

# Environmental Profile of Pakistan

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## Environmental issues

- Environmental issues are any such issues created due to human activities and cause harm to the environment.
- Environmental issues are interconnected, that means one issue accelerates the other. A variety of environmental problems now affect the entire world. As globalization continues, the local problems are transformed into international issues.



Some of the largest problems now affecting the world are:

- Pollution
- Global warming
- Hazardous wastes
- Smog
- Overpopulation
- Environmental degradation
- Energy crisis

## Definition of pollution

“When harmful substances contaminate the environment, it is called pollution. Pollution refers to the very bad condition of environment in terms of quantity and quality”



## **Types of pollution**

Types of pollution include the following:

- **Air pollution**
- **Water pollution**
- **Noise pollution**
- **Soil/Land pollution**
- **Radioactive pollution**

## **Air pollution**

- Air pollution includes all the contaminants found in atmosphere.
- These dangerous substances can be either in the form of gases or particles.
- Air pollution can be found both outdoors and indoors. Pollutants can be trapped inside buildings, causing indoor pollution that last for a long time.
- The sources of air pollution are both natural and human-based. Air is considered safe when it contains no harmful dust and gases.



## **Major air pollutants**

- Sulfur oxides (SO<sub>x</sub>)
- Nitrogen oxides (NO<sub>x</sub>)
- Carbon mono oxide (CO)
- Volatile organic compounds
- Particulate matter (PM)
- Toxic metals such as lead/mercury,
- Chlorofluoro carbons (CFCs)
- Ammonia (NH<sub>3</sub>)
- Odors such as from garbage, sewage and industrial processes,  
Radioactive pollutants
- Ground level ozone

Major sources of air pollution include the following:

- Industries
- Automobiles and domestic fuels
- High proportion of undesirable gases such as sulfur dioxide and carbon monoxide.
- Dust (e.g. cement dust, foundry dust and windblown solid dust)
- Mist
- Smoke
- Carbon black
- Aerosols

## Water pollution

- Water pollution is the contamination of water bodies (e.g. lakes, rivers, oceans and ground waters).
- Water pollution occurs when pollutants are discharged directly or indirectly into water bodies without adequate treatment to remove harmful compounds.
- Water pollution affects plants and organisms living in these bodies of water.



## **Point source**

Contaminants that enter a water way from a single, identifiable source, such as pipe or ditch. Examples of sources in this category include discharges from sewage treatment plant, a factory or a city storm drain.

## **Non point Sources**

Refers to diffuse a contamination that does not originate from a single discrete source. A common example is the leaching out of nitrogen compounds from fertilized agricultural lands. Nutrient runoff in storm water from sheet flow over an agricultural field or a forest are also cited as examples of NPS pollution.



- The specific contaminants leading to pollution in water include a wide spectrum of chemicals, pathogens, and physical or sensory changes such as elevated temperature and discoloration.
- While many of the chemicals and substances that are regulated may be naturally occurring (calcium, sodium, iron, manganese, etc.) the concentration is often the key in determining what is a natural component of water, and what is a contaminant.
- High concentrations of naturally-occurring substances can have negative impacts on aquatic flora and fauna. Oxygen-depleting substances may be natural materials, such as plant matter (e.g. leaves and grass) as well as man-made chemicals.
- Other natural and anthropogenic substances may cause turbidity (cloudiness) which blocks light and disrupts plant growth and clogs the gills of some fish species.

- Many of the chemical substances are toxic. Pathogens can produce waterborne diseases in either human or animal hosts. Alteration of water's physical chemistry includes acidity (change in pH), electric conductivity, temperature, and eutrophication.
- **Eutrophication** is an increase in the concentration of chemical nutrients in an ecosystem to an extent that increases in the primary productivity of the ecosystem. Depending on the degree of eutrophication, subsequent negative environmental effects such as anoxia (oxygen depletion) and severe reductions in water quality may occur, affecting fish and other animal populations.



## **WATER POLLUTANT GROUPS**

**1 Oxygen-depleting substances:** organic waste, used by aerobic microorganisms in presence of oxygen.

**2. Water soluble inorganic substances:** salts, acids, compounds of heavy metals. Acidity caused by industrial discharges (especially sulphur dioxide from power plants). Presence in soil (via polluted water) of these substances reduce agricultural harvest, as well as to arouse corrosion of the metals.

