

A REVIEW ON AIR POLLUTION

Er. Swati Soni¹, Er. Chetan kumar², Er. Shaitan Singh Rawat³, Er. Yugal Kishor Prajapat⁴

¹Assistant Professor, Department of Civil Engineering, SWIET, Ajmer Rajasthan., India

²H.O.D, Department of Civil Engineering, SWIET, Ajmer Rajasthan., India

³Assistant Professor, Department of Civil Engineering, SWIET, Ajmer Rajasthan., India

⁴Assistant Professor, Department of Architecture, SWIA, Ajmer Rajasthan., India

ABSTRACT

Air Pollution emissions have been a leading threat to the world, as the world has become more and more industrialized over the past century. The air we breathe in use to be pure and fresh. But, due to increasing industrialization and concentration of poisonous gases in the environment the air is getting more and more toxic day by day. Also, these gases are the cause of many respiratory and other diseases. Moreover, the rapidly increasing human activities like the burning of fossil fuels; deforestation is the major cause of air pollution. The fossil fuel, firewood, and other things that we burn produce oxides of carbons which got released into the atmosphere. Earlier there happens to be a large number of trees which can easily filter the air we breathe in. But with the increase in demand for land, the people started cutting down of trees which caused deforestation. That ultimately reduced the filtering capacity of the tree. Moreover, during the last few decades, the numbers of fossil fuel burning vehicle increased rapidly which increased the number of pollutants in the air. The air pollution has many bad effects on the health of people. It is the cause of many skins and respiratory disorder in human beings.

KEY WORDS: *Air Pollution, Fossil Fuels, Environment, Deforestation, Air Quality.*

1. INTRODUCTION

Air pollution may be described as contamination of the atmosphere by gaseous, liquid, or solid wastes or by-products that can endanger human health and welfare of plants and animals, attack materials, reduce visibility, or produce undesirable odours. Although some pollutants are released by natural sources like volcanoes, coniferous forests, and hot springs, the effect of this pollution is very small when compared to that caused by emissions from industrial sources, power and heat generation, waste disposal, and the operation of internal combustion engines. Fuel combustion is the largest contributor to air pollutant emissions, caused by man, with stationary and mobile sources equally responsible. The air pollution problem is encountered outdoor as well as indoor.

According to the world health organization (WHO), outdoor air pollution is classified into four main categories: particulate matter, ozone, nitrogen dioxide, and sulphur dioxide. Additionally, air pollution is further divided into primary and secondary pollutants. Primary pollutant are released directly into the atmosphere from a source, where secondary pollutant occur as a result of complex chemical reactions taking place from two pollutant reacting with each other. In this industrial age, air pollution cannot be eliminated completely, but steps can be taken to reduce it. The government has developed, and continues to develop, guidelines for air quality and ordinances to restrict emissions in an effort to control air pollution. On an individual level, we can reduce our contribution to the pollution problem by carpooling or using public transportation. Additionally, buying energy efficient light bulbs and appliances or otherwise reducing our electricity use will reduce the pollutants released in the production of electricity, which creates the majority of industrial air pollution.

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0-50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51-100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201-300	Health alert: everyone may experience more serious health effects.
Hazardous	> 300	Health warnings of emergency conditions. The entire population is more likely to be affected.

2. Causes of air pollution

2.1 The burning of fossil fuels

Sulphur dioxide emitted from the combustion of fossil fuels like coal, petroleum and other factory combustibles are one the major cause of air pollution. Pollution emitting from vehicles including trucks, jeeps, cars, trains, airplanes cause an immense amount of pollution. We rely on them to fulfil our daily basic needs of transportation. But, their overuse is killing our environment as dangerous gases are polluting the environment. Carbon Monoxide caused by improper or incomplete combustion and generally emitted from vehicles is another major pollutant along with Nitrogen Oxides that is produced from both natural and man-made processes.

2.2 Industry

In many countries, power generation is a leading source of air pollution. Coal-burning power plants are a major contributor, while diesel generators are a growing concern in off-grid areas. Industrial processes and solvent use, in the chemical and mining industries, also pollute the air. Policies and programmes aimed at increasing energy efficiency and production from renewable sources have a direct impact on a country's air quality. At the moment, 82 countries out of 193 have incentives that promote investment in renewable energy production, cleaner production, and energy efficiency and pollution control.

2.3 Transportation

Emits a series of air pollutants (gases – including carbon monoxide, sulphur oxides, and nitrogen oxides - and particulate matter) through the tailpipe gases due to internal combustion of various fuels (usually gasses such as oxides of carbons, of sulphur, of nitrogen, as well as organic chemicals as PAHs)

2.4 Construction and Demolition activities

Pollute the air with various construction materials. Of special threat is the demolition of old buildings which may contain a series of banned chemicals such as PCBs, PBDEs, asbestos.

