

UNIT-3

Pollution and their Effects: Public Health Aspects of Environmental

Pollution and their Effects

Pollution refers to the introduction of harmful substances or energy into the environment, causing adverse effects on living organisms and natural systems. It is one of the biggest global environmental challenges today.

Pollution affects every aspect of life on Earth - from the air we breathe to the water we drink.

Controlling it requires collective efforts from individuals, governments and industries to ensure a healthier and sustainable future.

Types of Pollution :-

1] Air Pollution

caused by harmful gases, smoke and dust released into the atmosphere from vehicles, industries and burning fuels.

Common Pollutants: Carbon Monoxide, Sulphur Dioxide, Nitrogen Oxides.

Effects :-

- Respiratory diseases like Asthma and Bronchitis
- Global Warming due to greenhouse gases.
- Acid Rain damaging crops and buildings.

2] Water Pollution

Occurs when harmful substances like chemicals, sewage and waste are dumped into rivers, lakes and oceans.

Effects:

- Spread of Waterborne diseases like Cholera and Typhoid
- Death of Aquatic life
- Contamination of Drinking Water

3] Soil Pollution

Caused by improper disposal of waste, excessive use of fertilizers and pesticides, and industrial activities

Effects:

- Reduced soil Fertility
- Contamination of Crops
- Harm to humans through the food chain

4] Noise Pollution

Excessive or disturbing sound from traffic, construction, industries and loudspeakers.

Effects:

- Hearing Loss
- Stress and Sleep Disturbances
- Increased Risk of High Blood Pressure

5) Thermal Pollution

Discharge of hot water or heat into water bodies, mainly from power plants.

Effects:

- Decrease in oxygen levels in water
- Harm to Aquatic Organisms

Overall Effects of Pollution

- Human Health: causes diseases, allergies and even premature death
- Environment: Leads to Climate change, loss of Biodiversity and ecosystem imbalance.
- Economic Impact: Affects agriculture, fisheries and healthcare costs.

Ways to Reduce Pollution

- Use Public Transport and Cleaner fuels
- Reduce, Reuse and recycle waste
- Plant more Trees (Afforestation)
- Proper Waste Management and Treatment
- Use renewable sources like Solar and Wind

Public Health Aspects of Environment

The Environment plays a vital role in determining the health and well-being of human populations. Public health aspects of the environment focus on how physical, chemical and biological factors surrounding us influence health and contribute to the spread or prevention of Diseases. A healthy environment is essential for a healthy society, while a polluted or unsafe environment can lead to serious health problems and reduced quality of life.

Introduction

Environmental public health deals with assessing and controlling environmental factors that can potentially affect health. These factors include air, water, food, housing waste and social surroundings. Rapid industrialization, urbanization and population growth have increased environmental risks, making this field more important than ever. The environment is closely linked to human health, and any imbalance can lead to serious health problems. Public Health efforts must focus on creating and maintaining a clean, safe and sustainable environment. By controlling environmental

risks and promoting healthy practices, societies can prevent diseases and improve the overall quality of life. Protecting the environment is not only an ecological responsibility but also a crucial step toward ensuring a healthier future for all.

Major Environmental Factors Affecting Public Health

1. Air Quality

Clean air is essential for life, but increasing pollution has made it a major health concern.

Polluted air contains harmful gases and particulate matter that affect the respiratory system.

It leads to diseases such as Asthma, Bronchitis and even Lung Cancer. Long term exposure can also affect the heart and reduce life expectancy.

2. Water Supply and Sanitation

Safe Drinking Water and proper sanitation are fundamental to public health. Contaminated water spreads many infectious diseases.

Diseases like Cholera, Typhoid and Hepatitis A are commonly linked to unsafe water and poor sanitation. Proper sewage system and water treatment are necessary to prevent these diseases.

3. Food Safety and Hygiene.

Food Contamination due to poor handling, storage or environmental pollution leads to foodborne illnesses.

Lack of hygiene in food preparation can result in infections, malnutrition and poisoning, especially in children.

4. Housing and Living Conditions.

Housing conditions directly affect physical and mental health. Overcrowding, poor ventilation, dampness and lack of sanitation contribute to the spread of infectious diseases. Poor housing conditions are often associated with poverty and can worsen health inequalities.

