

Bharathidasan University
Centre for Differently Abled Persons
Khajamalai Campus
Tiruchirappalli-620 023
Tamilnadu



Bachelor of Computer Applications
(For Students with Speech and Hearing Impairment)

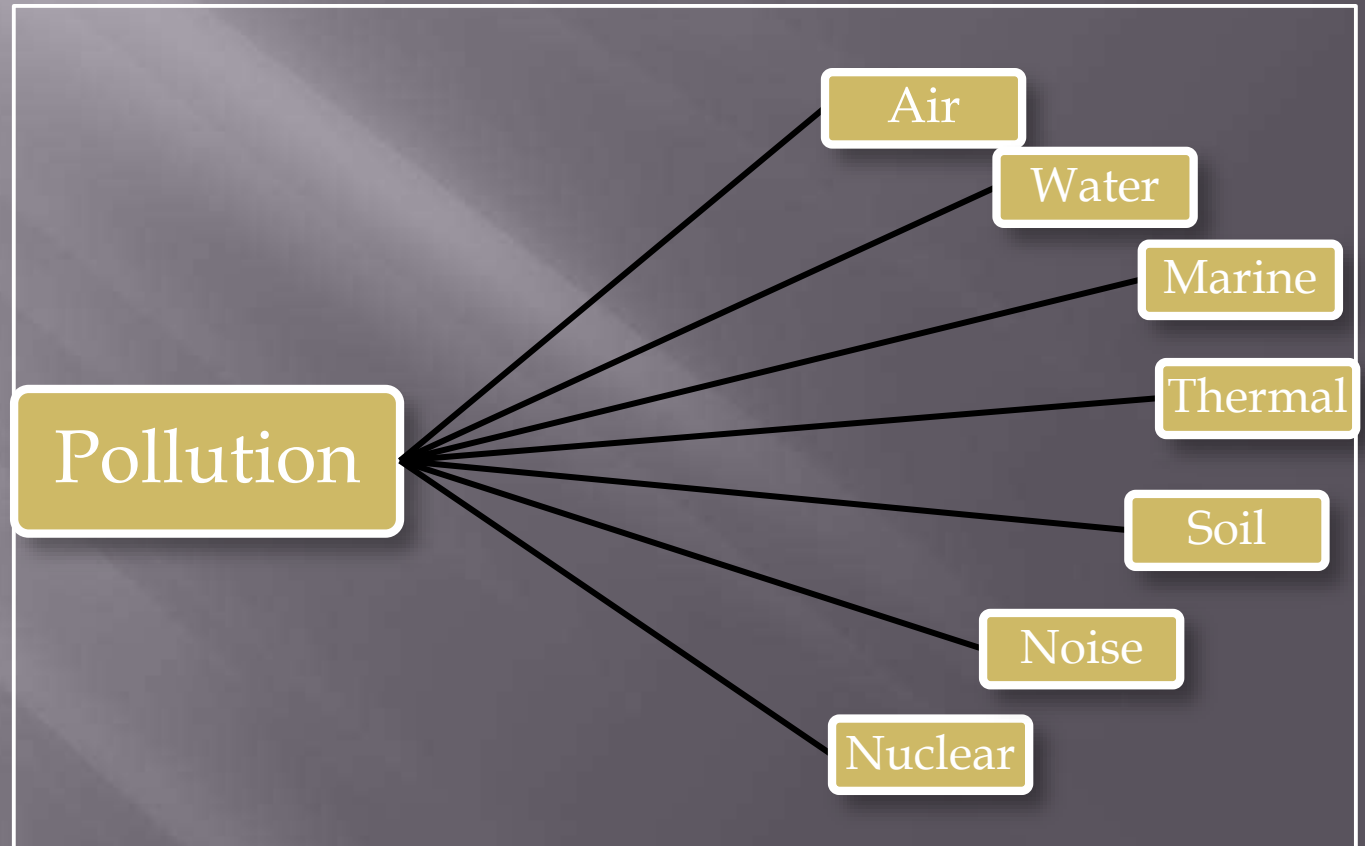
COURSE: ENVIRONMENTAL STUDIES
UNIT-5

Compiled By
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Definition of Pollution

- ▣ When Harmful Substances Contaminate the environment it is Called Pollution.
- ▣ It can be defined as any undesirable change in the physical, chemical, biological characteristics of any component of the environment which can cause harm to life and property.

