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Atmospheric Pollution and Global Warming: An Analysis

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ABSTRACT

The paper focuses on the presence of any solid, liquid or gaseous substance including noise and radioactive radiation in the atmosphere. Raises healthcare costs due to increased disease burden. Atmospheric pollution has a serious impact on human health. The paper reveals Greenhouse gases, such as carbon dioxide, methane, and nitrous oxide, trap heat in the Earth's atmosphere, leading to global warming. Global warming has occurred faster than any other climate change recorded by humans and so is of great interest and importance to the human population.

Keywords: Atmospheric, pollution, dinitrogen, sulphur, tropospheric, carbon, dioxide, gaseous and air

INTRODUCTION

The atmospheric pollution covers the contamination of the air by chemical, physical, or biological agents, leading to severe health, economic, and developmental consequences. Air Pollution is the contamination of the atmosphere with harmful substances that can adversely affect human health, ecosystems, and climate. Atmospheric pollution is the contamination of air by chemical, physical, or biological agents that alter its natural composition. It enhances the respiratory and cardiovascular diseases, leading to premature deaths and reduced life expectancy. The greenhouse effect is caused by the ability of atmospheric gases such carbon dioxide, methane, nitrous oxide (N2O).

Environmental pollution is the effect of undesirable changes pollution, is known as pollutant. Pollutants can be WAL animals and human beings. A substance, which cause liquid or gaseous substances present in greater concentration than in natural abundance and produced due to human activities or due to natural requires nearly 12-15 times more air than the food. So, even small amounts of pollutants in the air become significant compared to similar levels present in the food. "Pollution has widespread consequences on human and environmental health, having systematic impact on social and economic systems. In 2019, pollution killed approximately nine million people worldwide (about one in six deaths that year); about three-quarters of these deaths were caused by air pollution (Dickie, Gloria 2022)

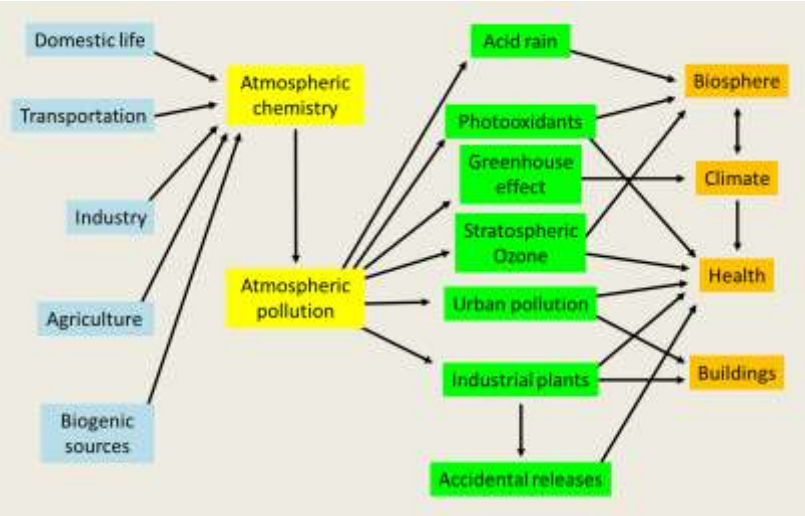
Pollutants can be degradable, like discarded vegetables which rapidly break down by natural processes. On the other hand, pollutants which are slowly degradable remain in the environment in an unchanged form for many decades. For example, substances such as dichloride phenyltrichloroethane (DDT), plastic materials, heavy metals, many chemicals, nuclear wastes etc., once released into the environment are difficult to remove. These processes and are harmful to living organisms pollutants cannot be degraded by natural in a sported by air or water or are dumped into In the process of environmental pollution. Pollutants originate from a source and get the soil by human beings. "Key applications include greenhouse gas monitoring, air quality and pollution control, weather prediction and meteorology, energy and emissions, sustainable energy development, and public health and toxicology. Green atmospheric chemistry research prioritizes the sustainable, safe, and efficient use of chemicals, which led to government regulations minimizing the use of harmful chemicals like CFCs and DDT" (Anastas, Paul 2018)

