ENVIRONMENT

What is Environment?

Environment refers to the surroundings and every thing around us. The natural environment, commonly referred to simply as the environment, encompasses all living and non-living things occurring naturally on Earth or some region thereof.

Environment Pollution

Environment protection has become a continuous crisis for the nation. Environment and economic growth are complimentary for developing countries like India. Major environmental pollution are: air pollution, water pollution, soil pollution, green house effect & global warming and depletion of ozone layer.

Air/Atmospheric Pollution

Air is the ocean we breathe. Air supplies us with oxygen which is essential for our bodies to live. Air pollution is aggravated because of four major developments: increasing traffic, growing cities, rapid economic development and industrialization. Every day, a person inhales on an average about 20,000 litres of air. Every time we breathe, we risk inhaling dangerous chemicals that have found their way into the air.

"I'll go out for a breath of fresh air" is an often-heard phrase. But how many of us realize that this has become irrelevant in today's world, because the quality of air in our cities is anything but fresh.

Let us Save the Planet

What is Air Pollution?

Air pollution is also known as atmospheric pollution. Human activities release substances into the air, some of which cause problems for humans, plants and animals, which pollutes the air.

Causes of Air Pollution:

- Industries.

- Transport: Automobiles, ships and aircrafts (which uses petrol/diesel/coal as fuel).
- Diesel exhaust is a major contributor to combustion derived particle matter air pollution.
- Coal-/gas-based electricity generation.
- Burning firewood, open burning of wastes, forest fire, etc.
- Volcano eruptions.
- CFCs (commonly used in refrigerators and body spray containers).
- Odours (such as from garbage, sewage, and industrial processes).

Impacts of Air Pollution:

- According to WHO, Air pollution is a significant risk factor for multiple health conditions including respiratory infections, heart disease, and lung cancer.
- Air pollution has also been associated with increased incidence and mortality from coronary artery disease.
- Smoke, emissions from automobiles, tobacco smoke could impair lung function.
- Increased risk of developing asthma from exposure to traffic-related air pollution.
- There are also possible associations between air pollution and other forms of cancer, including cervical cancer and brain cancer.
- High exposure to air pollutants have the possibility of children living within them to develop asthma, pneumonia and other lower respiratory infections as well as low initial birth rate.
- Tobacco smoke is known to cause cancer – not only to the smoker but also affecting passive smokers (the person who is in the vicinity of a smoker)..
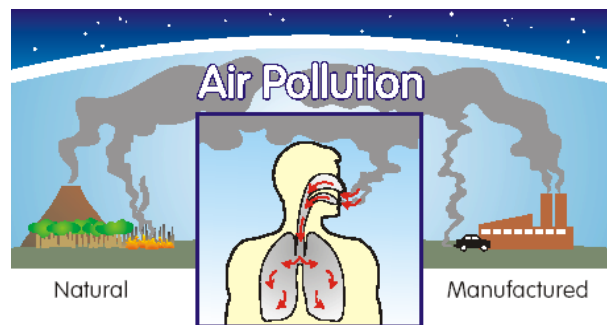
AQI Reduce your risk by using the Air Quality Index (AQI) to plan outdoor activities – www.airnow.gov

| AQI Levels of Health Concern	AQI Values	What Action Should People Take?
Good	0-50	**Enjoy Activities**
Moderate	51-100	**People unusually sensitive to air pollution:** Plan strenuous outside activities when air quality is better
Unhealthy for Sensitive Groups	101-150	**Sensitive Groups:** Cut back or reschedule strenuous outside activities **Particle Pollution:** People with heart or lung disease (including diabetics), older adults, and children **Ozone:** Active children and adults and people with lung disease **Sulfur Dioxide:** Active children and adults with asthma **Carbon Monoxide:** People with heart disease and possibly fetuses and infants
Unhealthy	151-200	**Everyone:** Cut back or reschedule strenuous outside activities **Sensitive groups:** Avoid strenuous outside activities
Very Unhealthy	201-300	**Everyone:** Significantly cut back on outside physical activities **Sensitive groups:** Avoid all outside physical activities

EPA United States Environmental Protection Agency
EPA-452/F-04-001

Water Pollution

Water pollution is the second most imperative environmental concern next to air pollution. Freshwater resources all over the world are threatened not only by over exploitation and poor management but also by ecological degradation. Industrial growth, urbanization and the increasing use of synthetic organic substances have serious and adverse impacts on freshwater bodies.

What is Water Pollution?