2.5 Coal Power Plants

When burning coal this may emit a series of gases as well as particulate matter with metals (such as As, Pb, Hg) and organic compounds (especially PAHs);

2.5 Landfill disposal practices

Usually generate methane due to the intensification of natural microbial decaying activity in the disposal area;

3. EFFECTS OF AIR POLLUTION

3.1 Respiratory and heart problems

The effects of air pollution are alarming. They are known to create several respiratory and heart conditions along with Cancer, among other threats to the body. Several million are known to have died due to direct or indirect effects of Air pollution. Children in areas exposed to air pollutants are said to commonly suffer from pneumonia and asthma.

3.2 Global warming

Global warming occurs when carbon dioxide (CO₂) and other air pollutants and greenhouse gases collect in the atmosphere and absorb sunlight and solar radiation that have bounced off the earth's surface. Normally, this radiation would escape into space—but these pollutants, which can last for years to centuries in the atmosphere, trap the heat and cause the planet to get hotter. That's what's known as the greenhouse effect.

3.3 Acid rain

Sulphur dioxide (SO₂) and nitrogen oxides (NO_x) released into the air by fossil-fuel power plants, vehicles and oil refineries are the biggest cause of acid rain. Two thirds of sulphur dioxide and one fourth of nitrogen oxide found in the atmosphere come from electric power generators. Acid rain is caused by a chemical reaction that begins when compounds like sulphur dioxide and nitrogen oxides are released into the air. These substances can rise very high into the atmosphere, where they mix and react with water, oxygen, and other chemicals to form more acidic pollutants, known as acid rain.

3.4 Eutrophication

Eutrophication, the process of accumulation of nutrients, including nitrogen, in water bodies, often results from air pollution. Nutrient overloads in aquatic ecosystems can cause algae blooms and ultimately a loss of oxygen, and of life. As ecosystems are impacted, so is the biological diversity. Concentrations of nitrogen and phosphorus provokes an enrichment of water by nutrient salts that cause structural changes to the ecosystem. The visual ones are massive production of algae and aquatic plants. The green coloured algae is very common in lakes and ponds, and it is only caused due to this reaction of air pollution.

3.5 Effect on wildlife

Just like humans, animals also face some devastating effects of air pollution. Toxic chemicals present in the air can force wildlife species to move to a new place and change their habitat. The toxic pollutants deposit over the surface of the water and can also affect sea animals.

3.6 Depletion of the ozone layer

Ozone depletion is the term commonly used to describe the thinning of the ozone layer in the stratosphere. Ozone depletion occurs when the natural balance between the production and destruction of ozone in the stratosphere is tipped in favour of destruction. Ozone-depleting substances containing chlorine include chlorofluorocarbons (CFCs), carbon tetrachloride, methyl chloroform and hydro chlorofluorocarbons (HCFCs). Holon's, methyl bromide and hydro bromofluoro carbons (HBFCs) are ODSs that contain bromine.

THE IMPACTS OF WORSENING AIR POLLUTION ARE MANY....

HEALTH



Indoor and outdoor air pollution is **linked to 7 million premature deaths** worldwide annually.

CLIMATE



Some air pollutants affect climate change and **accelerate Arctic warming** and glacial melt.

WATER



Air pollution **affects rainfall patterns**, storm intensities, and regional weather patterns such as the monsoon.

ENERGY



Haze and dust from air pollution can **reduce solar yields** by as much as 25%.

FOOD



Air pollution **reduces global crop yields** – up to 15% for wheat and soy and 5% for maize.

4. Solutions for Air Pollution

4.1 Use public mode of transportation

Public transportation helps increase the productivity of labour by reducing travel time and out-of-the-pocket costs of commuters in congested areas". Public transportation also benefits those not using it because it helps reduce energy consumption, greenhouse gases and other pollutants. Encourage people to use more and more public modes of transportation to reduce pollution. Also, try to make use of carpooling. If you and your colleagues come from the same locality and have same timings you can explore this option to save energy and money.

4.2 Emphasis on clean energy resources

Renewable energy resources are alternative to fossil fuels like coal, oil, and gas. Options like solar energy, wind, hydropower, and geothermal are becoming more and more popular as their reduced impact on the environment and increasingly attractive economics turn heads in the energy industry.

4.3 Use energy efficient devices

CFL lights consume less electricity as against their counterparts. They live longer, consume less electricity, lower electricity bills and also help you to reduce pollution by consuming less energy.

4.4 Understand the concept of Reduce, Reuse and Recycle

Do not throw away items that are of no use to you. In-fact reuse them for some other purpose. For e.g. you can use old jars to store cereals or pulses.

5. CONCLUSION

Earlier the air we breathe in use to be pure and fresh. But, due to increasing industrialization and concentration of poisonous gases in the environment the air is getting more and more toxic day by day. Also, these gases are the cause of many respiratory and other diseases. Moreover, the rapidly increasing human activities like the burning of fossil fuels, deforestation is the major cause of air pollution. So we have to think the solutions for air pollution that how can we control and reduce it for our healthy environment. This paper gives the possible solutions for controlling the air pollution and also gives the causes of air pollution.

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