9th Social Science Lesson 12 Notes in English

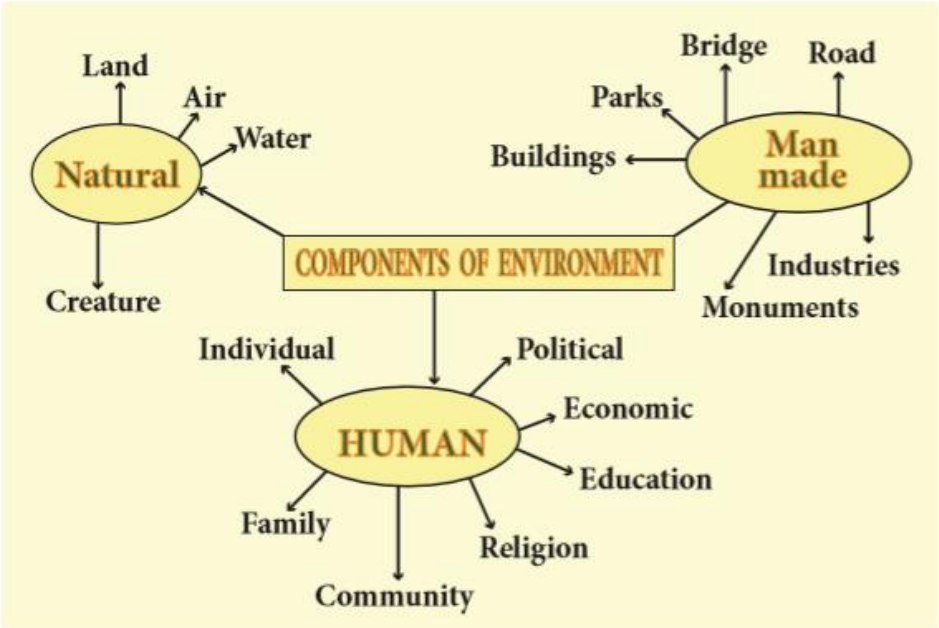
12. Man and Environment

- Environment is a set of relationships between man and nature.
- Man has survived through the **ages, dwelling within his surrounding** called the environment.
- The word **'environment'** is derived from **the French word 'environ' meaning encircled or surrounded**.
- Environment includes both living (biotic) and non living (abiotic) components.

Man and Environment:

- Early man depended entirely on nature for food, clothing and shelter. Man has enjoyed a dominant position over the other living organisms around him because of his **erect posture, hands and intelligence.**
- From the **paleolithic period to the neolithic period**, man has invented and developed the wheel, fire, tools and patterns of agriculture and housing to his comfort, which led him to improve the standard of living making himself technologically advanced.
- Thus, modern man modified the environment where he multiplied in numbers to increase population and has always).
- Economic Factors E**ducational institutions, employment opportunities, manufacturing industries, luxurious amenities, trade and commerce and other facilities encourage dense population** in an areas extended his territories, leading to the exploitation of natural resources.

Classification of Environment:



Environment is generally classified as

(a) Natural environment

(b) Human environment and

(c) Manmade environment

Natural environment

Earlier, we have learnt about the natural components of environment such as lithosphere, atmosphere, hydrosphere and biosphere.

Human Environment

Human environment is defined as the interaction between man as an individual, with his family, occupation and society. It is also related to various cultural aspects such as education, religion, economics and politics.

Man-made environment

- Man-made environment has been created by man himself for the purpose of fulfilling his needs and to make his life more convenient and easy.
- For example, **building, transport, park, industrie, monument, etc.**
- To bring an equilibrium between man and the environment, man has to study the distribution of population, availability of resources, development in technology, alternate means of fulfilling the increasing demand created by the growing population and other man-made features.

Population

- Human beings are important to develop the economy and society. The Latin word **'populus' means 'people'**.
- Population is the total number of people living together in a particular place at the given point of time.
- Population Growth **'It is easy to add but difficult to maintain'** Population is a dynamic phenomenon where the number, distribution and composition are constantly changing.
- Human population increases as babies are born and decreases as people die.
- For most of human history, births have only slightly exceeded deaths every year. As a result, human population grows slowly.
- About the time of Industrial Revolution, it began to increase rapidly. Natural increase of population is the difference between the birth rate and death rate.
- In fact population is always increasing but only in very rare cases it may decrease through natural or man-made disasters such **as famine, landslides, earthquakes, tsunami, epidemics, extreme weather conditions and war**.

- Population change refers to an increase or decrease in the population of an area influenced by the number of births, deaths and migration.
- The population of the world doubled from **500 million in 1650 to 1000 million in1850**.
- The projected population for **2025 and 2050 is about 8 billion and 9 billion** respectively. Population growth refers to an increase in the number of people who reside in a particular area during a particular period.
- Population increases when there are more births and immigration. It decreases when there are more deaths and emigration. Population growth, can be calculated as

Population growth = (Birth rate + Immigration) - (Death rate + Emigration).