Water pollution is an undesirable change in the state of water, contaminated with harmful substances. Water pollution refers to harmful substances released into surface or groundwater, either directly or indirectly.
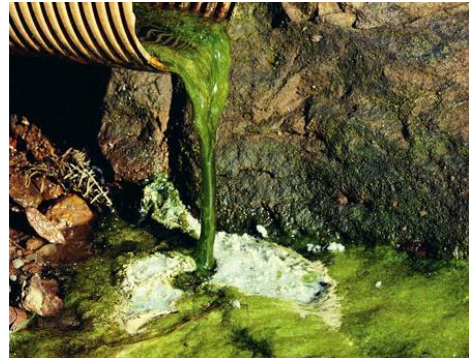
Causes of Water Pollution:

- Discharge of untreated waste into the water bodies. Untreated or inadequately treated municipal sewage is a major source of groundwater and surface water pollution.
- Dumping of industrial effluent, domestic waste water, agricultural run-off, and industrial effluents contain phosphorous and nitrogen.
- Fertilizer run-off, manure from livestock operations, which increase the level of nutrients in water bodies can cause eutrophication in the lakes and rivers and continue on to the coastal areas.
- Acidification of surface water, mainly lakes and reservoirs due to transport over long distance of air pollutants such as sulphur dioxide from power plants, other heavy industry such as steel plants, and motor vehicles.
- **Lead**: pipes, fittings, solder and the service connections of household plumbing systems contaminate the drinking water source.
- **Petrochemicals**: Petrochemicals contaminate the groundwater from underground petroleum storage tanks.
- Other heavy metals, from mining waste and tailings, landfills, or hazardous waste dumps.
- **Chlorinated solvents**: Metal and plastic effluents, fabric cleaning, electronic and aircraft manufacturing are often discharged and contaminate groundwater.
- Motor vehicle emissions increase levels of PAHs (polycyclic aromatic hydrocarbons) in urban surface water as much as 100 times higher than pre-urban conditions, poisoning aquatic wildlife and disturbing ecological systems.
- Other pollutants are detergents, insecticides, herbicides, petroleum, food processing, chlorinated solvents, etc.

Impacts of Water Pollution:

- Chemicals in drinking water causes problem to health and leads to water-borne diseases.
- **Eutrophication**: Excessive nutrients in the water body causes a dense growth of plant life, the decomposition of the plants depletes the supply of oxygen, leading to the death of animal life.
- **Fluoride**: Fluoride in the water is essential for protection against dental caries and weakening of the bones, but higher levels can have an adverse effect on health.
- **Arsenic**: High concentrations of this element may lead to arsenic skin lesions.
- Consumption of highly contaminated water can cause infections, diarrhoea, injury to the heart and kidneys, hepatitis, gastroenteritis, vomiting, stomach aches, etc.
- Toxins within water can harm aquatic organisms, thus breaking a link in the food chain.
- Fish foods coming from polluted water may cause severe health problems to humans.
- Erosion of soil into waterways causes flooding, especially with heavy rainfall.
- Birds that get into oil-contaminated water die from exposure to cold water and air due to feather damage.
- Other animals are also affected when they eat dead fish in contaminated streams.

Figure: Pollution of River Ganges

YOU CAN HELP!

- Refrain from throwing litter into streams, lakes, rivers, or seas.

- Just picking up waste and litter wherever it is spotted can go a long way to keeping debris and pollutants out of the water. Do your part by taking your own trash, other wastes and any you see to a nearby disposal facility.

- REFUSE disposable plastics. Plastic bags in the ocean are a well documented water pollutant. Avoid plastics very strictly.

- Oil is one of the largest pollutants of water in the world. Take steps to ensure you are not adding to this problem by repairing oil leaks in cars and machinery as soon as they are spotted. Clean up the residue and dispose of the used oils properly.

- Try using natural fertilizers and pesticides as far as possible, or if not, do not overuse them or over-water gardens and lawns.

- Actively conserve water by turning the tap off and fixing slow-flow taps.

- Use environmentally friendly household products like toiletries, soap-based household cleaning material, and washing powder as far as possible.

- Spreading awareness of water pollution is a big first step toward combating them.

- Join a group who are trying to stop pollution. Throw

Soil/Land Pollution

What is Soil/Land Pollution?

Soil pollution is the degradation of Earth's land surfaces often caused by human activities and their misuse of land resources. Soil pollution comprises the pollution of soils with materials, mostly chemicals that are out of place or are present at concentrations higher than normal which may have adverse effects on humans or other organisms.

Causes of Soil Pollution:

- Mining, metallurgy chemical industry and electroplating.
- Lead smelters storage battery.
- Industrial and other wastes as landfills.
- Unhealthy waste management techniques such as dumping of solid wastes in the long run get deposited to the soils of the surrounding area and pollute them by altering their chemical and biological properties.
- Wastes from heat treatment of metals, dismantling of electroplating shops, etc.
- Garbage dumping, especially plastics and other non-biodegradable substances.
- Chemical pesticides, chemical fertilizers and chemical herbicides.
- Unfavourable and harmful irrigation practices.
- Fuel leakages from automobiles that get washed away due to rain and seep into the nearby soil.