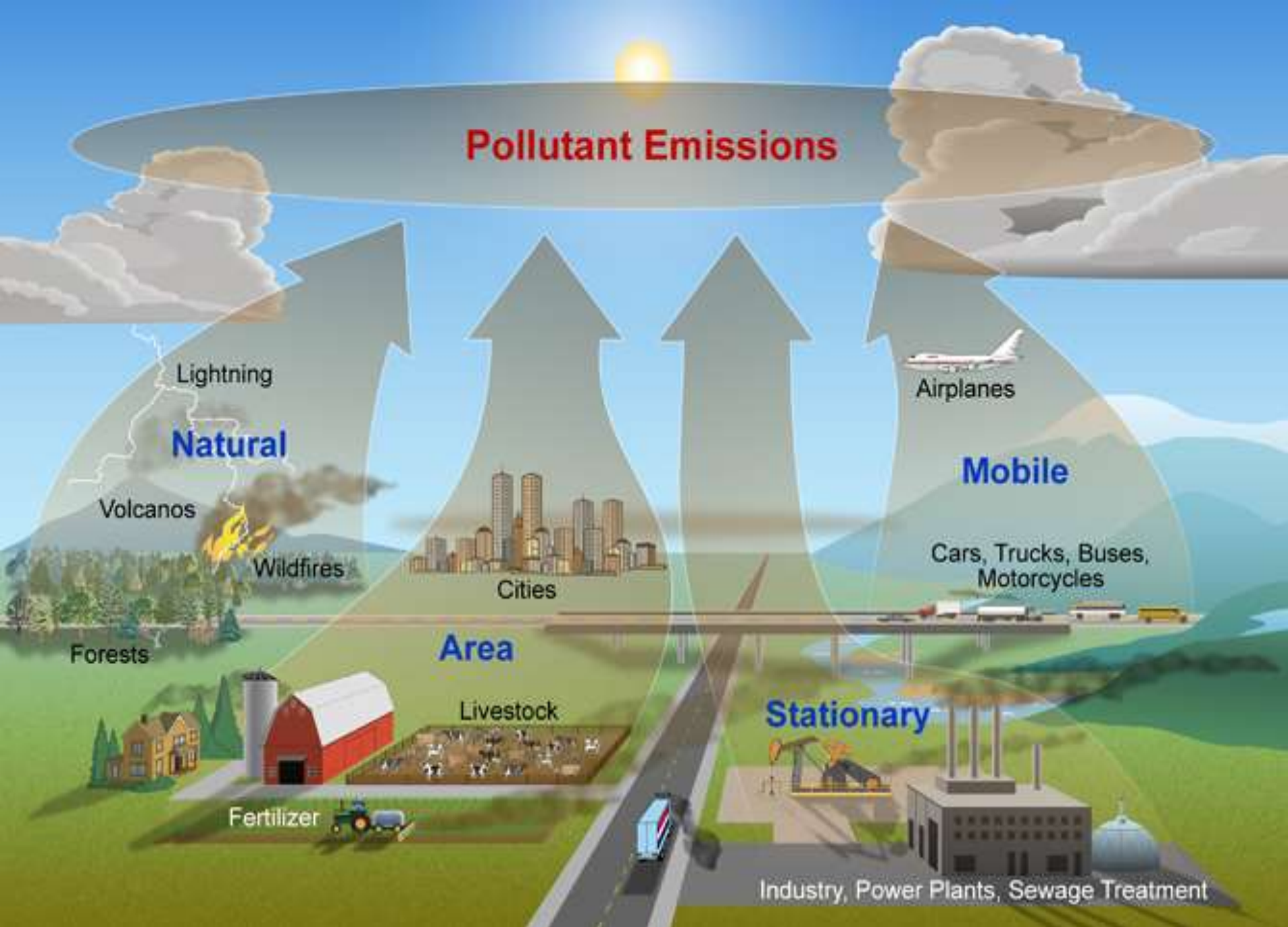
Types of Pollution



Air pollution



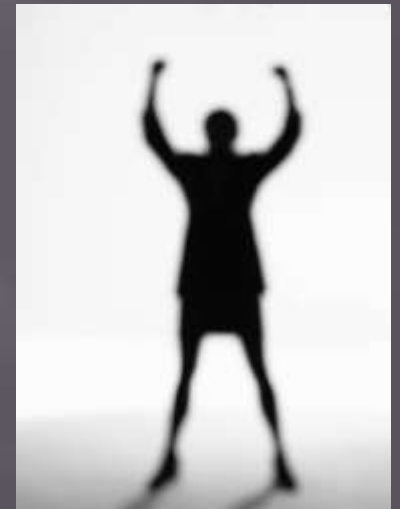
Pollutant Emissions



Effects of Air Pollution

Air Pollution affects

- ▣ Human health
- ▣ Animals
- ▣ Plants
- ▣ Materials
- ▣ Environment







Light injury



Moderate injury



Heavy injury

PAN-damaged milkweed leaves



Control Of Air Pollution

- ▣ Proper air pollution control devices in industries
- ▣ Using low sulphur coal
- ▣ Regular engine tune up, replacement of old more polluting vehicles
- ▣ Using mass transport system, bicycles etc
- ▣ Shifting to less polluting fuels
- ▣ Planting more trees
- ▣ No to FIRE CRACKERS in Diwali and other occasions



