INLAND WATERWAYS** have a length of 14,500 km. The Government has declared the following waterways as National Waterways :
 - (i) The Ganga river between Allahabad and Haldia (1,620 km). – National Waterway No. 1.
 - (ii) The Brahmaputra between Sadiya and Dhubri (891 km). – National Waterway No. 2.
- **AIRWAYS** are the fastest mode of transport but they are costly as well. In 1953, air transport was nationalised.

MEANS OF COMMUNICATION

- Communication is of two types; **personal communication** and **mass communication**. Personal communication is where just two or a small group of people communicate with each other. Personal letters, e-mails and phone calls are examples of inter-personal communication.
- Mass communication is communication referred to an indefinite number of people spread over a large geographical area. Radio, television, cinema, newspapers, magazines and internet are examples of mass communication.
- India's postal service is the largest of its kind in the world where the services are provided by the Department of Posts of the Government of India.
- The Indian postal service has introduced six channels for quicker delivery of letters in large town and cities, called the Rajdhani Channel, Metro Channel, Green Channel, Business Channel, Bulk Mail Channel and Periodical Channel.
- The telecom network in India is the largest in Asia. All the urban centres and over two-thirds of Indian villages are now connected with **Subscriber Trunk Dialling** or STD telephone facility.
- The Government of India has made provisions for 24-hour STD facility in every village of India. A uniform rate of STD calls from anywhere in India is possible due to the integration of our space and communication technology development programmes.
- Radio, television, cinema, books, newspapers, magazines and internet serve the dual purpose of providing entertainment and information to the masses. The national radio broadcaster is **Akashwani** or **All India Radio**.
- Akashwani broadcasts a variety of programmes in regional languages all over India. The national television broadcaster **Doordarshan** is one of the largest networks in the world. Doordarshan broadcasts a variety of entertainment, news and information, sports and educational programmes for all age groups.
- Daily newspapers in India are published in more than 100 languages and local dialects. Hindi has the largest share of newspaper publication, followed by English and Urdu.
- The Indian film industry is the largest producer of feature films in the world and also produces short films and video films.
- The Central Board of Film Certification, more commonly known as the Censor Board, certifies all Indian and foreign films before they can be released in India.

INTERNATIONAL TRADE AND TOURISM

- The exchange of goods between people, companies, states or countries is called trade. The trade within a locality or between towns or villages of a state is called local trade. The trade between two states is called state-level trade. The trade between two countries is called **international trade**.
- International trade is the measure of the health of a country's economy and has two components. The goods purchased from other countries are called imports while the goods sold to other countries are called exports. The difference between the exports and imports of a country is called its **balance of trade**.
- When the value of the exports of a country is more than the value of its imports, the country is said to have a favourable balance of trade. When the value of the imports of a country is more than the value of its exports, the country is said to have an unfavourable balance of trade.
- The bulk imports as a group accounts for around 39% of the total imports by India and includes fertilisers, cereals, edible oils and newsprint. India is a leading software producing country and generates large amounts of foreign exchange through the export of information technology.
- **Tourism** is an important form of international trade. The Indian tourism industry employs around 15 million people to take care of around 2.6 million foreign tourists who visit India every year. Foreign tourists visit India for heritage tourism, eco-tourism, adventure tourism, cultural tourism, medical tourism and business tourism.
- Tourism not only promotes national integration, it also gives tremendous boost to local handicraft industries and helps foreign tourists to understand and appreciate our cultural heritage.
- Foreign tourists' arrivals in the country witnessed an increase of 4.5% during the year 2015 as against the year 2014, thus contributing ₹ 1,35,193 crore of foreign exchange in 2015.