Effects of Soil Pollution:

- Chronic arsenic poisoning leads to a loss of appetite and weight, diarrhoea, alternating with constipation, gastro-intestinal disturbances, and sometimes skin cancer including leukaemia.
- Chronic cadmium poisoning due to mining and metallurgy industries affects the proximal tubules of kidney, causing formation of kidney stones.
- Lead poisoning can lead to severe mental retardation or death. Especially hazardous for young children causing developmental damage to the brain.
- Mercury from industrial wastes causes neurological problems and damages renal glomeruli (capillaries in the kidneys) and tubules.
- Cyanides from wastes from heat treatment of metals may cause rapid death.
- Decrease in soil fertility and therefore decrease in the soil yield.
- Loss of soil and natural nutrients present in it.
- Disturbance in the balance of flora and fauna residing in the soil.
- Increase in salinity of the soil, which makes it unfit for vegetation, thus making it useless and barren.
- Contaminate drinking water aquifer sources due to dumping of solid wastes.
- Foul smell due to industrial chemicals and gasses might result in headaches, fatigue, nausea, etc. in many people.
- Increased microbial activities: Microbial decomposition of organic wastes generate large quantities of methane besides many chemicals to pollute the soil and water flowing on its surface.
- When such solid wastes are hospital wastes they create many health problems.

YOU CAN HELP!

🍂 Forests and grasslands are an excellent binding material that keeps the soil intact and healthy. Grow and motivate others to grow more trees.

🍂 Reuse materials such glass containers, plastic bags, paper etc. at domestic levels rather than being disposed off and thus help in reducing solid waste pollution.

🍂 Organize an event on every "International Mother Earth Day" (April 22) in schools/colleges, churches, community, etc. to draw their attention on the gravity of the situation and to strategically evolve an action plan.

🍂 Cultivate the habit among children to sort out rubbish.

🍂 Organize a local clean-up with your friends and family.

🍂 Recovery of one tonne of paper can save 17 trees.

Noise Pollution

The unwanted sound is called noise. This unwanted sound can damage physiological and psychological health. Noise is measured in decibels (dB). A decibel is the standard for the measurement of noise. When noise is 45 decibels, no human being can sleep, and at 120 decibels the ear is in pain and hearing begins to be damaged at 85 decibels.

What is Noise Pollution?

Noise pollution is excessive, displeasing, human, animal or machine-created environmental noise that disrupts the activity or balance of human or animal life.
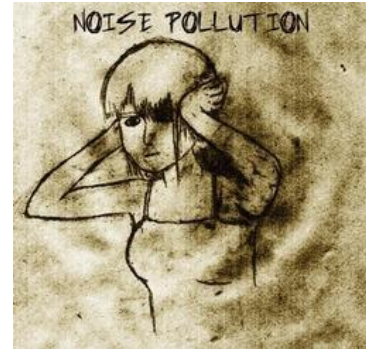
Sources of Noise Pollution:

- Road traffic creates noise pollution (automobiles, airplanes, trains etc.). With the ever-increasing number of vehicles on road, the sound caused by cars and exhaust system of autos, trucks, buses and motorcycles is the chief reason for noise pollution.
- Noise can be from factory, power tools and audio equipments. Though not a prime reason industries noise adds to the noise pollution.
- The noise from the construction of highways, city streets and buildings is a major contributor to the urban scene (usage of pneumatic hammers, air compressors, bulldozers, loaders, dump trucks and pavement breakers).
- Household equipments, such as vacuum cleaners, mixers, television, audio equipments are noisemakers in the house.
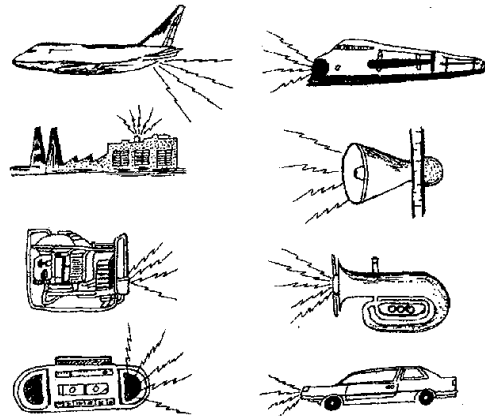
Table: Typical Noise Levels of some Point Sources

