

# REASONS AND NEGATIVE CONSEQUENCES OF ACID RAIN ON CHILDREN'S HEALTH

**Amira Alirizoyeva**

*English Education 122, Samarkand branch of Kimyo International University in Tashkent*

**Takhmina Akaramova**

*Academic Research and Writing*

It is often said that rain is something refreshing and beneficial to the environment, but, actually, not all types of rain are good. Acid rain is a type of rain which contains chemical substances which are harmful for the environment. According to Scottish chemist Robert Angus Smith it is created by emissions of sulfur dioxide and nitrogen oxide which reacts with the water molecules in the atmosphere to produce acids (Patricia et al., 1983). In addition, acid rain can be detrimental to flora and fauna as it leaches aluminum (Arcadia et al., 2017). Various researchers (Christopher Lehmann, 2013; David Gay) have evaluated that acid deposition has significant adverse effects on lakes and streams. Scientific concerns have also been voiced over potentially significant effects on human health. It has been estimated that around 550 premature deaths each year occur due to acid rain. The paper is structured as follows: the first section presents the causes and places damaged by acid rain, focusing on the current limited knowledge regarding the student experience; the second part presents the harmful effects and methods to avoid acid rain, and the final section considers the kind of pollution which can result in formation of acid rain.

To begin with, to understand and estimate the destroying strength of acid rain it is necessary to see its causes and places affected by it. The term "acid rain" was coined in 1872 by Scottish chemist Robert Angus Smith. He studied the composition of rainwater near the large industrial cities of Foggy Albion. The result of his work was the book "Air and rain: the beginning of chemical climatology." In the 1950s, American scientists began their research on this phenomenon. In the 1960s and early 1970s, acid rain was recorded in Western Europe and eastern North America, reports Live Science (Igor, 2018). Acid rain can be classified as: Dry acid rain or wet acid rain. Both the wet and dry forms of acid rain can be carried away by the wind and travel a long distance before being deposited. Being acidic means it contains elevated levels of hydrogen ions. It majorly affects aquatic creatures and infrastructures. Many buildings and monuments have also been damaged by acid rain since the acid damages calcium carbonate stone. For instance, the Taj Mahal, one of the world's seven wonders, is severely damaged by acid rain. Agra has various factories that generate sulfur and nitrogen oxides into the environment. The deterioration of this wonderful monument is caused by the production of calcium sulphate. The copper Statue of Liberty has also shown damages due to the continuous impact of acid rain and oxidation for over 30 years and is thus becoming green. It abolishes the nutrients

that plants require for growth and life. Acid precipitation influences agriculture since it changes the soil's makeup. Because it changes the chemical makeup of the water, it is hazardous to the survival of the marine ecology and produces pollution. Acid precipitation also causes corrosion of water pipelines, such as iron, lead, and copper into the beverage. Thus, It causes harm to structures and monuments constructed of stone. (Valerie et al., 1983.).

Acid Rain has alarmingly negative effects which can be described as: It speeds up the decay of building materials and the paint on them is more likely to peel. The acidity also wears down stone statues, making them appear older and reducing their value. Acid Rain also releases excess aluminum into the soil around trees, which makes it difficult for them to absorb the water. For example, in Germany, there is a place called the "Black Forest", which received its name because acid rain caused the trees to drop their needles with the result that they simply turned to black trunks and branches. (Kavles et al., 2019). It may not seem as though Acid Rain is much of an issue, but it can cause disasters, more than that we can even imagine. Rotting vegetation is another issue which frequently generates a great deal of heated debate. It abolishes the nutrients that plants require for growth and life. Acid precipitation influences agriculture since it changes the soil's makeup. Because it changes the chemical makeup of the water, it is hazardous to the survival of the marine ecology and produces pollution. Acid precipitation also causes corrosion of water pipelines, such as iron, lead, and copper into the beverage. It causes harm to structures and monuments constructed of stone.