**3. Inorganic nutrients for plants:** water soluble nitrates, phosphates, which are promoters of eutrophication. Ammonia from food processing waste.

**4. Organic substances:** oil products, petrol, plastic, pesticides, solvents, detergents, etc.

## Noise pollution

Noise can be defined as unwanted sound.

**Or**

Disturbing or excessive noise that may harm the activity or balance of human or animal life. The sound is pleasant or not depends upon its loudness, duration, rhythm and the mood of person.

Causes of noise pollution

- Traffic noise
- Aircraft noise
- Noise from construction and civil engineering work
- Noise from industries
- Noise from other sources



## Soil pollution/ Land pollution

Soil pollution is defined as the buildup in **soils** of persistent toxic compounds, chemicals, salts, radioactive materials, or disease-causing agents, which have adverse effects on plant growth and animal health.

**Soil** is the thin layer of organic and inorganic materials that covers the Earth's rocky surface.



Soil pollution can be caused by the following:

- Accidental spills and acid rain (which is caused by air pollution)
- Intensive farming, deforestation and genetically modified crops
- Nuclear wastes and Industrial accidents
- Landfill and ill legal dumping
- land erosion
- Agricultural practices such as application of pesticides, herbicides and fertilizers
- Mining and other industries
- oil and fuel dumping, buried wastes and disposal of coal ash
- Drainage of contaminated surface water into soil.

One fourth area is covered by land. Land is a earth which occupied by people for shelter, occupation etc.

Causes of land pollution include the following:

- Municipal solid waste
- Industrial waste and hazardous waste
- Burning open dumps and forest fires
- Household garbage
- Urbanization and concentration of population

## **Global warming**

- Global warming refers to continuing rise in the average temperature of Earth's climate system. Since the early 20<sup>th</sup> century, the global and sea surface temperature has increased about 0.8°C. Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850. Emission of greenhouse gases grew 2.2% per year between 2000 and 2010, compared with 1.3% per year from 1970 to 2000.
- Global warming is called the greenhouse effect because the gases that are gathering above the earth make the planet comparable to a greenhouse. By trapping heat near the surface of the earth, greenhouse effect is warming the planet and threatening the environment.

## **Causes of global warming**

- Carbon dioxide emissions from fossil fuel burning power plants
- Carbon dioxide emissions from burning gasoline for transportation
- Methane emissions from animal waste, agriculture such as rice paddies
- Deforestation

## **Causes of greenhouse**

### **Deforestation**

Cutting down of trees, thus, leads to an increase in the carbon dioxide level in the atmosphere, eventually enhancing the greenhouse effect

### **Burning of fossil fuels**

Greenhouse gases can also be released into the atmosphere due to burning of fuels, oil, coal and gas.

### **Population growth**

With increase in in population the needs and wants of people increase which consequently increases deforestation, manufacturing and industry processes.

## **Greenhouse gases**

- Water vapors
- Carbon dioxide
- Methane
- Nitrous oxide
- Chlorofluorocarbons (CFCs)

- **Weather:** Weather is the condition of the atmosphere at a given place or time. It is very dynamic as it may change several times even in a day.
- **Season:** Average weather conditions, showing uniformly over a period of few months may be described as a season.
- **Climate:** Climate is the average weather condition or atmospheric conditions of an area over a considerable period. Thus, the climate is the same over large areas and it does not change often.