Source	Noise level dB(A)	Source	Noise level, dB(A)
Air compressors	95-104	Quiet garden	30
110 KVA diesel generator	95	Ticking clock	30
Lathe Machine	87	Computer rooms	55-60
Milling machine	112	Type institute	60
Oxy-acetylene cutting	96	Printing press	80
Pulveriser	92	Sports car	80-95
Riveting	95	Trains	96
Power operated portable saw	108	Trucks	90-100
Steam turbine (12,500 kW)	91	Car horns	90-105
Pneumatic Chiseling	118	Jet takeoff	120

Effects of Noise Pollution:

- Noise pollution can cause annoyance. Sometimes, even low levels of noise are irritating and can be frustrating and high volumes can be annoying.
- Very high levels of noise can make people wake from their sleep with a jerk and keep them awake or disturb their sleep pattern. This could make them irritable and tired the next day.
- Lack of concentration: Increased noise levels gives rise to a lack of concentration and accuracy at work and reduce one's productivity and performance.
- The noise of traffic or the loudspeakers of different types of horns divert the attention of the people working in offices.
- Noise cause aggression, hypertension, high stress levels, etc.
- Chronic exposure to noise may cause noise-induced hearing loss. Noise more than 50 dB can be very difficult to hear and interpret and cause deafness.
- Nervous system: It causes pain, ringing in the ears, feeling of tiredness, thereby affecting the functioning of human system.
- Physiological effects: The physiological features like breathing amplitude, blood pressure, heart-beat rate, pulse rate, blood cholesterol are affected.
- Damage to material: Buildings and materials may get damaged by exposure to infrasonic/ultrasonic waves and even get collapsed.
- On animals, noise can increase the risk of death by changing the delicate balance in predator or prey detection.
- Noise pollution damages the nervous system of animal. Animal looses the control of its mind. They become dangerous.
- Now it is proved that plants are also as sensitive as man. Noise pollution causes poor quality of crops.
- Decline in migratory birds to a habitat if it becomes noisy.

YOU CAN HELP!

🍃 Prohibition on the usage of loudspeakers in the habitat zones.

🍃 Reduce domestic noise from radio, tape records, television, mixers, washing machines, and cooking operation by their selective and judicious operation.

🍃 Regular servicing and tuning of vehicles will reduce the noise levels.

🌿 Speak at low voices enough for communication, thus excess noise levels can be reduced.

🌿 Organize human chain campaign against noise pollution with placards and banners with slogans against noise pollution.

Noise Awareness Movement of India

STOP HONKING - ENJOY THE SILENCE
QUIT HORN - SAVE ENVIRONMENT
AVOID NOISE NUISANCE - SAVE LIFE

HONK, if you think you are above GOD
Issued in Public Interest by: www.bollywoodhunts.com

Effects of Common Air Pollutants

RESPIRATORY EFFECTS

Symptoms:
- Cough
- Phlegm
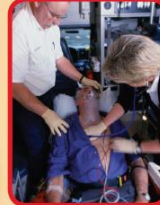- Chest tightness
- Wheezing
- Shortness of breath

Increased sickness and premature death from:
- Asthma
- Bronchitis (acute or chronic)
- Emphysema
- Pneumonia

Development of new disease
- Chronic bronchitis
- Premature aging of the lungs

How Pollutants Cause Symptoms
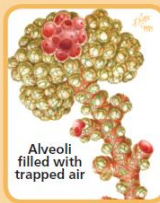
Alveoli filled with trapped air

Effects on Lung Function
- Narrowing of airways (bronchoconstriction)
- Decreased air flow

Airway Inflammation
- Influx of white blood cells
- Abnormal mucus production
- Fluid accumulation and swelling (edema)
- Death and shedding of cells that line airways

Airway lining
Mucus
White blood cell

Increased Susceptibility to Respiratory Infection

Normal

Lung with respiratory infection

CARDIOVASCULAR EFFECTS

Symptoms:
- Chest tightness
- Chest pain (angina)
- Palpitations
- Shortness of breath
- Unusual fatigue

Increased sickness and premature death from:
- Coronary artery disease
- Abnormal heart rhythms
- Congestive heart failure

How Pollutants May Cause Symptoms
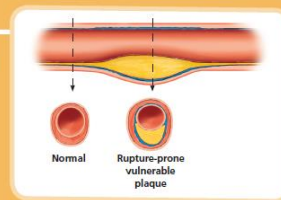
Normal heart rhythm

Abnormal heart rhythm

Effects on Cardiovascular Function
- Low oxygenation of red blood cells
- Abnormal heart rhythms
- Altered autonomic nervous system control of the heart

Vascular Inflammation
- Increased risk of blood clot formation
- Narrowing of vessels (vasoconstriction)
- Increased risk of atherosclerotic plaque rupture

Normal

Rupture-prone vulnerable plaque