

Pollution

Pollution

- Pollution is the effect of undesirable changes in our surroundings that have harmful effects on plants, animals and human beings.
- During the last few decades we have contaminated our air, water and land on which life itself depends with a variety of waste products.
- Pollutants include solid, liquid or gaseous substances present in greater than natural abundance produced due to human activity, which have a detrimental effect on our environment.
- The nature and concentration of a pollutant determines the severity of detrimental effects on human health. An average human requires about 12 kg of air each day, which is nearly 12 to 15 times greater than the amount of food we eat.

- From an ecological perspective pollutants can be classified as follows:
- Degradable or non-persistent pollutants: These can be rapidly broken down by natural processes. Eg: domestic sewage, discarded vegetables, etc.
- Slowly degradable or persistent pollutants: Pollutants that remain in the environment for many years in an unchanged condition and take decades or longer to degrade. Eg: DDT and most plastics.
- Non-degradable pollutants: These cannot be degraded by natural processes. Once they are released into the environment they are difficult to eradicate and continue to accumulate. Eg: toxic elements like lead or mercury.

- **Air pollution** is the presence of substances in the atmosphere that are harmful to the health of humans and other living beings, or cause damage to the climate or to materials.
- Air pollution may cause diseases, allergies and even death to humans; it may also cause harm to other living organisms such as animals and food crops, and may damage the natural environment (for example, climate change, ozone depletion or habitat degradation) or built environment (for example, acid rain).

Causes of Air Pollution

- The Burning of Fossil Fuels
- Industrial Emission
- Indoor Air Pollution
- Wildfires
- Microbial Decaying Process
- Transportation
- Open Burning of Garbage Waste
- Construction and Demolition
- Agricultural Activities
- Use of chemical and synthetic products

Control the damage caused by Air Pollution

- Conserving the energy is the first step towards a better future with clean air to breathe.
- Understanding the concept and imbibing the habit of reducing, reuse, and recycle is crucial.
- Use public transport whenever it is feasible to save fuel and reduce vehicle pollution.

Effects of Air Pollution

- High levels of air pollution can cause an increased risk of heart attack, wheezing, coughing, and breathing problems, and irritation of the eyes, nose, and throat. Air pollution can also cause worsening of existing heart problems, asthma, and other lung complications.
- Like humans, animals can suffer from a number of health problems due to air pollution, including birth defects, reproductive failure, and diseases.
- Air pollution causes a number of environmental effects in addition to the effects on humans and animals.

Effects of Air Pollution

- Acid rain contains high levels of nitric and sulfuric acids that are created by oxides and sulfur oxides released into the air by the burning of fossil fuels. Acid rain damages trees and acidifies soils and water bodies, making the water too acidic for fish and other aquatic life.
- Nitrogen oxides released into the air by the burning of fossil fuels also contribute to the nitrogen responsible for toxic algae blooms.
- The ozone layer in the stratosphere forms a protective layer that reflects harmful ultraviolet rays back into space that would otherwise destroy animal and plant life.

Effects of Water Pollution

- Water pollution is a serious threat to humans, animals, and aquatic life.
- The effects of water pollution depend on which chemicals are being dumped where. Bodies of water that are near urbanized areas tend to be heavily polluted by dumping of garbage and chemicals, both legally and illegally, by industrial plants, health centres, and individuals.
- By far the biggest consequence of water pollution is the death of aquatic creatures, which can disrupt the entire food chain. Pollutants such as cadmium, mercury, and lead are eaten by tiny aquatic organisms that are then eaten by fish and shell fish, becoming more concentrated with each step up the food chain and causing serious problems in humans and wildlife.

Effects of Water Pollution

- Nutrient pollution can cause toxic algal blooms in drinking water sources that create toxins that kill fish and other aquatic animals. Direct exposure to this toxic alga causes serious health problems in humans including neurological effects, respiratory problems, stomach and liver illness, and rashes.
- A consequential problem is created when disinfectants used to treat drinking water reach water polluted with toxic algae, they react creating dioxins. Dioxins are extremely harmful chemical compounds that have been linked with reproductive and development problems, and even cancer.