The important features associated with the population studies in Tamil Nadu are as follows:

S. No	Term	Definition	Data for Tamil Nadu
1	Birth Rate	Indicates the number of live births per 1000 people in a year	15.4% (2014)
2	Population Growth	The average annual growth of population	15.6% (2011)
3	Population Density	The average number of people per square kilometre	555/ Km^2 (2011)
4	Total Fertility Rate	The average number of children born per woman during her child bearing years (usually ages 15 to 44)	1.6 Birth Per Woman (2016)
5	Infant Mortality	The number of deaths under one year of age for every 1000 live births in a year	17 per 1000 live births (2016)
6	Life Expectancy at Birth	The average number of years an individual is expected to live	70.6 years (2010-14)
7	Literacy Rate	The percentage of people in a given population who can read and write a language	80.09% (2011)
8	Sex Ratio	The number of females for 1000 males in a given population	996:1000 (2011)

Distribution of Population

Population distribution refers to the way in which people are spread out across the earth's surface. The world population is not uniformly distributed, owing to the following factors.

Physical Factors

Physical factors include temperature, rainfall, soil, relief, water, natural vegetation, distribution of minerals and availability of energy resources.

Historical Factors

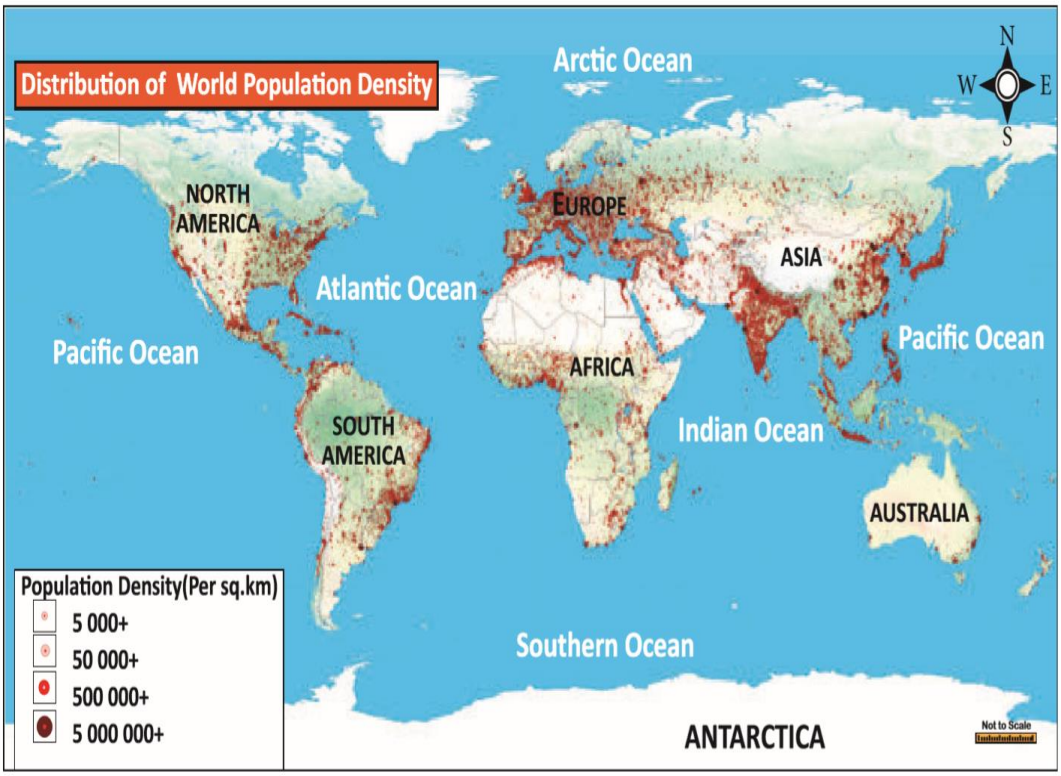
Regions with historical importance (river valley civilizations), war and constant invasions fall under historical factors responsible for population distribution.

Economic Factors

Educational institutions, employment opportunities, manufacturing industries, luxurious amenities, trade and commerce and other facilities encourage dense population in an area.

Density of population

- Density of population refers to the number of people living per square kilometre.
- An area is said to be sparsely populated when it has a large area with less number of people.
- Similarly, smaller the area with a large number of people, it is said to be densely populated.
- Population Density = Total Population/Total land area



The world's population density is divided into three main groups.

- Areas of high density **(above 50 people per sq.km)** - East Asia, South Asia, North West Europe & Eastern North America
- Areas of moderate density **(10 to 50 people per sq.km)** - The sub tropical regions like Angola, Congo, Nigeria and Zambia in Africa
- Areas of low density **(less than 10 people per sq.km)** - Central Africa, Western Australia, Northern Russia, Canada, etc…

Migration

- Migration is defined as the **permanent or semi-permanent** change of home of an individual or a group of people over a significant distance from their place of origin.
- The causes of migration may be physical **(climate, drought, flood, earthquake, volcanic eruption, epidemics etc.),** social inequalities, economic opportunities, technology, education, cultural clashes, war or political issues. There are two types of migration:

Internal Migration

The movement of people within a country i.e. **between states, districts, villages, etc** is called as Internal migration.

