



ACID RAIN AND IT'S ENVIRONMENTAL IMPACTS

CASE STUDY/INSIGHT

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Acid rain is a broad term that includes any form of precipitation with acidic components, such as sulphuric or nitric acid that fall to the ground from the atmosphere in wet or dry forms. Acid rain results when sulphur dioxide (SO₂) and nitrogen oxides (NO_x) are emitted into the atmosphere and transported by wind and air. The SO₂ and NO_x react with water, oxygen and other chemicals to form sulphuric and nitric acids. These then mix with water and other materials before falling to the ground.

The major sources of SO₂ and NO_x in the atmosphere are:

- Burning of fossil fuels to generate electricity (2/3rd of SO₂ and 1/4th of NO_x in the atmosphere come from electric power generators)
- Vehicles and heavy equipment.
- Manufacturing, oil refineries and other industries.

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In general, the Acidity and Alkalinity of a substance are measured on a pH scale. The acid rains usually have a pH between 4.2 and 4.4 creating detrimental effects to the environment. The ecological effects of acid rains are most clearly seen in aquatic environments, such as streams, lakes, and marshes where it can be harmful to fishes and other aquatic life. . As it flows through the soil, acidic rain water can leach aluminium from soil clay particles and then flow into streams and lakes.

In the aquatic ecosystem, the young of most species are more sensitive to environmental conditions than adults. At pH 5, most fish eggs cannot hatch. At lower pH levels, some adult fishes die. Some acidic lakes have no fish at all.

Dead or dying trees are a common sight in areas effected by acid rain. It also removes minerals and nutrients from the soil that are required for trees and plants to grow. Many forests, streams, and lakes that experience acid rain don't suffer ill effects as the soil in those areas can buffer the acid rain by neutralizing the acidity in the rainwater flowing through it. This capacity depends on the thickness and composition of the soil and the type of bedrock underneath.

Walking in acid rain or even swimming in a lake affected by acid rain, is not very dangerous to humans. However, when the pollutants SO₂ and NO_x react in the atmosphere and form fine sulphate and nitrate particles, they would cause heart disease and lung dysfunction (such as breathing difficulties for people with asthma).