5. Waste Management

Improper disposal of solid and liquid waste creates breeding grounds for insects and rodents. This increases the risk of diseases and environmental pollution.

Poor Waste Management contributes to the spread of illnesses like Dengue and Malaria.

6. Vector Control

Vectors such as mosquitoes, flies and rats transmit many dangerous diseases. Controlling these vectors is an important part of Environmental health. Measures include maintaining cleanliness, Eliminating Stagnant

Water and using Insecticides.

7. Occupational Environment

The workplace Environment affects worker's health.

Exposure to dust, chemicals, noise and unsafe machinery can cause injuries and diseases. Occupational safety measures and regulations are essential to protect workers.

8. Climate Change and Global Environmental Issues.

Climate Change has significant public health impacts.

Rising temperatures, floods, droughts and extreme weather events affect food production, water supply and disease patterns. It also contributes to heat-related illnesses and the spread of Infectious Diseases.

Impact on Public Health.

Environmental hazards have wide-ranging effects on human health:

- Increased incidence of infectious and chronic diseases.
- Higher mortality rates and reduced life expectancy.
- Malnutrition due to food and water scarcity.
- Mental stress and reduced quality of life.

Preventive and Control Measures

Improving Environmental Conditions can greatly enhance public health. Important measures include:

- Ensuring safe drinking water and sanitation.
- Controlling air and water pollution.
- Promoting proper waste management.
- Encouraging personal and community hygiene.
- Strengthening health education and awareness.
- Implementing environmental laws and policies.
- Supporting sustainable development.

Water Pollution

Water is one of the most essential natural resources for life. It is used for drinking, agriculture, industry and daily activities. However, increasing human activities have led to the contamination of water bodies, resulting in water pollution. Water pollution not only affects human health but also disturbs aquatic ecosystems and the overall environment.

Introduction

Water pollution refers to the contamination of water bodies such as rivers, lakes, oceans and groundwater by harmful substances. These pollutants may be chemical, physical or biological in nature, making the water unsafe for

consumption and harmful to living organisms.

Causes of Water Pollution

1. Domestic Sewage :- Household ^{waste} water containing human waste, detergents and food particles is often discharged into water bodies without proper treatment. This introduces harmful microorganisms and Organic Matter.
2. Industrial Waste :- Industries release toxic chemicals, heavy metals and hazardous substances into rivers and lakes. These pollutants are highly dangerous and difficult to remove.
3. Agricultural Runoff :- The Use of fertilizers, pesticides and insecticides in agriculture leads to runoff during rains. These chemicals enter water bodies and cause nutrient pollution, leading to algal blooms.
4. Oil Spills :- Oil Leakage from ships and offshore drilling spreads over water surfaces, blocking oxygen supply and harming marine life.
5. Solid Waste Dumping :- Improper Disposal of Plastics, garbage and other waste materials into water bodies contributes significantly to Pollution.

Effects of Water Pollution

Effects on Human Health:- Polluted Water is a major source of diseases. It can spread illnesses such as Cholera, Typhoid and Hepatitis A.

Drinking Contaminated Water can also lead to poisoning and long-term health problems.

Effects on Aquatic Life:- Water Pollution reduces oxygen levels, making it difficult for aquatic organisms to survive. It can cause the death of fish and other marine species, and disturb the natural balance of ecosystems.

Effects on Environment:- Polluted Water affects soil quality and crop production, when used for irrigation. It also leads to loss of Biodiversity and degradation of natural resources.

