

# ENVIRONMENTAL POLLUTION



# Environmental pollutions

- Any alteration to air, water, soil or food that threatens the health, survival capability of humans or other living organisms, is called pollution.
- Pollution is a global problem.

# Causes of pollution

- **Natural**

- Volcanic eruptions
- Soil erosion/ sediment transport
- Dust storms
- Tsunami

- **Man made**

- Domestic
- Industrial
- Agricultural

Mining



# Types of pollution

- Water pollution
  - Surface water
  - Ground water
  - Marine water
- Soil or land pollution
- Air pollution
- Noise pollution

# Water pollution

- Water pollution refers to degradation of water quality.
- Water in domestic uses must be free from constituents harmful to health. It should taste and smell good. It should not damage household appliances.
- Water quality for industrial processes varies widely depending on the process. Some requires distilled water also.
- Water pollution can occur as
  - Surface water pollution
  - Ground water pollution
  - Marine pollution

# Some sources of water pollution

- Surface water

- Industrial effluent
- Urban runoff
- Agricultural runoff
- Accidental spills of chemicals
- Sediments.
- Sewage.
- Mining activity.
- Temperature.

- Groundwater

- Leaks from waste disposal site
- Saltwater intrusion into coastal aquifers
- Seepage from mines and septic systems
- Seepage from pesticides
- Seepage from accidental spills
- Seepage from polluted stream

# Major categories of water pollution

- Infectious agents: disease causing agents or pathogens, including bacteria, viruses, protozoa, parasites. These come from raw sewage and animal waste and they may be responsible for 80% of the disease in the developing countries.
- Water soluble inorganic chemicals: acid, salts and metals. Make water unfit to consume and use for irrigation. Also can harm organism.

- Organic chemicals: including oil, gasoline, plastics, pesticides and detergents. Present health risk to human and other organisms.
- Plant nutrients: nitrates, phosphates, ammonium... from fertilizer mostly.
- Sediments: mud, silt , sand. disrupt photosynthesis and bad for aquatic animals.
- Heat: from cooling water for power plants and other industrial plants also affect aquatic lives directly.



# Causes of surface water pollution

- Uncontrolled discharge of waste water from agricultural land
- Discharge of domestic waste water
- Industrial waste
- Acid rain through air pollution is also one of the causes of surface water pollution.
- Decaying of organic matters into water bodies
- Salt water intrusion in ground water
- Leaching of chemicals
- Wash down of components of volcanic eruptions

# Ground water pollution

- Domestic and industrial waste water pollutes the ground water.
- Pesticides used in agricultural activities enter the ground water through irrigation water.

# Marine pollution

Pollutants	Sources	Impacts
sediments	Deforestation, soil erosion, mining and farming	Blocks water flows and coastal ecosystems, clogs gills of fish
Pathogenic organisms	Sewage and livestock wastes	Contaminates coastal swimming places and seafood, spreading diseases
Litter, specially plastics	Disposed by people and plastic industry, thrown overboard from ships	Pollutes the water and beach areas
Oil	industries, ships and oil tankers	Kill sea fish and causes diseases in marine life
Radioactive waste	Discharge from nuclear power stations, reprocessing plants etc.	Causes diseases in marine life
Toxic waste (heavy metal and chemicals)	Metals from mining and industries, pesticides from farms, discharge water from cities	Poisons marine life and contaminates sea food

## Coastal/marine pollution: why should we care

- About half of our population live within 200 km of the coast
- We eat at least 15 lbs. of seafood per person each year
- Just about everything bought & sold goes through ports in cargo ships
- 90% of ocean species live in continental shelf close to land. Each one play vital role for balance of the nature.
- 17% of our oil and 25% natural gas come from offshore

## Effects of Water Pollution

- ☐ Kills life that inhabits water-based ecosystems. Dead fish, birds, dolphins, and many other animals often found on beaches, killed by pollutants in their habitat.
- ☐ Pollution disrupts the natural food chain as well. Pollutants such as lead and cadmium are eaten by tiny animals. Later, these animals are consumed by fish and shellfish, and the food chain continues to be disrupted at all higher levels.
- ☐ - Eventually, humans are affected by this process as well. People can get diseases such as hepatitis by eating seafood that has been poisoned.
- ☐ - Drinking polluted water can cause cholera or typhoid infections, along with diarrhea.

# Measures to control water pollution

- Pollution can be reduced by providing suitable facilities for collection, treatment and disposal of domestic waste.
- Adopting modern technologies in industries that use less water.
- Reusing and recycling industrial waste water.
- Preventing wild dumping of solid and liquid waste on land.
- Providing proper sanitation facilities at urban and rural areas.

# Land or soil pollution

Dumping of solid wastes and waste water alter the structure, density, fertility of the soil and kill the microorganisms that exist in the land mass. Land pollution not only makes the soil unfit for use also become a source of ground water pollution.

# Causes of land pollution

- Discharge of liquid effluents from domestic and industrial activities on land
- Dumping of solid refuse resulting from domestic, industrial, agricultural and health care activities
- Mining activities
- Agricultural activities



## Effects of Land Pollution

- Risk of seeping into the ground water causing contamination – affect plant & animal
- Runoff from contaminated land can lead to water pollution
- Land may become unfit for crop production
- Toxins may contaminate food chain & ultimately enter human body causing disease

# Air pollution

Air pollution is the introduction of chemicals, particulate matter, or biological materials into the atmosphere that cause harm or discomfort to humans or other living organisms, or cause damage to the natural environment or built environment.