International Migration

The movement of people from one country to another, across international borders is called as International migration.

Push and pull factors of migration

Push factors are those factors which force people to move to new areas to live, while pull factors are those factors that attract migrants to a new location. Given below are some of the push and pull factors of migration.

Push Factors of migration	Pull factors of migration
• Insufficient jobs and few opportunities	• Better job opportunities
• Primitive conditions	• Better living conditions
• Desertification	• Fertile land
• Slavery or forced labour	• Socio economic independence
• Poor medical care	• Better health care
• Death threats	• Security
• Pollution	• Clean environment
• Poor infrastructural facilities	• Better infrastructural facilities
• Bullying	• Education
• Natural Disasters	• Living Stability
• War	• Industry
• Lack of political or religious freedom	• Political and religious freedom

Human settlements

- A settlement can be described as any temporary or permanent unit area where people live, work and lead an organized life. It may be a **city, town, village or other agglomeration** of buildings.
- During the early days, man preferred tree branches, caves, pits or even rock cuts as his shelter.
- As days passed by, man slowly learnt the art of domesticating animals and cultivating food crops.
- The evolution of farming took place along four major river basins i.e. **the Nile, Indus, Hwang Ho, Euphrates - Tigris**.
- Man built huts and mud houses. Slowly settlements came into existence. A settlement generally consisted of a cluster of houses, places of worship and a place of burial. Later, small settlements developed into villages.
- Several villages together formed a town. Bigger towns developed into cities. Settlements were formed in different shapes, sizes and locations.

Classification of settlements

On the basis of occupation, settlements may be classified as rural and urban settlements.

Rural Settlements

- Any settlement where most of the people are engaged in primary activities like agriculture, forestry, mining and fishery is known as a rural settlement.
- Most of the world's settlements are rural, that are mostly stable and permanent.

- The most important and unique feature of rural settlements is the vast, open spaces with green, pollution-free environment.

Patterns of rural settlements:

Rectangular pattern:

Rectangular pattern of settlements are found in plain areas or valleys. The roads are rectangular and cut each other at right angles.

Linear pattern:

In a linear pattern, the houses are located along a **road, railway line and along the edge of the river valley or along a levee.**

Circular or semicircular pattern:

The pattern of settlement that is found around the **lakes, ponds and sea coasts** are called circular or semi circular pattern.

Star like pattern:

Where several **metalled or unmetalled** roads converge, star shaped settlements develop. In the star shaped settlements, houses are spread out along the sides of roads in all directions.

Triangular pattern:

Triangular patterns of rural settlement generally develop at the confluence of rivers.

T-Shaped, Y-Shaped, Cross-Shaped or Cruciform settlements:

T-shaped settlements develop at tri junctions of the roads (T), while Y-shaped settlements emerge as the places where **two roads converge with the third one.** Cruciform settlements develop on the cross-roads which extend in all four directions.

Nebular pattern:

The arrangement of roads is almost circular which ends at the central location or nucleus of the settlement around the house of the **main landlord of the village or around a mosque, temple or church.**