The atmosphere that surrounds the earth is not of the same thickness at all heights. There are concentric layers of air or regions and each of atmosphere in which the human beings layer has different density. The lowest region along with other organisms live is called troposphere. It extends up to the height of between 10 and 50 km above sea level lies - 10 km from sea level. Above the troposphere. Stratosphere, Troposphere is a turbulent, dusty zone containing air, much water vapour and clouds. This is the region of strong air movement and cloud formation. The stratosphere, on the other hand, contains dinitrogen, dioxygen, ozone and little water vapour.

Atmospheric pollution is generally studied as tropospheric and stratospheric pollution. Harmful ultraviolet (UV) radiations from prevents about 99.5 per cent of the sun's the presence of ozone in the stratosphere protecting humans and other animals from it's reaching the earth's surface and thereby effect. "Ozone in the troposphere is a greenhouse gas, and as such contributes to global warming. It is the third most important greenhouse gas after CO2 and CH4, as indicated by estimates of its radiative forcing" (Kinnison, Douglas; Shine, Keith P. 2018)

The formation of stratosphere, on the other hand, contains dinitrogen, dioxygen, ozone and little water. Atmospheric pollution is generally studied as tropospheric and stratospheric pollution. Harmful ultraviolet (UV) radiations from prevents about 99.5 per cent of the sun's the presence of ozone in the stratosphere protecting humans and other animals from it's reaching the earth's surface and thereby effect. "Under the new guideline, nearly the entire global population 97% is classified as exposed to unsafe levels of PM2.5.The new limit for nitrogen dioxide (NO2) became 75% lower" (Carrington D 2021)

Tropospheric Pollution: Tropospheric pollution occurs due to the presence of undesirable solid or gaseous particles in the air. "Ground-level ozone (O3), also known as surface-level ozone and tropospheric ozone, is a trace gas in the troposphere (the lowest level of the Earth's atmosphere), with an average concentration of 20–30 parts per billion by volume (ppbv), with close to 100 ppbv in polluted areas" (Warneck, Peter 1999)



The following are the major gaseous and particulate pollutants present in the troposphere:

Gaseous air pollutants: These are oxides of sulphur, nitrogen and carbon, hydrogen sulphide, hydrocarbons, ozone and other oxidants. Particulate pollutants: These are dust, mist, fumes, smoke, smog etc.

Gaseous air pollutants: (a) Oxides of Sulphur: Oxides of sulphur are produced when sulphur containing fossil fuel is burnt. The most common specie sulphur dioxide is a gas that is poisonous to both animals and plants. It has been reported that even a low concentration of sulphur dioxide causes respiratory diseases e.g. asthma, bronchitis, emphysema in human beings. Sulphur dioxide causes irritation to the eyes, resulting in tears and redness. High concentration of SO_2 leads to stiffness of flower buds which eventually fall off from plants. Uncatalysed oxidation of sulphur dioxide is slow. However, the presence of particulate matter in polluted air catalyses the oxidation of sulphur dioxide to sulphur trioxide. 2SO2 (g) +02 (g) → 2SO3(g)

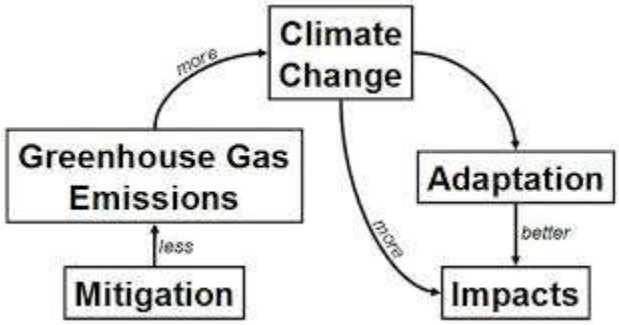
(1) Carbon dioxide: Carbon dioxide (CO_2) is Hydrocarbons: Hydrocazione are composed of hydrogen and carbon only and are formed by incomplete combustion of carbon used in automobiles. Hydrocarbons are carcinogenic, Le, they cause cancer. They harm plants by causing ageing, breakdown of tissues and shedding of leaves, flowers and twigs.

