

Pollutants essay

[Environment](#), [Pollution](#)



Introduction

Air food and shelter are the three basic necessities of life where air is the most essential elements for a human body to live and survive. Air is nothing but a mixture of oxygen, vapors, inert gases, and nitrogen which make up to 99.9 percent of it. In turn, human releases carbon dioxide which can be harmful for all the living creatures that are plants, animals and human being. There are numerous kinds of pollution. Its causes and effects have been largely discussed in many platforms. Some of the effects that are well known are development of holes in ozone layer, greenhouse effect, smog and acidic rain. Each of them has serious repercussion on the well-being and health of the individual and on environment as a whole. There is a constant depletion going on due to the polluted air which is increasing every minute. This depletion is affecting ozone layer and thus a gaseous system which is imperative to support living creatures and its life on earth is facing a great threat.

Air pollutant is a substance which is present in the environment that is harmful for all human and living creatures on earth. These pollutants have different facets such as gas, liquid droplets or even solid particles. They are considered to be primary and secondary when it comes to classification. Primary pollutants are a result of an erosion of natural process such as volcano, gases that consists carbon monoxide which is erected from cars and other vehicles and waste of chimneys from factories such as sulphur dioxide. Whereas, secondary pollutants are not the direct emission; but is formed due to the collaboration with primary pollutants. One major example is that of

ozone which is being harmed by the interaction of many primary pollutants which makes smog. Lastly, some pollutants are both secondary as well as primary because they are emitted directly as well as are formed by interacting and reacting other primary pollutants.

Significant primary pollutants that are a result of human activity are as under:

- Carbon monoxide with chemical formula CO; is the most poisonous gas having no color or odor. This results due to incomplete combustion mixture of natural gas, wood or coal. The major source of carbon monoxide is vehicular exhaust.
- One of the major outdoor pollutant is VOC popularly known as volatile organic compound. It is usually divided into different categories of non-methane and methane. Methane is a greenhouse gas that contributes to extensive global warming. Hydrocarbon VOCs is also one of the most important gas of greenhouse which creates ozone layer and prolongs methane's life in atmosphere. Aromatic compounds present in non-methane leads to leukemia. Butadiene is also one of the most dangerous chemical compounds that are usually related to industrial usage.
- Methane is second largest contributor caused by human to the global warming which is not considered critical very often. The continuous emphasis on " carbon" drives people to rely on that the climate change related issues are the issues with only fossil fuels hence with carbon dioxide. The key basis of methane release in atmosphere is basically the livestock and in fact the livestock agriculture can also be considered as the significant source for the carbon dioxide release as well.

Secondary pollutants are:

- Photochemical smog is a particulate that is formed from primary pollutants and it's a portmanteau. Smog is made due to the burning of coal by a combination of sulphur dioxide and smoke. Now days, smog is no more produced by burning of coal but is the result of emission of industries and vehicles that gets mixed with the ultraviolet light of sun and forms photochemical smog.
- Another component is the level of ground ozone which is formed in collaboration of NO_x with VOCs. O₃ is a major portion of troposphere and also one of the most significant constituent of regions of stratosphere. When the concentrations by human are abnormally high, than combustion of fossil is a constituent of smog.
- PAN is another compound usually called peroxyacetyl which is produced by VOCs and NO_x.

Air Pollution & Changes in Climate

Although air pollution is responsible for changes of climate in our planet earth but all kinds of them doesn't have the similar effect. There are several kinds of air pollution. Some of them need to be given more importance as it is contributing speedily in global warming. Other is causing global warming to become slow by creating temporary effect of cooling for few weeks .

Air pollution and climate changes are not quite different phenomena, hence their causes are also similar. These causes are the release of many air pollutants and other form of hazardous material from a number of activities and sources. Burning of Fossil fuel is one major source of air pollution and climate change hence taking actions in terms of reducing air pollution

through reducing burning of fossil fuel will enhance the air quality and greatly reduce air pollution which will help in sustaining a good climate around globe. Various air quality and pollution related issues, like particulate matter and ground-level ozone are mostly observed in lower part of our earth's hemisphere. The global atmospheric temperature increase is triggering alterations in climate around the globe. Climate change can be expected to come with significant other changes in several regions mainly as increase in storms frequency and precipitation patterns. Another issue related to global warming is the rise of sea level worldwide due to the melting of glaciers .