Water Pollution

WATER POLLUTION

- ❖ Water pollution refers to the contamination of water bodies. These may include lakes, rivers, oceans, aquifers and groundwater.



Surface Water Pollution

- Sewage



Industrial effluents



Synthetic detergents



Agrochemicals

Oil

Waste heat



- Organic Contaminants (Detergents, Herbicides, etc)
- Inorganic Contaminants (Heavy Metals, Ammonia, etc)
- Solid Waste (Plastics, Paper, Food waste)
- Thermal Pollution (Discharge of warm water into water bodies by factories)

SOURCES OF WATER POLLUTION

- ▣ Sewage
- ▣ Runoff of Pesticides & Fertilizers
- ▣ Solid Waste Disposal
- ▣ Untreated Effluents from Industrial and other activities
- ▣ Chemical and Oil Spills

Ground Water Pollution

- Is less comparatively as soil acts as a filter Still...
- Septic tanks
- Mining
- Deep well injection
- Arsenic , Nitrate, Fluoride

Marine Pollution

- Marine Pollution is caused due to Sewage Sludge, Industrial Effluents, Detergents, solid waste, plastic, etc.
- Sources :
 - River- Bring pollutants from drainage basins
 - Catchment Area- Human Settlements
 - Oil Drilling & Shipment
- Effects :
 - Fishes show mortality
 - Oil disrupts the insulating capacity of feathers
 - Due to loss of Buoyancy and subsequent drowning
Birds cause Deaths



Thermal Pollution



Control of Thermal pollution

- ▣ Cooling ponds, cooling towers and spray ponds



Noise pollution

- Unwanted and unbearable sound is “Noise”
- Sound travels in form of pressure waves through air, liquid or soild
- Measured on **DECIBEL SCALE**.
- Maximum during Diwali, Ganpati and other festivals
- Higher in Industrial area.
- 80 to 120 dB
- Crackers: 125 dB
- Construction: 100 dB



Sources and effects

- ▣ Transportation
- ▣ Heavy Machinery
- ▣ Construction activities
- ▣ Celebrations and household appliances
- ▣ Physiological and psychological changes
- ▣ Interferes communication
- ▣ Hearing damage
- ▣ Sleep disturbance



Noise standards

- ▣ Night 10 p.m. to morning 6 a.m.- loud noise banned.
- ▣ Declaration of Zones

Permissible dB levels

Area	Day time 6 am to 10 pm	Night time 10 pm to 6 am
a) Industrial	75dB	70dB
b) Commercial	65dB	55dB
c) Residential	55dB	45dB
d) Silence zone	50dB	40dB

Control

- Reduction at the source
- Proper maintenance of machineries
- Machineries should be covered
- Use of sound absorbing silencers
- Through law
- Planting more trees of broad leaves



Nuclear Or Radioactive Hazard

- Natural radioactive decay
- Give out fast moving particles, high energy radiations.
- Alpha and beta particles
- Nuclear accidents, test laboratories radioactive fallout
- Fukushima in Japan
- Pripyat in Ukraine



Effects and control

- ▣ Genetic damage : DNA alterations, gene damage, chromosome damage
- ▣ Somatic damage: Burns, miscarriages, eye cataract, cancers of skin, bones, breast.
- ▣ Proper siting.
- ▣ Proper disposal.



Soil pollution

- ▣ Soil is upper layer of earth crust, contains organic matter, fertile
- ▣ Dumping of wastes causes soil pollution
- ▣ Garbage
- ▣ Rubbish like glass, plastics, metallic cans, papers, cloth rags, containers
- ▣ Discharge of Industrial wastes.
- ▣ Fly ash from Thermal power plants
- ▣ Fertilizers and pesticides: DDT, endrin, Lindane.
- ▣ Sewage sludge and radioactive wastes

Effects and control

- Reduce soil productivity
 - Affects soil flora and fauna
 - Sludge contains worms, bacteria and pathogens.
 - Radioactive wastes enter food chain:
Strontium 90 mimics calcium.
-
- Treatment before discharge
 - Convert waste to biogas, fuel etc.
 - Recover from soil.