## **Climate change**

- Climate change is a change in the statistical distribution of weather over periods of time that range from decades to millions of years. It can be a change in the average weather or a change in the distribution of weather events around an average.
- Climate change is a significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. It may be a change in average weather conditions or in the distribution of weather around the average condition

## **Causes of climate change**

- Increase greenhouse gases (emission from burning fossil fuels- coal, oil and gas)
- Deforestation
- Increasing population (More people more CO<sub>2</sub>)
- The wetlands release methane, a greenhouse gas

## **Effects of climate change**

- Migrating birds are forced to change their time and place of migration
- Melting of glaciers will lead to higher sea level, which cause floods and put many low elevation regions at risk of disappearing under water
- New and widespread diseases because of warm climate
- Droughts, heat waves, extreme winter and storms

## Smog

- Smog is a kind of air pollution, originally named for the mixture of smoke and fog in the air. It has yellowish or blackish color and also called as ground level ozone. It is a mixture of pollutants in the atmosphere including nitrogen oxides and volatile organic compounds that combine with sunlight to form ozone. Smog also refers to hazy air that makes breathing difficult.
- **Smog:** is a mixture of smoke and fog
- **Fog:** are suspended water droplets in air

- **Smoke:** is a collection of solid and liquid particulates and gases emitted when a material undergoes combustion or pyrolysis
- **Mist:** are also water droplets in air but it occurs when hot air passes through cool condition and suddenly change into water droplets. Mist is less dense than fog.

## **Causes of Smog**

- Emissions from industries, automobiles, trains and air planes
- Volcanic activity
- Forest fires

## **Photochemical smog and industrial smog**

- **Photochemical smog** is a mixture of pollutants that form when nitrogen oxides and volatile organic compounds react to sunlight, creating a haze that is common over cities.
- **Industrial smog** contains two primary compounds; sulfur dioxide and particulate matter which include dust and soot from burning coal for heat and fuel.

## **Effects**

- It is harmful to humans, animals, plants and the nature as a whole.
- Effects on human health
- Causes eye irritation
- Lung related diseases
- Skin diseases
- Asthama
- The ground level ozone present in the smog also inhibits plant growth and causes immense damage to crop and forests

## **Policy for smog in Pakistan**

- The Punjab government has been notified a smog policy in the province and six air-monitoring stations made functional to determine how much India is contributing to smog in Pakistan.

## **Over population**

- Excessive population of an area to the point of overcrowding.

## **Reasons of over population**

- Decline in the death rate and rise in birth rate due to public health and good hygiene
- Migration
- Lack of education

## **Impacts of over population**

- The problem of food
- The problem of unemployment and crime
- Problem of education

- The housing problem
- Problem of pollution
- Problem of clean water
- The problem of poverty

### **Solutions**

- Creating awareness through Tv, Radio, newspaper and social media.
- Dealing with consequences for overpopulation
- Conservative use of water and energy
- Recycling
- Continue to improve resource efficiency and pollution control so that standard of living can rise without negative impacts
- Keep human population to numbers that are sustainable

## **Hazardous waste**

- Hazardous waste is waste with properties that make it dangerous or potentially harmful to human health or environment.
- Hazardous wastes can be liquids, solids, contained gases or sludge. They can be the products of manufacturing processes or simply discarded commercial products like cleaning fluids or pesticides.

- **Characteristics of hazardous wastes**

- Ignitable
- Corrosive
- Toxic (harmful or fatal when ingested or absorbed)
- Reactive (unstable under normal conditions)

- **Main classes of hazardous wastes**

- Heavy metals (lead, zinc)
- Synthetic organic compounds (DDT, Dioxin)
- Petroleum products (Oil, Grease, Gasoline)
- Acids (hydrochloric acid or sulfuric acid)
- Biological substances (bacteria)
- Radioactive materials (medical, military)

## **Major types of hazardous**

The types of hazardous can be classified as

### **Cultural hazardous**

Cultural hazardous are such as unsafe working conditions, smoking, poor diet, drugs.

### **Chemical hazardous**

Hazardous chemicals cause harm by:

- Being flammable or explosive
- Irritating or damaging the skin or lungs
- Interfering with or preventing oxygen uptake and distribution

## **Biological hazardous**

Approximately 31% of the 56 million deaths in 1999 were due to infectious and parasitic diseases. The leading cause of death in this category are the acute respiratory infections e.g., pneumonia, tuberculosis and influenza.

## **Physical hazardous**

Natural disasters including hurricanes, floods, earthquakes, landslides and volcanic eruptions take a toll of human life and property each year.

## **Environmental degradation**

Deterioration of the environment through depletion of resources such as air, water and soil; destruction of ecosystems and extinction of wildlife.