

6.4 ACID RAIN AND ITS IMPACTS

- It occurs due to the presence of certain pollutants in the atmosphere.
- It can be caused due to combustion of fossil fuels or erupting volcanoes or rotting vegetation which release sulphur dioxide and nitrogen oxides into the atmosphere.
- It is a known environmental problem that can have serious effect on human health, wildlife, agriculture and aquatic species.
- The elevated levels of hydrogen ions (i.e. low pH) rain can have harmful effects on plants, aquatic animals, and infrastructure.
- It is caused by emissions of sulphur dioxide and nitrogen oxide, which react with the water molecules in the atmosphere to produce acids.
- Nitrogen oxides can also be produced naturally by lightning strikes and sulphur dioxide is produced by volcanic eruptions.
- The chemicals in acid rain can cause paint to peel, corrosion of steel structures, and erosion of stone statues.

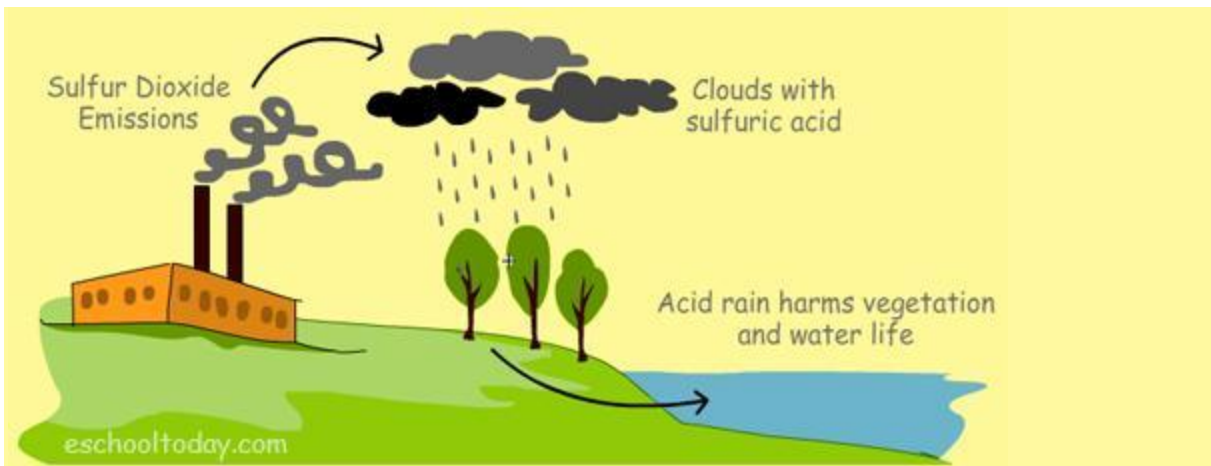
What are the effects of air pollution?

Acidification:

Chemical reactions involving air pollutants can create acidic compounds which can cause harm to vegetation and buildings.

Sometimes, when an air pollutant, such as sulfuric acid combines with the water droplets that make up clouds, the water droplets become acidic, forming acid rain.

When acid rain falls over an area, it can kill trees and harm animals, fish, and other wildlife.



It destroys the leaves of plants.

When acid rain infiltrates into soils, it changes the chemistry of the soil making it unfit for many living things that depend on the soil as a habitat or for nutrition.

It also changes the chemistry of the lakes and streams that the rainwater flows into, harming fish and other aquatic life.

Eutrophication:

Rain can carry and deposit the Nitrogen in some pollutants on rivers and soils.

This will adversely affect the nutrients in the soil and water bodies.

This can result in algae growth in lakes and water bodies, and make conditions for other living organism harmful.

Ground-level ozone:

Chemical reactions involving air pollutants create a poisonous gas ozone (O₃).

Gas Ozone can affect people's health and can damage vegetation types and some animal life too.

Particulate matter:

Air pollutants can be in the form of particulate matter which can be very harmful to our health.

The level of effect usually depends on the length of time of exposure, as well the kind and concentration of chemicals and particles exposed to.

Short-term effects include irritation to the eyes, nose and throat, and upper respiratory infections such as bronchitis and pneumonia.

Others include headaches, nausea, and allergic reactions.

It can aggravate the medical conditions of individuals with asthma and emphysema.

Long-term health effects can include chronic respiratory disease, lung cancer, heart disease, and even damage to the brain, nerves, liver, or kidneys.

Continual exposure to air pollution affects the lungs of growing children and may aggravate or complicate medical conditions in the elderly.

Effects of acid rain on humans:

- It can cause heart and lung problems including asthma and bronchitis in human beings.
- The environmental effect of acid rain has been the loss of aquatic life like fishes etc.
- It may remove soil nutrients such as calcium and magnesium from soils in high elevation forests.

Effects of acid rain on agriculture:

- It affects plants directly and decreases soil quality to reduce yields from agriculture.
- Its effects are particularly severe in locations near sources of sulphur dioxide and nitrogen oxides.
- In the United States, about two-thirds of sulphur dioxide and one-quarter of nitrogen oxides come from power generation plants burning fossil fuels, while the rest is from industrial and transportation sources.

Air pollution prevention, monitoring and solution.

This is why prevention interventions are always a better way of controlling air pollution.

These prevention methods can either come from government (laws) or by individual actions.

Authorities read them regularly to check the quality of air.

Government (or community) level prevention:

Governments throughout the world have already taken action against air pollution by introducing green energy.

Some governments are investing in wind energy and solar energy, as well as other renewable energy, to minimize burning of fossil fuels, which cause heavy air pollution.

Governments are also forcing companies to be more responsible with their manufacturing activities, so that even though they still cause pollution, they are a lot controlled.

Car manufacturing companies are also building more energy efficient cars, which pollute less than before.

Individual Level Prevention:

Encourage your family to use the bus, train or bike when commuting. If we all do this, there will be fewer cars on the road and less fumes produced.

Use energy (light, water, boiler, kettle and fire woods) wisely. This is because lots of fossil fuels are burned to generate electricity, and so if we can cut down the use, we will also cut down the amount of pollution we create.

Recycle and re-use things. This will minimize the dependence of producing new things.