SOLID WASTE AND ITS MANAGEMENT

- ▣ Higher standards of living...generate more waste
- ▣ Quantities are enormous
- ▣ Management is very important
- ▣ Sources of solid waste include: Waste from homes, hospitals, industries, parks, gardens, shops, construction and demolition waste
- ▣ In each and every action of humans, Solid waste is generated



Two types of Waste:

BIODEGRADABLE

- ▣ Vegetable waste
- ▣ Food waste
- ▣ Tea leaves
- ▣ Egg shells
- ▣ Dry leaves

NON-BIODEGRADABLE

- ▣ Polythene bags
- ▣ Glass bottles
- ▣ Scrap metal
- ▣ Tins, cans etc etc
- ▣ Electronic waste

EFFECTS OF SOLID WASTE

- ▣ Waste heap up on roads
- ▣ Litter surroundings
- ▣ Foul smells
- ▣ Vector breeding
- ▣ BURNING produces toxic gases



Management

- ▣ Following methods in use:

- ▣ Composting

- ▣ Sanitary landfill

- ▣ Incineration

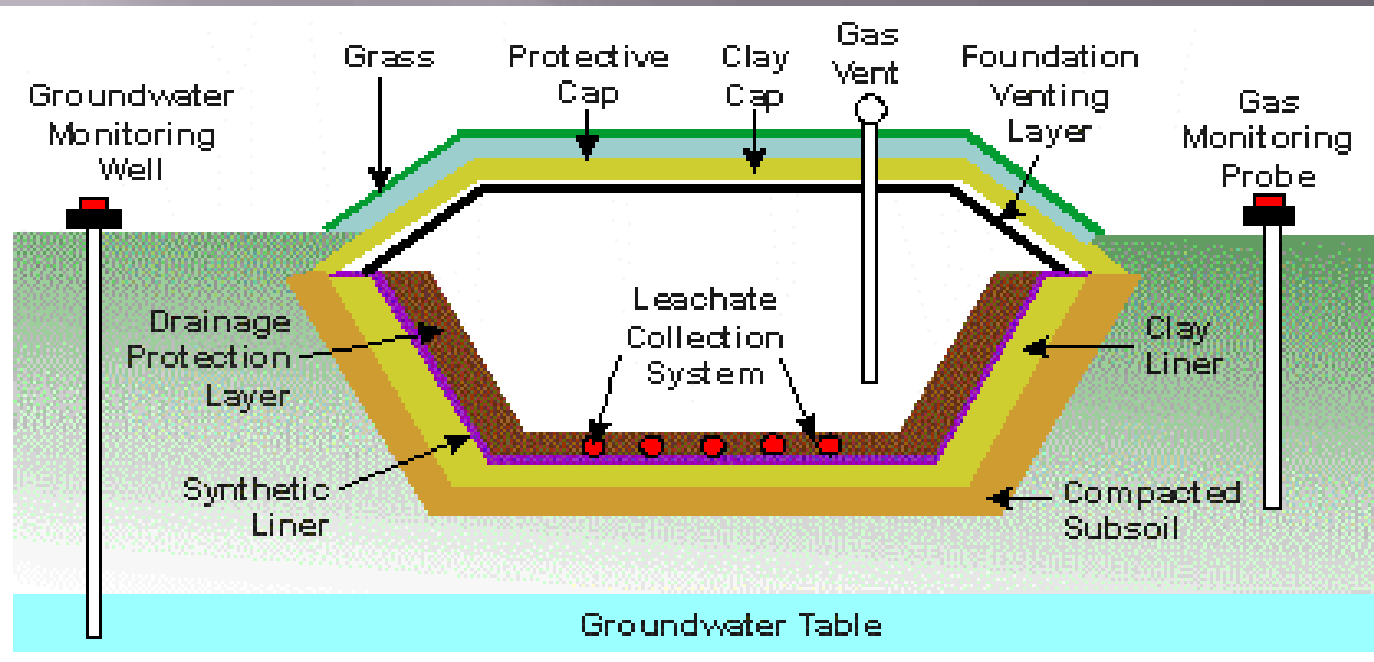
- ▣ Segregation of waste

- ▣ Current trends of 3- R's

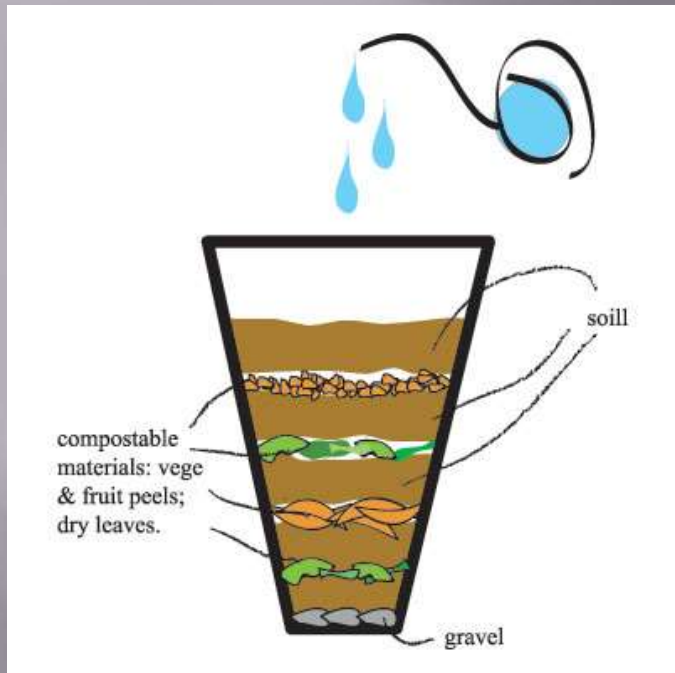
- ▣ Reduce Reuse Recycle

Incineration





Composting



Major pollution episodes

- ▣ Love canal tragedy
- ▣ Bhopal gas tragedy
- ▣ Chernobyl disaster
- ▣ Exxon Valdez leak episode
- ▣many more

Certain initiatives

- Laws have been made and are followed
- Pollution level Standards: established and compulsory to maintain.
- Pollution control boards: State and Central (SPCB's- like **MPCB** (Maharashtra Pollution Control Board) and CPCB)
- NGOs
- Research and development of better technologies
- Awareness in schools and colleges, offices.
- Awards

Role of an Individual in Pollution prevention

- Think globally act locally
- Use eco-friendly products
- Use rechargeable batteries
- No to **excess** pesticides, chemicals, paints, solvents
- Use less or only required quantity of resource
- PLANT MORE TREES(local species)
- Best from Waste
- 3 R'S- Reduce, Reuse, Recycle

POLLUTION PREVENTION AND CONTROL



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Divisional Environment Officer
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AIR POLLUTION