Some pollutants in air are causing greater global warming:

Greenhouse gas is a part of air pollution. Carbon dioxide is one of the components what emits from trucks and cars. Therefore, it causes global warming by catching heat from sun in earth's atmosphere. It is a natural part of atmosphere but since last 150 years, this amount has increased tremendously in the environment. This reason behind this increment is the smoke that is released from cars, trucks and even chimneys of factories. Many of the scientists have predicted that the warming will increase like this and even more in the next few decades .

Some pollutants in air causing slowdown in warming of climate:

Many vehicles such as trucks and cars are release small particles in the environment. These particles are known as aerosols. This is formed with a combination of several things such as sulfates, carbon, mineral dust and sea salt. Some of them are mixed in the air naturally. Much dust is lifted from in

the air from deserts and droplets are evaporated from oceans. On the other hand, air pollution caused by humans in shape of fuel burning and fossil fuels also gets added to atmosphere. Therefore, aerosols have a great impact on the climate where as some have cooling effect too. Gases of greenhouse present in the air for several decades which causes global warming. An aerosol creates about half cooling whereas greenhouse gases create double warming .

Health Hazards due to Air pollution

Air pollution is considered to be the greatest risk to the health of human body that damages respiratory system, can causes heart disease, lung cancer and several other hazardous infections. An individual can feel difficulty in taking breath and can have cough, wheezing and asthma. This leads to more need of doctor, medical institutions and medicines.

Cardiovascular system and respiratory system feels a great threat when the air is polluted. Some of the individuals are more prone to allergies and reactions and others are less .

The common component present in air pollution includes sulphur dioxide, ozone and nitrogen dioxide. The rate of deaths all around the world is more than 3.3 million where children that are below five years are most vulnerable towards this cause of death. Air pollution has both a long and short term effects on human health. Some individuals are prone to allergies more than others. Young individuals and teens and adults above 50 years often suffer more due to air pollution. Patients facing asthma, lung and heart diseases are badly affected when there is a polluted air. Duration of facing the air depend on the repercussion .

Irritation in eyes, bad throat, running nose, pneumonia and bronchitis are some of the short term effect to the individual due to air pollution. Several other symptoms such as allergic reactions, nausea and headaches are some other short term repercussion of air pollution. London faced tragic deaths of four thousand sufferers in 1952 due to pollution .

Long term effects include diseases in nerves, kidney, brains and heart. Many sufferers also face lung cancer and due to improper breathing. Researchers claim that more than half million dies every year due to smoking and bad pollution in United States of America .

There is an ongoing research on air pollution and its effect to health by many scientists and professionals. The cure of these illness and its medicines are very expensive which takes millions of dollars in health care cost and welfare projects every year.

Sources of air pollution:

An air pollutions source includes activities in factories and industries, vehicles emission and various locations. The various categories of these sources are discussed as under:

Sources of Anthropogenic that is related to human activity and burning of various types of fuel.

- Stationary sources are the smoke coming out of manufacturing plants of factories, power plants and wastes from the manufacturing unit. Many countries burns their biomass in a traditional way which proves to be the main source of pollution which includes burning of crop waste, dung and wood too.
- Other sources include marine vessels, sound effect and motor vehicle.

- Control burning is one of the technique which is used in management of forest, restoration of prairie, farming and to abate greenhouse gas.

Controlled fire is a tool used for forest as well as for grassland ecology. It helps the renovation of forests and germination of new and desirable trees in the forests .

- Fumes that usually come out of varnish used in furniture and doors, hair spray mostly used by females, paint for offices and homes and many other solvents used daily .

- Deposits that are done in landfills usually with the help of waste, generates methane which forms flammable explosive and mix with air. Suffocation and asphyxia is the illness that may result due to the displacement of oxygen. Concentration of oxygen may decline below 19.5 percent due to displacement.

- Military use of rockets, toxic gases, guns and nuclear weapons are also a cause of air pollution.

Natural sources

- Areas where there is no vegetation at all or to some extent releases dust as a natural source .

- Cattle also release methane as the result of digestion after food.