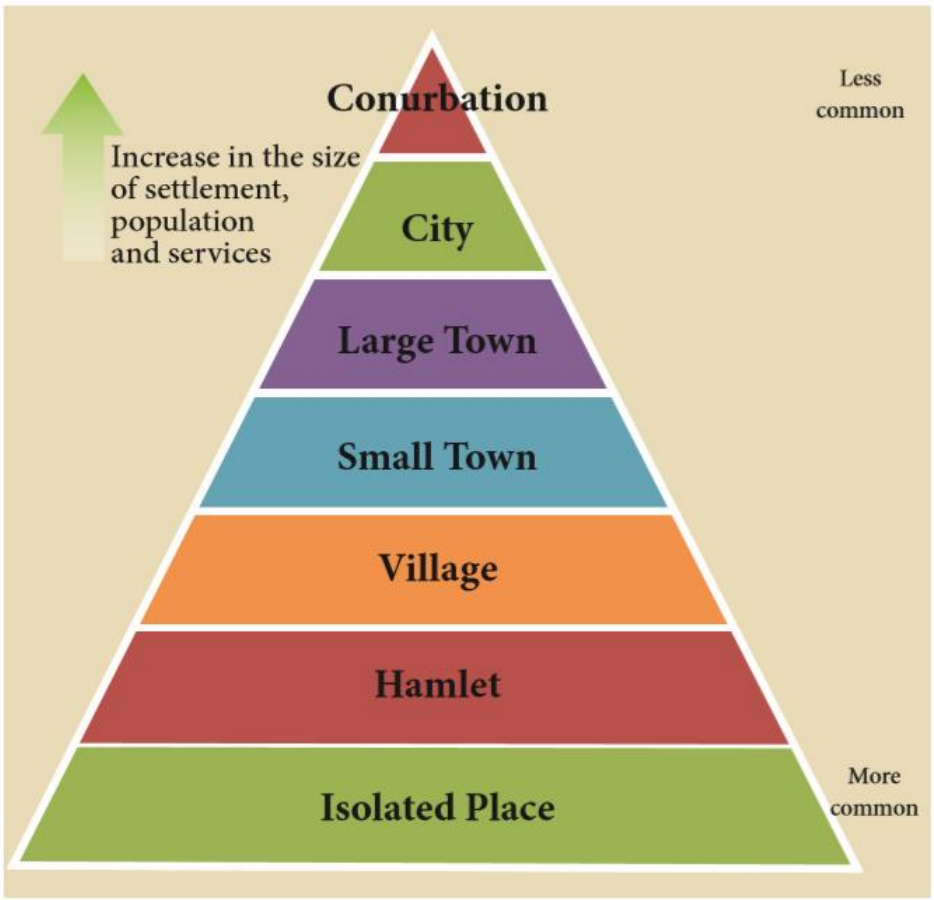
Urban Settlements

- Urban is the term related to cities and towns where people are primarily engaged in non-agricultural activities, such as secondary, tertiary and quaternary activities.

- The common characteristic feature of an urban unit is that they are **compact, congested and liable to a large number of population.**
- They comprise of mostly man-made structures that fulfill the requirements of a **society's administrative, cultural, residential and religious functions.**
- The factors responsible for urbanization are **better employment opportunities, suitable conditions for business, education, transport, etc.**

Classification of Urban Settlements

Urban centres are classified as towns, cites, metropolitan cities, mega cities, conurbation, etc., depending on the size and services available and functions rendered to it.



Town:

A town is generally larger than a village, but smaller than a city. It has a population of less than 1 lakh. E.g.: Arakkonam near Chennai

City:

Cities are much larger than towns and have a greater number of economic functions. The population in cities is estimated to be more than 1 lakh. E.g.: Coimbatore

Metropolitan cities:

Cities accommodating population between 10 lakhs and 50 lakhs are metropolitan cities. E.g.: Madurai

Megacities:

Cities with more than 50 lakh population are called Megacities. E.g.: Greater Chennai

Conurbation:

A conurbation is a region comprising of a number of cities, large towns and other urban areas. E.g.: Delhi conurbation

Economic Activities

Economic activities are those efforts or actions that involve production, distribution and consumption of commodities and services at all levels within a region.

Types of Economic Activities

Primary Activities:

Primary Activities pertain to the extraction of raw materials from the earth's surface. For example: **food gathering, hunting, lumbering, fishing, cattle rearing, mining and agriculture.**

Secondary Activities:

Secondary Activities transform raw materials into finished goods. For example: **Iron and Steel industries, automobile manufacturing etc.**

Tertiary Activities:

Activities which by themselves do not produce goods, but support the process of production are called tertiary activities. For example: **Transport, communication, banking, storage and trade.**

Quaternary Activities:

The activities related to Research and Development, as well as knowledge are called Quaternary activities. For e.g. **Services like consultation, education and banking**

Quinary Activities:

The activities that focus on the creation, rearrangement and interpretation of new and existing ideas are called quinary activities. It includes the highest levels of decision making in a society or economy. E.g.: **Senior business executives, scientists and policy makers in the Government.**

Environmental Issues

- Environment is the basic life support system that provides **air, water, food and land to all living organisms.**
- But human beings degrade the environment through rapid industrialization. Human life will be at risk if they don't live in harmony with the environment.
- Environmental problems are not limited to the local, regional and national level, but there are several global issues.
- Scientific and technological revolutions have given a lot of facilities to mankind, but at the same time it is responsible for the depletion of resources.
- Thus, several environmental problems have emerged. Some of the environmental issues that we are going to learn are:
    1. Deforestation
    2. Pollution such as air, water ,noise, etc
    3. Urbanisation
    4. Fracking
    5. Waste disposal

Deforestation

Deforestation is the cutting down of trees permanently by the people to clear forests in order to make the land available for other uses.

Effects of Deforestation:

- Deforestation results in many effects like **floods and droughts, loss of soil fertility, air pollution, extinction of species, global warming, spread of deserts, depletion of water resource, melting of ice caps and glaciers, rise in sea level and depletion of ozone layer.**
- The United Nations Conference on Environment and Development (UNCED) by name Earth Summit Conference held at **Rio de Janeiro, Brazil, on June 1992** concluded that all member countries should reduce their emission of carbon dioxide, methane and other green house gases thought to be responsible for global warming.

Conservation of forests

Conservation of forests can be done through the regulation of cutting of trees.

Control over forest fire: Through regular monitoring and controlling the movement of the people forest fire can be prevented.