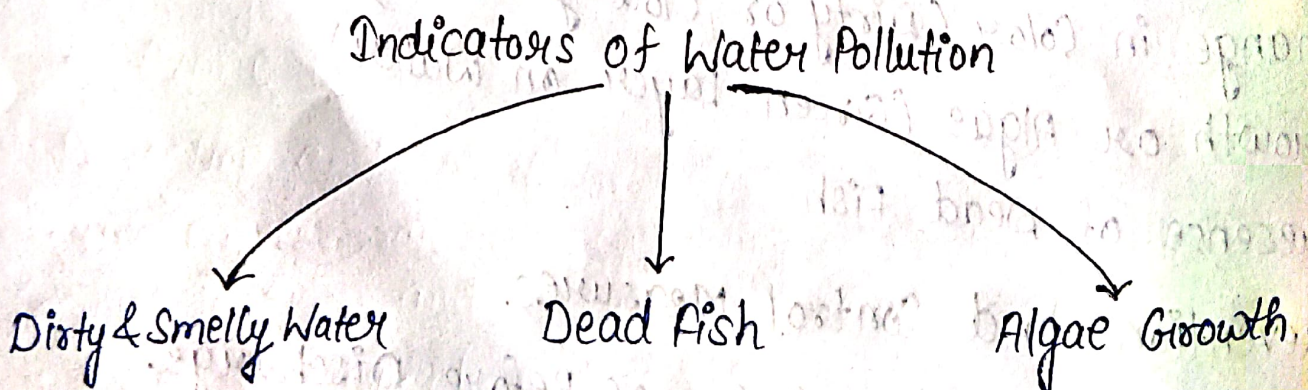
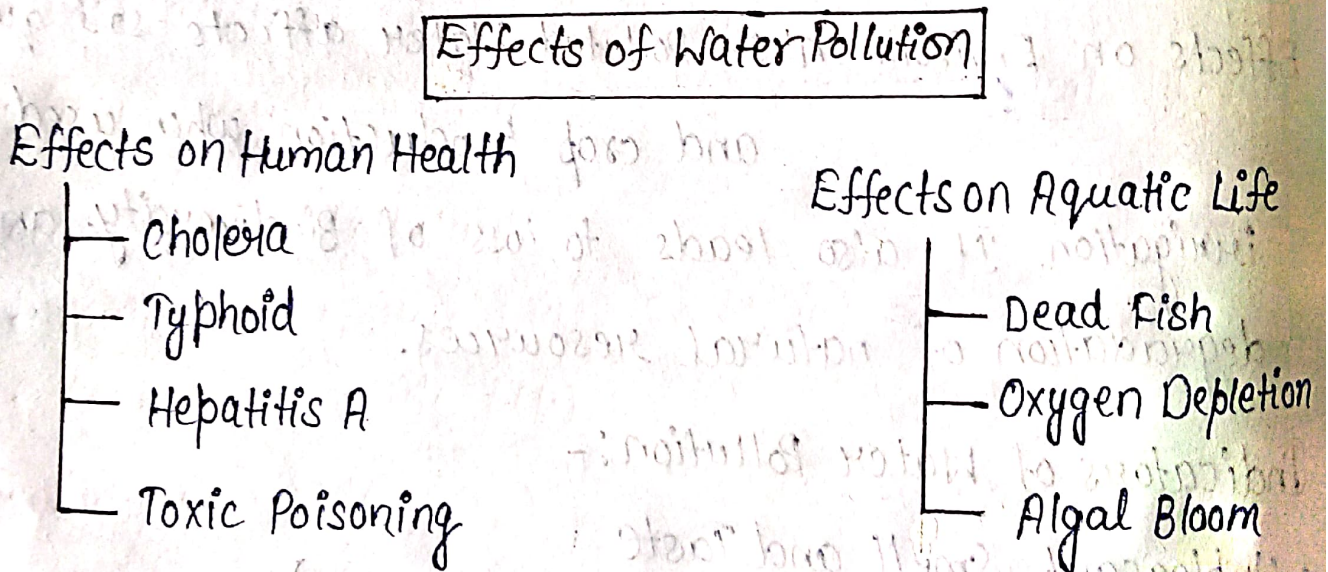
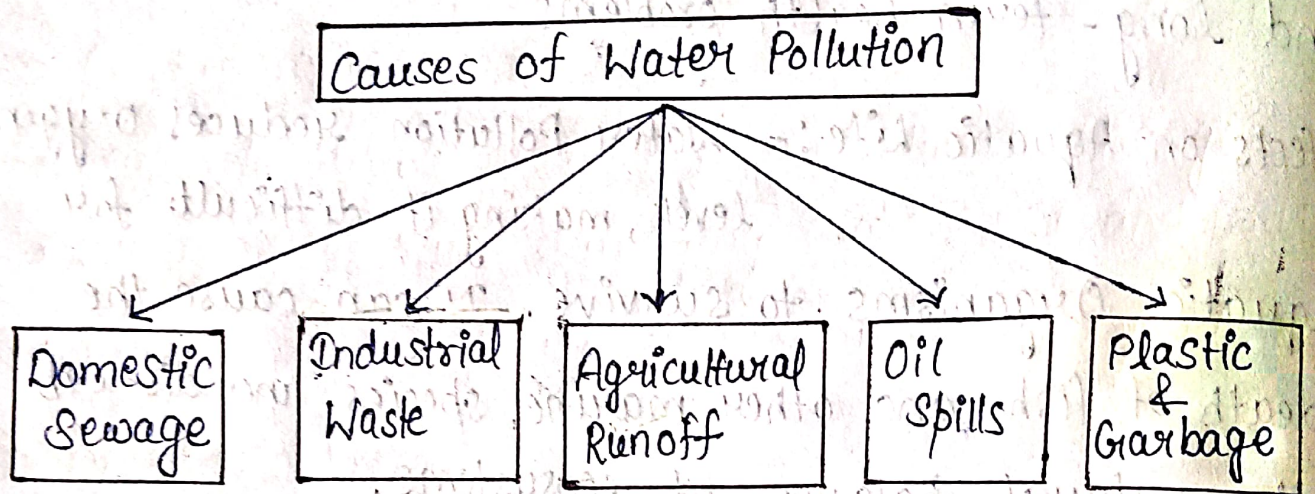
Indicators of Water Pollution:-