The biggest step that you can take to prevent acid rain is to decrease your energy consumption. Close the lights when you leave the room and turn off computers and televisions when you're not using them. Whenever you're not using an electrical appliance, simply shut it off to conserve energy. Another large consumer of energy is your home's heating and cooling system. Make sure to use your air conditioning only when you really need it. Turn down your heaters when you leave the house. It will cost you less and save more energy. Technology is constantly being produced to detect the amounts of pollutants like sulfur dioxide. A camera created by the Universidad Carlos III de Madrid Laboratorio del Infrarrojo could help this problem. Experts have pointed out that it could work alongside an alarm system to signal the leak of specific gasses. Some technology has the ability to detect compounds in real time, even if the actual device is hundreds of meters away (George et al., 1983).

It goes without saying that if you're exposed to high concentrations of nitric and sulfuric acid -- especially over time -- it can cause these problems: Irritation to eyes, skin, and mucous membranes can come from contact with one or both acids. Fluid in lungs, or pulmonary edema, can happen if you breathe in nitric acid. Dental erosion. Both acids can wear down the enamel on your teeth. (Stuart et al., 1983). The compounds released from burning fossil fuels (before they turn into acids) can cause: Respiratory illnesses like chronic bronchitis, pneumonia, and asthma. (Acid rain chemicals can make existing respiratory ailments worse, too.) Cardiovascular

problems, such as worsening existing heart disease. Lower birth weight, which might affect a child's growth and development. Lung cancer. Pollution can cause cell mutations that can become cancerous. Acidosis is also one of the dangerous diseases which is caused by an overproduction of acid that builds up in the blood or an excessive loss of bicarbonate from the blood or by a buildup of carbon dioxide in the blood that results from poor lung function or depressed breathing. Sulfur dioxide and nitrogen oxides are not primary greenhouse gasses that contribute to global warming, one of the main effects of climate change; in fact, sulfur dioxide has a cooling effect on the atmosphere. But nitrogen oxides contribute to the formation of ground-level ozone, a major pollutant that can be harmful to people. (Hilliard et al., 1988). Both gasses cause environmental and health concerns because they can spread easily via air pollution and acid rain. Acid Rain caused due to natural reasons cannot be stopped. But there are ways following which we can avoid the same, caused due to man-made reasons. The ways by which acid rain can be avoided are by the use of limestone by which people can repair the damages caused by acid rain to lakes, rivers, brooks, and other water sources. By adding lime into the acidic surface also we can avoid acid rain as water balances the acidity. Use of hybrid vehicles with negligible NO<sub>2</sub> emissions is also a way out. Besides fossil fuels, there is a wide range of substitutable energy sources that can generate electrical power. These include wind energy, solar energy, geothermal energy, nuclear power, and hydro energy. Using these energy sources can offer effective electrical power alternatives. Instead of using fossil fuels, use of natural gas, fuel cells and batteries can also substitute use of fossil fuels.

Our animal and plant life should be of paramount importance to us. As you can see, there are many ways to clean our air. We need to make efforts on a war footing to reduce the phenomenon of acid rain in order to avoid inflicting colossal damage to the environment. To end this, we must reduce our release of toxic gas into the atmosphere.

#### REFERENCES:

1. Arcadia, T. (2017, August 22). *15 key facts and statistics about acid rain*. Blog. Retrieved February 10, 2023, from <https://blog.arcadia.com/15-key-facts-and-statistics-about-acid-rain/>
2. Nunez, C. (2019, April 8). *Acid rain, explained*. National Geographic. Retrieved February 10, 2023, from <https://www.nationalgeographic.co.uk/2019/03/acid-rain-explained>
3. Regens, J. (1989). *The Acid Rain Controversy*. University of Pittsburgh Press.
4. Robert, G., Friedman, Rosina, Bierbaum, Patricia, Catherwood, Stuart, Diamond, George Hoberg, & Valerie. (1983). The Acid Rain Controversy: The Limits of Confidence. *The American Statistician*, 37, 385–394. <https://doi.org/https://doi.org/10.2307/2683501>

5. Rothschild, R. (2019). 1. *Poisonous Skies*, 9–35.  
<https://doi.org/10.7208/chicago/9780226634852.003.0002>

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