Reforestation and afforestation: Reforestation involves the replanting or regeneration of areas of forest which have previously been damaged or destroyed. Sometimes forests are able to regenerate naturally. Afforestation is the process of planting trees or sowing seeds on barren land devoid of any trees to create a forest. The term afforestation should not be confused with reforestation, which is the process of specifically planting native trees into a forest that has decreasing number of trees. **While reforestation is increasing the number of trees of an existing forest, afforestation is the creation of a new forest**.

Proper use of forest products: We depend on forests for our survival from the air we breathe, to the wood we use. Besides providing habitats for animals and livelihoods for humans, forest products are one of the most essential things in our day to day life. Therefore we must use forest products properly.

Sustainable forest management: The use of forest and forest lands in a way and at a rate, that **maintains their biodiversity, productivity, regeneration capacity, vitality** and their potential to fulfill the global levels should not cause damage to other eco systems. Forest Management seeks to achieve a balance between the society's increasing demands for forest products, its benefits and the preservation of forest health and diversity too. This balance is critical to the survival of forests and to the prosperity of forest dependent communities.

Pollution

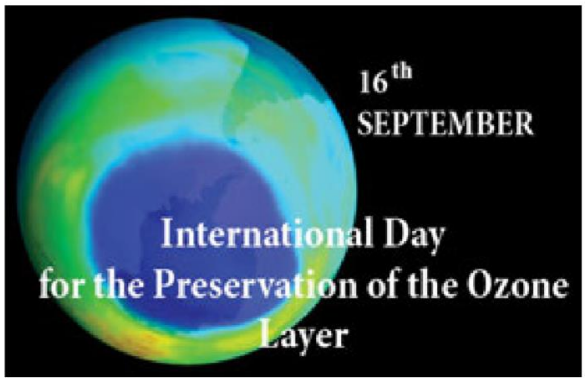
- Environmental pollution occurs when pollutants contaminate the natural surroundings.
- Pollution disturbs the balance of our eco system affecting our normal life styles and gives rise to human illnesses and global warming. The word **'pollute'** means to degrade or to make dirty.
- Pollution is thus, an unfavourable modification of the natural world, caused entirely or partly due to direct or indirect actions of human beings.
- There are many types of pollution degrading the environment. They are
    1. Air pollution
    2. Water pollution
    3. Land pollution
    4. Noise pollution
    5. Light pollution

Air pollution

- Due to some human activities or natural processes, the amount of solid wastes or concentration of gases, other than oxygen increases in air. Air thus becomes polluted and this process is called air pollution.

- The pollutants are generally grouped as natural and manmade. The natural pollutants are **volcanic eruptions, wind erosion, pollen disposal, evaporation of organic compounds and radioactive elements etc**.,
- Natural air pollution does not occur in abundance and also creates a little impact on the environment. But, manmade pollutants like **vehicular emission, industrial wastes, smoke** from thermal power plants and refineries badly affect the environment.
- The main pathological effects caused by **air pollutants, particularly oxides of sulphur, nitrogen and carbon-dioxide, include respiratory disorders, jaundice, irritation of eyes and throat, headache, cancer and even death**.

Ozone Depletion



- Ozone layer is depleted by the pollutants like CFCs, HFCs, methyle bromite, etc.
- to the depletion of ozone layer, UV rays fall on the earth's surface, warming the earth surface and leads to impervious diseases like **skin cancer, blindness, loss of plankton etc.,**

Water Pollution

- Water pollution is any chemical, physical or biological change in the quality of water that has a harmful effect on any living thing that drinks or uses or lives in it.
- The water bodies including ponds, lakes, rivers, ground water and oceans are contaminated by the chemical wastes from industries, domestic wastes and sewage etc.

Major water pollutants

The disease – Causing agents bacteria, viruses, protozoa and parasitic worms that enter sewage – systems and untreated waste.

Oxygen demanding bacteria: Wastes that can be decomposed by oxygen requiring bacteria

Water soluble inorganic pollutants: Acids, Salt and toxic metals.

Organic compounds: Oil, plastics and pesticides in the water.

Causes of Water Pollution

Main pathological problems caused due to water pollution include diarrhoea, liver cirrhosis, lung cancer, kidney diseases, paralysis, chronic pain, bone deformities, cancer and even death and so on.