Effects of Land & Soil Pollution

- Contaminated land and soil can cause various problems on the skin, respiratory problems, and even different kinds of cancers.
- These toxic substances come into contact with the human body directly through eating fruits and vegetables that have been grown in polluted soils, being watered with contaminated water.
- Deforestation is the biggest concern when it comes to land degradation and soil erosion and destruction of ecosystems and habitats.
- Deforestation also increases the amount of carbon dioxide that is usually taken out of the air by trees

Effects of Noise & Light Pollution

- Noise pollution can cause stress, anxiety, headaches, irritability, hearing loss, and sleep loss resulting in decreased productivity.
- Oil drills, submarines, and other vessels on and in the ocean can cause excessive noise that has resulted in the injury or death of marine animals, especially whales.
- Too much light causes eye strain and stress. Light pollution also causes a decrease in the hormone melatonin that helps us to fall asleep, resulting in restlessness and fatigue.
- Many mammals, insects, birds, and reptiles are photoperiodic; meaning their movement, mating, growth and development, and eating cycles are regulated by natural light patterns. Light pollution can interfere with these natural behaviours and cycles, causing a decrease in wildlife populations.

Solid Waste Management: Causes, Effects and Control Measures of Urban and Industrial Waste

- In ancient cities, food wastes were simply thrown into the unpaved streets where they accumulated.
- Around 320 B.C. In Athens, the first known law forbidding this practice was established and a system of waste removal began to evolve in several eastern Mediterranean cities.
- Until recently the disposal of municipal solid waste did not attract much public attention.

Characteristics of municipal solid waste 1

- Solid wastes are grouped or classified in several different ways.
- The term municipal solid waste (MSW) is generally used to describe most of the non-hazardous solid waste from a city, town or village that requires transport to a processing or disposal site.
- Sources of MSW include private homes, commercial establishments and institutions as well as industrial facilities.
- However MSW does not include wastes from industrial processes, construction and demolition debris, sewage sludge, mining wastes or agricultural wastes.

Characteristics of municipal solid waste 2

- Municipal solid waste can contain wet garbage such as vegetables, left over food, egg shells, as well as dry garbage such as paper, plastic, wood pieces, etc.
- **Control measures of urban and industrial wastes:**
- An integrated waste management strategy includes three main components:
 - Source reduction.
 - Recycling.
 - Proper disposal.

Role of an Individual in Prevention of Pollution

- Everyone of us is individually responsible for the quality of the environment we live in.
- Our personal actions can either worsen or improve our environmental quality.
- Several people may feel that environmental problems can be solved with quick technological fixes.
- Decisions and actions taken by individuals to a very large extent determine the quality of life for everyone.
- Individuals should also make a firm resolution to develop environmentally ethical lifestyles.

- Some of our wastes can be diluted, decomposed and recycled by natural processes.
- Natural processes also provide services of flood prevention, erosion control at no costs at all.
- Concepts that help individuals contribute towards a better quality of environment and human life.
 - Develop respect for all forms of life.
 - Each individual must try to answer four basic questions:
 - Where do the things that I consume come from?
 - What do I know about the place where I live?
 - How am I connected to the earth and other living things?
 - What is my purpose and responsibility as a human being?

- Try to plant trees. They reduce air pollution.
- Try to recycle paper products and use recycled paper.
- Help in restoring a degraded area by joining an afforestation program.
- Use pesticides only when absolutely necessary and use them in as small amounts as possible.
- Depend organic vegetables and fruits.
- Reduce the use of fossil fuels. This reduces air pollution.
- Buy permanent goods and have them repaired as far as possible instead of disposing them off. Such products end up in landfills that could pollute ground water.