- Unpleasant Smell and Taste
- Change in Color (Dirty or Cloudy Water)
- Growth of Algae (Green-layer on Water)
- Presence of Dead Fish

Prevention and Control Measures.

- Proper Treatment of Sewage Before Discharge.
- Regulation and treatment of Industrial Waste.

- Reduced use of Fertilizers and pesticides.
- Avoid Dumping Waste into Water Bodies.
- Promoting Rainwater harvesting and water conservation
- Public awareness and strict environmental laws.



Air Pollution

Air Pollution is the contamination of atmosphere by harmful substances such as gases, dust and smoke that negatively affect living beings and the environment. Air Pollution is a serious threat to human health and the environment. Controlling it requires combined efforts from individuals, industries and governments to ensure cleaner air and a healthier future.

Major Sources of Air Pollution

1. Vehicular Emissions

- Cars, Buses and trucks release carbon monoxide, nitrogen oxides and particulate matter

2. Industrial Emissions

- Factories emit smoke, chemicals and toxic gases.

3. Burning of Fossil Fuels

- Coal, Petrol and Diesel release harmful pollutants and greenhouse gases.

4. Agricultural Activities

- Burning crop residues and use of pesticides

5. Domestic Sources

- Use of firewood, Coal and Biomass for cooking
- Indoor air pollution in poorly ventilated homes.

Effects of Air Pollution:-

→ On Human Health

- Causes respiratory diseases like Asthma and Bronchitis
- Increases risk of Lung Cancer
- Irritation of eyes, nose and throat

→ On Environment

- Leads to Global Warming and Climate Change
- Causes Acid Rain damaging crops, soil and Buildings
- Affects Plants Growth and reduces crops yield.

→ On Atmosphere

- Formation of Smog (Especially in cities)
- Ozone Layer Depletion (due to certain chemicals like CFCs)

Common Air Pollutants

- Particulate Matter (PM 2.5 & PM 10)
- Carbon Monoxide (CO)
- Sulfur Dioxide (SO₂)
- Nitrogen Oxides (NO_x)
- Ozone (O₃)

Prevention and Control

- Use Public Transport, carpooling or Electric Vehicles
- Shift to Clean and Renewable Energy Resources
- Avoid Burning Waste and Crop Residues
- Plant Trees (Afforestation)
- Follow Government Emission Standards

Air Pollution & Health Effects

Sources of Air Pollution

- Vehicle Emissions
- Factory Smoke
- Burning Fossil Fuels

Health Effects of Air Pollution

Short-Term

- Irritated Eyes
- Coughing & Wheezing
- Headaches

Types of Pollutants:

- PM 2.5 & PM10
- Carbon Monoxide (CO)
- Sulfur Dioxide (SO₂)
- Nitrogen Oxides
- Ozone O₃

Long-Term

- Asthma
- COPD
- Heart Disease
- Lung Cancer

Reducing Air Pollution

- Use of Public Transport
- Switch to Clean Energy
- Plant More Trees
- Avoid Burning Waste

Soil Pollution

Soil Pollution is the contamination of soil by harmful substances like chemicals, waste and pesticides, which reduce its quality and fertility.