❖ Air pollution is the introduction of particulates, biological molecules, or other harmful materials into the Earth's atmosphere, causing disease, death to humans, damage to other living organisms such as food crops, or the natural or built environment.



Control of air pollution

- ▣ Standard for Air
- ▣ Laboratory equipment
 - - ambient air monitoring station
 - - portable gas analyser
- ▣ Smoke control Action plan

LAND POLLUTION

Land pollution refers to the deposition of solid or liquid waste materials on land or underground in a manner that can contaminate the soil and groundwater, threaten public health, and cause unsightly conditions and nuisances.



SOURCES OF LAND POLLUTION

- ▣ Domestic Solid Waste (Garbage, Rubbish, Trash)
- ▣ Construction and Demolition Waste
- ▣ Agricultural Waste
- ▣ Industrial Waste

NOISE POLLUTION

- ❖ Noise is generally defined as unwanted sound.
- ❖ Sound affects man physically, psychologically and socially
- ❖ Noise may be continuous or intermittent and may be of high frequency or a low frequency



SOURCES OF NOISE POLLUTION

Industrial (power plants, stone crushing, metal workshops, cabinet making);

Multipurpose halls including wedding halls;

Bungalows along the coast;

Places of entertainment, including night clubs;

Road traffic e.g. moving trucks, automobiles, buses, especially those with modified silencer system;

Community noise e.g. radio/TV, loudspeakers, pool houses and alarms;

Animals e.g. dogs, cats, crows;

Use of loud speaker, amplifier, musical instrument, electrical or mechanical device for religious activities;

Aircrafts and speed boats;

Neighbourhood;

Machinery (generator sets, compressors, air conditioning units, boilers, pumps, motors);

Others including construction works, road infrastructural works, public gathering, vibration, ice cream sellers, vendor shouts.



HEALTH EFFECTS OF NOISE POLLUTION

- ◆ Hearing Loss (including occupational hearing loss)
- ◆ Stress
- ◆ High Blood pressure
- ◆ Sleep Loss
- ◆ Distraction
- ◆ Productivity Loss
- ◆ Cause Irritability,
- ◆ headache
- ◆ Annoying and interfere with communications.