(d) Oxides of Carbon:
(1) Carbon monoxide: Carbon monoxide (CO is one of the most serious air pollutants. It is a colorless and odourless gas, highly poisonous to living beings because of its ability to block the delivery of oxygen to the organs and tissues. It is produced as a result of incomplete combustion of carbon. Carbon monoxide is mainly released into the air by automobile exhaust. Other sources, which produce CO, Involve incomplete combustion of coal, firewood, petrol, etc. The number of vehicles has been increasing over the years all over the world. Many vehicles are poorly maintained and several have inadequate pollution control equipments resulting in the release of greater amount of carbon monoxide and other polluting gases. Do you know why carbon monoxide is poisonous? It binds to hemoglobin to form carboxyhaemoglobin. which is about 300 times more stable than the oxygen-hemoglobin complex. In blood, when the concentration of carboxyhaemoglobin reaches about 3-4 per cent, the oxygen carrying capacity of blood is greatly reduced. This oxygen deficiency, results into headache, weak eyesight, nervousness and cardiovascular disorder. This is the reason why people are advised not to smoke. In pregnant women who have the habit of smoking the Increased CO level in blood may induce

premature birth, spontaneous abortions and deformed babies released into the atmosphere by respiration. Burning of fossil fuels for energy, and by decomposition of limestone during the manufacture of cement. It is also emitted during volcanic eruptions. Carbon dioxide gas is confined to troposphere only.

Normally it forms about 0.03 per cent by volume of the atmosphere. With the increased use of fossil fuel, a large amount of carbon dioxide released into the atmosphere. Excess of CO. in the air is removed by green plants and this maintains an appropriate level of CO_2 in the atmosphere. Green plants require CO_2 for photosynthesis and they, in turn, emit oxygen, thus maintaining the delicate balance. As you know, deforestation and burning of fossil fuel increases the CO_2 level and disturb the balance in the atmosphere. The increased amount of CO_2 in the air is mainly responsible for global warming.

Global Warming and Greenhouse Effect: About 75% of the solar energy reaching the earth is absorbed by the earth's surface, which increases its temperature. The rest of the heat radiates back to the atmosphere. Some of the heat is trapped by gases such as carbon dioxide, methane, ozone, chlorofluorocarbon compounds (CFCs) and water vapor in the atmosphere. Thus, they add to the heating of the atmosphere. This causes global warming. 'Climate change has happened constantly over the history of the Earth, including the coming and going of ice ages. But modern climate change is different because people are putting carbon dioxide into the atmosphere more quickly than before" (Lee, Howard 2020) Carbon dioxide crosses the delicate proportion of 0.03 per cent; the natural greenhouse balance may get disturbed. Carbon dioxide is the major contributor to global warming, besides, carbon dioxide, other greenhouse oxide, CFCs and ozone. Methane is produced gases are methane, water vapour, nitrous naturally when vegetation is burnt, digested or rotted in the absence of oxygen. Large amounts of methane are released in paddy fields, coal mines, from rotting garbage dumps are man-made industrial chemicals used in and by fossil fuels.



CONCLUSION

Chlorofluorocarbons (CFCs) air conditioning etc. CFCs are also damaging the ozone layer (Section 14.2.2). Nitrous oxide occurs naturally in the environment. In recent years, their quantities have increased significantly due to the use of chemical fertilizers and the burning of fossil fuels. If these trends continue, the average global temperature will increase to a level which may lead to melting of polar ice caps and flooding of low lying areas all over the earth. Increase in the global temperature increases the incidence of infectious diseases like dengue, malaria, yellow fever, sleeping sickness etc.

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