- Gas known as radon also releases from decay of radioactive in the crust of earth. It is an odorless, colorless and radioactive gas that occurs naturally and is produced when the radium gets decayed. It is very dangerous for health of all living creatures present in this planet earth and ranks on 2nd number for being responsible of lung diseases and cancer after smoking of cigarette .

- Wildfires usually release carbon monoxide and smoke too.
- Activities usually volcanic that produces chlorine, ash particles and sulphur.

Control devices

There are many control devices set by industry and transportation users in order to control pollution. They are responsible for destroying contaminants and removes exhaust stream which has to be emitted in the environment.

Carbon sequestration

It is a process of capturing and storing atmospheric CO₂ and refers to:

- This is a process which deals in removing carbon's presence in an environment, and also deposits it in the reservoir. It carries out deliberately and also refers to the removal of carbon dioxide that is a part of geo engineering. Process of capturing and storing carbon, where CO₂ that is carbon dioxide is being removed from the gases which is usually appears in power stations, before getting stored in the reservoirs which are mostly underground .
- Cycling with the help of biogeochemical among the reservoirs and atmosphere for instance rocks weathering with the help of chemical cycling .
- There is a concept of carbon sequestration which is usually storage of CO₂ for a longer period of time in order to mitigate so as to decrease warming of globe and minimize any hazardous climate change in future. It is suggested to slow down the marine accumulation of gasses such as green house and those that are released from burning of fossil fuels .
- CO₂ is captured naturally from the environment and air through physical,

biological and chemical processes. There is also one technique followed namely anthropogenic sequestration which exploits natural process where as some processes are done artificially too .

Methane Capture and Control

At least three percent of natural gas that is produced in U. S. from oil & gas industry gets emitted and wasted due to leaks and/or vented to the earth's atmosphere every single year. Methane is basically one of the global warming pollutants which is about 25 times higher potent as compared to the carbon dioxide if considered for about 100-year time period. The methane pollution increases the rate of climate change. The prevention of leakages through venting from the natural gas producers would certainly reduce pollution that is based on methane. This will improve the air quality along with improving the health standards. The oil and gas producers can easily afford the technologies related to methane control and in fact, capturing the currently wasted methane from atmosphere and then selling can easily bring about \$2 billion worth of revenue per year.

Particulate control includes mechanical collectors usually from multi-cyclones and dust cyclones etc.

- ESP is famously known as electrostatic precipitators is used for air cleaning purpose through removing particles from air such as flowing gas and induces electrostatic charges. It is highly effective device of filtration that prevents the smooth gas flow through one of the device and removes particles that include fine dust particle and smoke that arrives from burning of fossils and usage of vehicles .

- A bag house is designed to manage heavy loads of dust and is a collector of

dust through blower, filter system, and dust filter. It also removes dust completely by distinguishing dust from air and utilizes disposable filters filter so as to minimize the presence of dust in air .

- Particulate is wet scrubber which controls pollution through its efficient technology. Through wet scrubber, the gas which is polluted is mixed with the liquid for scrubbing and forces through liquid pool so as to get contact with other gases to remove all the pollutant particles present in the gas . Scrubber system is a vast group of pollution controlling device that is used for the removal of particles in the air that is emitted from industrial streams. This acts as washing out of acid from the gas and also control the emission of gases mainly acid gases. It also uses for the purpose of heat recovery that is usually present in hot gas due to gas condensation .

More technologies for controlling air pollution include mercury control, VOC abatement, SO₂ control, NO_x control, CEMS, dioxin control, furan control.

Conclusion

Air is no doubt a basic necessity of human and natural life and when there is a pollution in air than off course all the living creature will survive with numerous hazardous illness and reactions caused by these pollutants present in the air. In order to minimize the air pollution every individual, organization and government on their part must focus on the filtration of gases and recycling of waste that is produced from the manufacturing units in the country. These chemicals when filtered can be re-used, which can be beneficial in terms of cost saving to the organization and protecting air from pollution.

There should be a strong monitoring team and legislation to control the

emission of black smoke and hazardous gas that comes out of vehicles. People need to strictly monitor their vehicles and must not support these gases just to save some pennies. Technology up gradation in this regard must be a continuous process by the individuals and by the government at large. Natural way to deal with this pollution is just a penny away that is the role of plantation, growing trees and developing loads of greenhouses can play a vital role in saving the environment from the hazardous gases which is dreadful for the entire human welfare and environment.

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