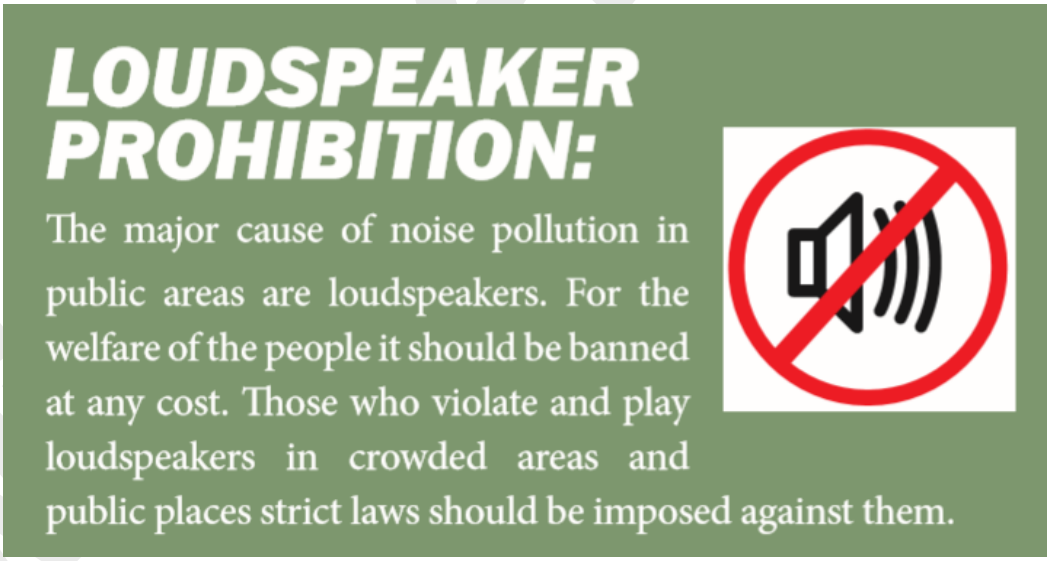
Land Pollution

- Land pollution is contaminating the land surface of the earth through dumping of urban waste matter.
- It arises from the breakage of underground storage tanks, application of pesticides and percolation of contaminated surface water, oil and fuel dumping, leaching of wastes from landfills or direct discharge of industrial wastes to the soil.

Preventive Measures

- Things used for domestic purposes can be reused and recycled.
- Organic waste matter should be disposed off far away from the settlements.
- Inorganic wastes can be separated, reclaimed and recycled.

Noise Pollution



- Noise pollution is basically a problem of urban areas, industrial areas, transport areas due to bombardment, traffic etc.
- It has an impact on the habitat of animals migration and health of inhabitants.
- E.g. Chandipur Missile Launching Centre has created migration of sea birds.
- **Hearing loss, hypertension, stress and mental illness** are the major health hazards that human beings face.

The control measures of noise pollution

- Development of green belt vegetation
- Installation of decibel meters along highways and in places of public gatherings
- Planting trees along the compound wall to protect houses.

Light pollution

- Light pollution is an unwanted consequence of outdoor lighting and includes such effects as sky glow, light trespass and glare.
- It is caused by **streetlights, parking lot lights, floodlights, signs, sports field lighting decorative and landscape lights**.
- It affects the environment, energy resources, wildlife, humans and astronomy research.

Urbanisation

Urbanisation refers to the process of increase in urban population and urban areas in a country.

Problems of urbanisation

- As the town expands, it mounts more pressure on transport system, water supplies, sewage and profuse disposal.
- The overall development creates problems like air pollution, water pollution, traffic congestion and noise pollution etc.,
- This disturbed environment affects the human beings as mental illness, heart troubles, breathing problems etc.

Fracking

- The modern technology applied to extract oil and gas while fracturing the rocks artificially with the use of pressurized liquid is called fracking.
- Fracking fluid is a mixture of water, sand and thickening agents. The first successful implementation of the process was done in **1950**.
- Methane is one of the most important chemicals used in fracking process. It is estimated that four percent of methane escapes into the atmosphere during extraction.
- Methane is **25 times stronger** than carbon dioxide in terms of trapping heat.
- The spills of this gas is detrimental to the air quality of the surrounding fracking sites.
- Pollutants decrease the availability of clean air for workers and local residents.

Other Environmental Concerns

- Fracking not only pollutes water and air but also pollutes the soil. The oil spills during fracking can harm the soil and the surrounding vegetation.
- The use of high pressure at the time of oil extraction and the storage of waste water on site may cause earthquakes.

Waste disposal

Things become waste when their purpose of consumption is over. Wastes can be classified into five types, which are commonly found around the house. These include **liquid waste, solid rubbish, organic waste, recyclable rubbish and hazardous waste like e-waste.**

How to dispose of waste:

- Do not litter your surroundings. Use a proper waste bin to store your wastes.
- People should practise to segregate degradable and non-degradable wastes and should dispose them in proper coloured bins.
- Wastage is generally classified into three types. They are

Wet Waste: which comes from the kitchen/ cooking/food, etc.

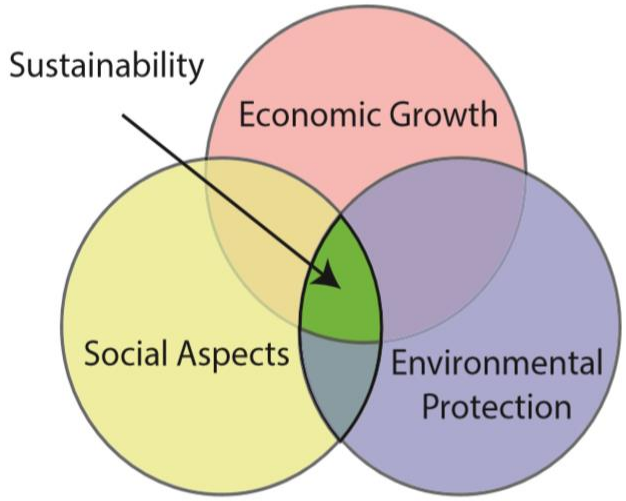
Dry Recyclable Waste: such as newspapers, cardboard, packing plastics, bottles, cans, etc., should go to a different bin.