# Sources of air pollution

## Natural sources

- Emission of natural gases
- Volcanic eruptions
- Decomposition of organic matter
- Dust storms
- Forest fires

## Man-made sources

- Industrial activity
- Construction activity
- Mining activity

automobiles

## Stationary sources

- Those have a relatively fixed location

## Mobile sources

- Emitters of air pollutants that move from place to place while yielding emissions. These includes automobiles , trucks, buses, aircrafts, ships and trains.

# Causes of air pollution

- Burning fossil fuels in power stations and exhaust fumes from cars, trucks and buses.
- Waste burnt from chemical and other industries
- Bare soil in agricultural areas picked up and carried by the wind
- Increased use of automobiles
- Increased use of chemicals, especially CFCs

# Effects of air pollution

- Reduced visibility
- Poor air quality
- Formation of acid rain
- Increase the earth's temperature. Greenhouse gases are another source of air pollution.
- Rising sea levels
- Depletes the ozone layer in the stratosphere, leading to ozone holes
- More heat radiated from the surface

## Effects of air pollution continued...

- Health problem particularly asthma, bronchitis and other respiratory problems
- Increased risk of cancer in people, especially skin cancer
- Increased acidity in lakes leading to death of fish and plant life
- Increased acidity in soils reducing crop yield and killing trees
- Changes in world weather (more storm and drought)

Less food supply, in extreme cases leading to famine

- Acid rain encompasses both wet(rain, snow, fog) and dry acidic depositions that occur in areas where major emissions of sulfur oxides ( $\text{SO}_x$ ) and nitrogen oxides ( $\text{NO}_x$ ) result from burning fossil fuels.
- Pure rain fall has a pH about 5.6 where 1 is highly acid and 7 is neutral. Acid rain is defined as precipitation in which the pH is below 5.6.
- Acid rain damages not only forests and lakes but also many building materials, including steel, paint, plastics, cement, galvanized steel and several type of rock, especially limestone, sandstone and marble.

# Smog

There are two major types of smog.

- *Photochemical smog* which is sometimes called L.A. type smog or brown air. Solar radiation is particularly important for the formation of photochemical smog. It involves both NO and hydrocarbons. The development of these type of smog is directly related to automobiles use.
- *Sulfurous smog* which is sometimes referred to as London-type smog, grey air or industrial smog. Sulfurous smog is produced primarily by burning coal or oil at large power plants. Sulfur oxides and particulates combined under certain meteorological conditions to produce a concentrated sulfurous smog.

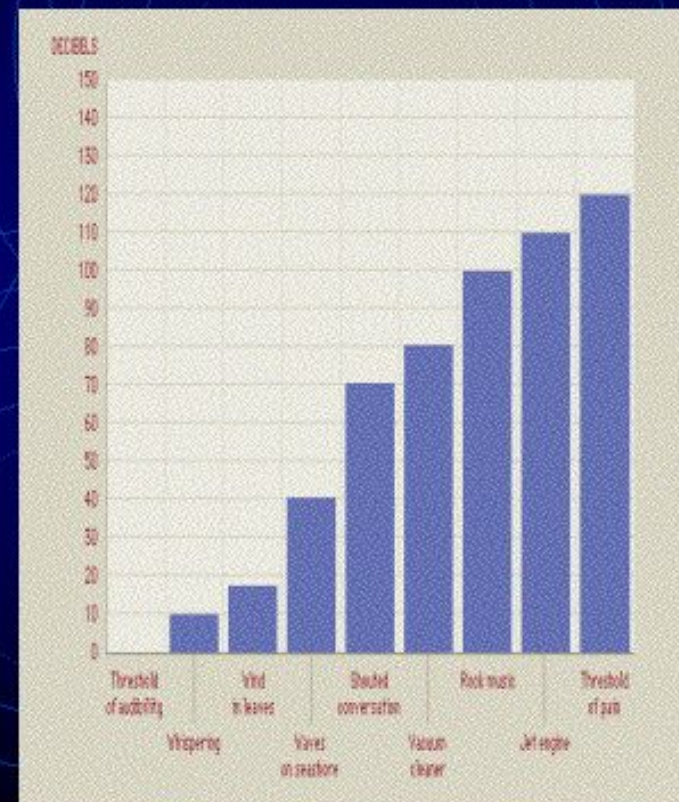


# Noise pollution

- Sound is a physical phenomenon recognized as a physiological response by the hearing organ. Sound is a series of alternative waves traveling in a medium such as air from a vibrating body.
- Noise can be defined as disturbing sound. It is an undesirable phenomenon and considered as an environmental pollutant.

# Sources of Noise Pollution

- Outside
  - Construction
  - Road traffic
  - Airports
  - Factories
- Inside
  - Phones
  - TV's / Radios
  - Appliances
  - Power tools / lawnmower
- Main source is due to increasing population and urbanization



# Effects of Noise pollution

- Any unwanted sound that our ears have not been built to filter can cause problems within the body. Our ears can take in a certain range of sounds without getting damaged.
- Constant exposure to loud levels of noise can easily result in the damage of our eardrums and loss of hearing, causing deafness
- Excessive noise pollution in working areas such as offices, construction sites, bars and even in our homes can influence psychological health.
- Studies show that the occurrence of aggressive behavior, disturbance of sleep, constant stress, fatigue, depression, anxiety, hysteria and hypertension in humans can be linked to excessive noise levels.
- Noise pollution can cause headaches, high blood pressure, respiratory problems, racing pulse
- Noise affects brain responses and people's ability to focus, which can lead to low-performance levels over time.

# THANK YOU