Soil Pollution damages the land we depend on for food. Preventing it is essential for a healthy environment and future.

Main Causes :-

- Excessive Use of Fertilizers and pesticides
- Industrial Waste and Chemicals
- Dumping of Garbage and Plastics
- Sewage and Improper Waste Disposal

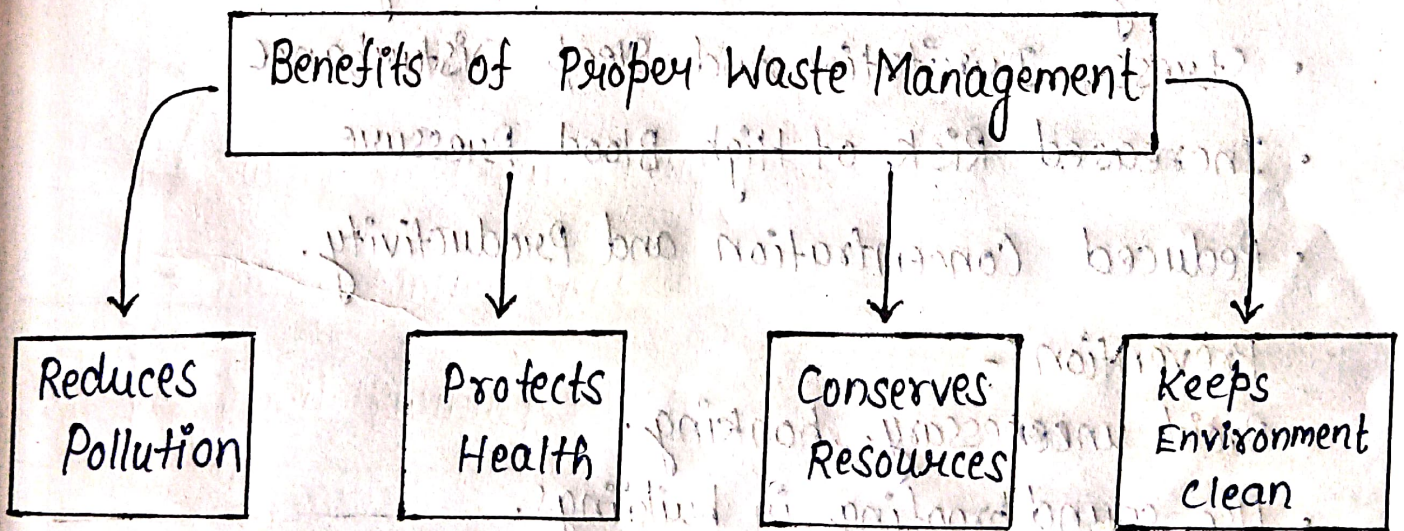
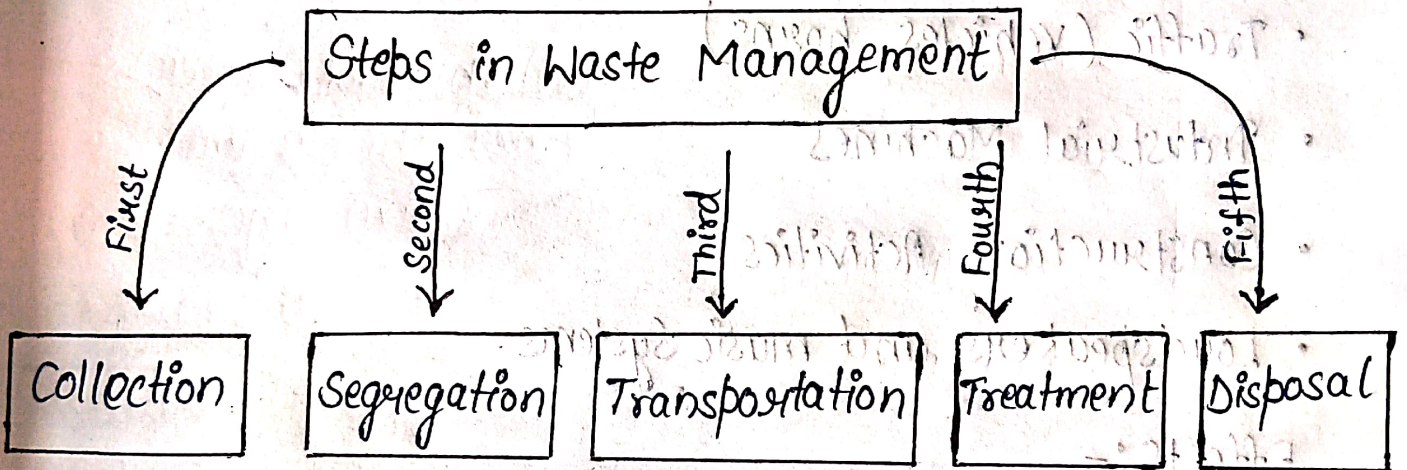
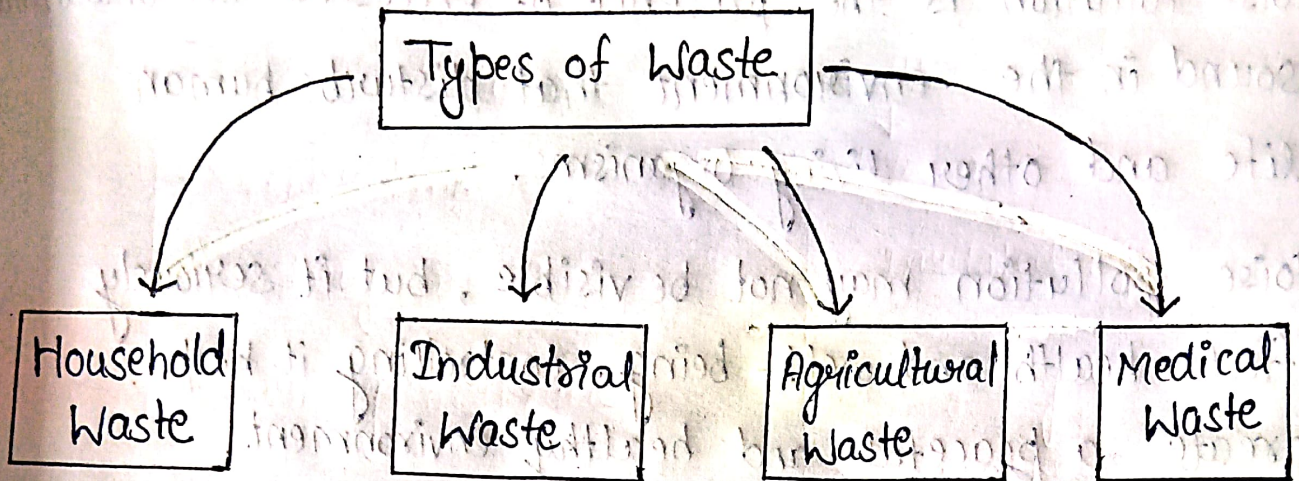
Effects :-

- Decreases soil fertility and crop production
- Contaminates food and water
- Harms human and animals
- Can cause health problems through the food chain

Prevention :-

- Use Organic Fertilizers and eco-friendly farming.
- Proper Waste Disposal and recycling.
- Reduce Use of harmful Chemicals
- Promote sustainable agriculture.

SOLID WASTE MANAGEMENT



Noise Pollution

Noise Pollution is the presence of excessive or unwanted sound in the environment that disturbs human life and other living organisms.

Noise pollution may not be visible, but it seriously affects health and well-being. Controlling it helps create a peaceful and healthy environment.

Main Sources:-

- Traffic (Vehicles, horns)
- Industrial Machines
- Construction Activities
- Loudspeakers and music Systems

Effects:-

- Hearing Problems and possible Hearing Loss
- Stress, Irritation and Sleep Disturbance
- Increased Risk of High Blood Pressure
- Reduced Concentration and Productivity.

Prevention:-

- Avoid unnecessary honking.
- Use sound proofing in buildings.
- Limit use of Loudspeakers
- Plant Trees to reduce noise
- Follow noise Control Laws.

))) NOISE POLLUTION (((((

— & Its Effect on Health —