Rejected Waste: which does not belong to the above two categories, including bio waste like diapers and bandages, etc..

Sewage sludge is produced by waste water treatment processes. Due to rapid urbanization, there has been an increase in municipal waste water. Common disposal practices of sewage should be send to sewage treatment plant through proper drainage pipes.

Electronic Waste (e-waste): It can be defined as any electrical goods, devices or components that you no longer want or have already thrown away. For example, computers, televisions, mobiles and fax machines. This waste can take many years to break down, if at all and can contain toxic chemicals such as mercury, lead and lithium that leach into the ground and cause illness. Even short term exposure to high levels of lead can result in vomiting and diarrhea. Instead of sending e-waste to the dump, components from electronics can be reused to make new products.

Sustainable Development



- Humans on earth are facing many problems, such as pollution, climatic changes, poverty, war and uneven distribution of resources.
- These problems directly affect the survival of mankind. Therefore to sustain mankind, we have to educate people on what sustainable development is.
- In **1987, the Brundtland Commission** cited the definition of sustainability.
- **"Sustainable development is development that meets the needs of the present without compromising the ability of future generation to meet their own needs".**
- For sustainable development to be achieved, it is crucial to harmonize three core elements: economic growth, social aspects and environmental protection.
- These elements are interconnected and are crucial for the wellbeing of individuals and societies. To achieve true sustainability, we need to balance the economic, social and environmental factors of sustainability in equal harmony.

Social Sustainability

- The ability of a social system such as a country, family or organization to function at a defined level of social well being and harmony is called social sustainability.
- Problems like **war, endemic poverty, widespread injustice and low education rates** are symptoms of a system in socially unsustainable.
- The balancing capacity of a government in maintaining peaceful existence towards other countries and at the same time providing the requirements of its citizens without affecting the environment creates social sustainability.

Economic Sustainability

- The people on earth consume far more than what is their fair share.

- The economic sustainability is successfully implemented through strong **Public Distrubution System.**
- Economic sustainability ensures that our economic growth maintains a healthy balance with our ecosystem.

Environmental Sustainability

- Environmental sustainability is the ability of the environment to support a defined level of environmental quality and natural resource extraction rates forever to mankind.
- Unnecessary disturbances to the environment should be avoided whenever possible.

Why is sustainability important?

- The excessive usage of natural and manmade resources deplete its availability for the future generation.
- We need to look after our planet, our resources and our people to ensure that we can hand over our planet to our children to live in true sustainability.
- Hence conservation and awareness are the two important terms that can bring sustainability to our living.
- When we use the word sustainability to **mean maintain, it means to maintain it forever**
- This is because our actions have a lasting effect on the environment and we should protect it for our future generations.

More to Know:

1. Rural India has hardly any arrangement to dispose off liquid waste. Only **56.4%** of the urban wards have a sewer network. According to estimates, about **80%** of the sewage in India flows into rivers, lakes and ponds. This sewage is untreated and pollutes water bodies.

2. Our role in conserving water:

- Do not dump in or around rivers. Clean up rivers that have a lot of trash in and around them.
- Never dispose of cooking fats and oils by pouring them down the sink.
- In the bathroom, take short showers and draw less water for baths. When you buy a new toilet, purchase a low flow model **(1.6 gallons or less per flush**). Check your toilet for "silent" leaks by placing a little food coloring in the tank and see if it leaks into the bowl.
- Turn off water while brushing teeth, washing, gardening and shaving.
- Keep a gallon of drinking water in the refrigerator, rather than running the tap for cold water. Run your washing machine with a full load of clothes. Wash with warm water instead of hot water, rinse with cold water instead of warm water.

3. Ozone layer

- Ozone is a poisonous gas made up of molecules consisting of three **oxygen atoms (O3).**
- This gas is extremely rare in the atmosphere, representing just three out of every 10 million molecules.
- The ozone layer is not really a layer at all, but has become known as such because most ozone particles are scattered between **19 and 30 kilometre** up in the earth's atmosphere, in a region called the stratosphere.
- Ozone layer in the atmosphere absorbs most of the harmful ultraviolet radiation from the sun.

- It also screens out the deadly UV-C radiation the ozone shield is this essential to protect life.

4. Acid Rain

- When pollutants combine with water vapour in the presence of sunlight and oxygen, they form **dilute sulphuric and nitric acids** in the atmosphere.
- When this mixture precipitates from the atmosphere, it is called acid rain. The gases that cause acid rain are **sulphur-di-oxide, nitrogen oxides, carbondi-oxide and other minute bio-products,** caused by the burning of fossil fuels

5. Green house effect

- Global warming is caused by the increase of green house gases such as **carbondioxide, methane, water vapour and Chloro Fluoro Carbons(CFC), carbon monoxide, photo chemical oxidants and hydrocarbons,** which are responsible for the heat retention ability of the atmosphere.
- Global warming causes climatic change, ozone layer depletion, rise in sea level and drowning of coastal inhabited land, melting of ice, etc.,
- They are posing an even greater threat to human existence and so, man must start thinking of protecting the environment from pollution.

6. **Damascus** is widely believed to be the oldest, continuously inhabited city in the world, dating back to at least **11, 000 years.**

- Tokyo is the world's largest city with the greater Tokyo area, housing about 38 million inhabitants.
- According to the Quality of Living Rankings by Consultancy Mercer, in **2016, the city offering the best quality of life was Vienna, with Zurich falling second.** (Sources: United Nations, UNESCO, Mercer).

7. **Emigration** means moving out or to leave a place.

8. **Immigration** means to enter or come into a new country for the purpose of settling there.

9. 'India has an official population policy implemented in **1952**. India was the first country to announce such a policy. The main objective of this policy was to slow down the rate of population growth, through promotion of various birth control measures.

10. Census

- Census is an official enumeration of population carried out periodically. It records information about the characteristics of population such as **age, sex, literacy and occupation**.
- Different countries of the world conduct census every **5 to 10** years as recommended by the United Nations.

- The first known census was undertaken nearly six thousand years ago by the **Babylonians in 3800 BC (BCE)**. Denmark was the first country in the modern world to conduct a census.
- In India, the first census was carried out in the year **1872.**
- Censuses have been conducted regularly every tenth year since **1881**.
- The Indian Census is the most comprehensive source of demographic, social and economic data.

11. The World Population Day is observed on **11th July every year.** It seeks to raise awareness of global population issues. The United Nations Development Programme started celebrating this event from the year **1989.**

12. The black death is estimated to have killed **30 - 60 percent of Europe's total population during the 14th century.** The dominant explanation for black death is attributed to the outbreak of plague.

13. What is Demography?

In ancient **Greek, 'demos' means people and 'graphis' means study of measurement.** So, 'Demography' is the statistical study of human population.

14. The **Stockholm Conference, 1972,** declared man as both a creator and moulder of his environment. 'The Earth Summit', formally known as the United Nations Conference on Environment and Development (UNCED) was held in **Rio de Janeiro in 1992.**

15. Over population and Under Population

Over population is a condition when a country has more people than its resources to sustain. Under Population is a condition where there are too few people to develop the economic potential of a nation fully.

16. The Mangroves of Palk Bay towards Sustainable Development

- The connection between environment protection and restoration and sustainable development has also been presented.
- As an example, the case of the **Mangroves of Palk Bay will help demonstrate these concepts in more practical terms.**
- Palk Bay is the area located roughly between Kodiakkarai **or Point Calimere and Rameshwaram Island** in Tamil Nadu on the southeastern coast of India.
- Palk Bay is home to mangrove ecosystems or tidal swamps.
- Characterised by plants and trees that can withstand high salinity, these swamps are rich in biodiversity.
- The Mangrove trees themselves, offer coastal protection by checking erosion. Erosion affects not just the coastline, but also coral reefs.

- The tangled roots of mangrove trees help **retain and trap loose soil and thereby protect coral reefs and seaweed meadows from siltation.**
- Coral reefs are important ecosystems in maintaining healthy fish population.
- Mangrove forests also help fish population by providing space which act as **nurseries for juvenile fish**.
- In the recent decades, the mangroves of Palk Bay have been heavily degraded due to the **Tsunami of 2004, land encroachment,** rapid urbanisation, cattle grazing and agriculture.
- The degradation of mangroves resulted in the reduction of nursery space for juvenile fish, impacting fish populations in the region and as a result, the livelihood of the fishing communities of the region.
- Given the scale of the problem, solutions needed to be multipronged and involve multiple stakeholders. Local communities, government and civic organisations all came together not just to conserve the remaining mangroves, but also to restore it.
- Saplings of native species of plants and trees are being grown, planted and cared for.
- Live colonies of coral from the **Gulf of Mannar Biosphere Reserve are being transplanted to Palk Bay.** The existing mangroves and the region are being mapped and the way land is used around the mangrove is being studied.
- The local communities are actively involved in the conservation and restoration of the mangroves. **Education and awareness programmes about mangrove ecosystem** are being undertaken.
- Along with awareness programmes, the communities are also being provided with livelihood training, so they can earn an income in more ways than just fishing. All of these efforts are on-going.
- The health of the mangroves are improving and as it does, the **fish population will improve in quality and quantity, improving the lives of the communities**.
- As one can see, sustainable solutions take the needs of the people into consideration and the environment because both are interconnected.