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ORIGINAL PAPER

Environmental Air Pollution - A matter of Extreme Attention

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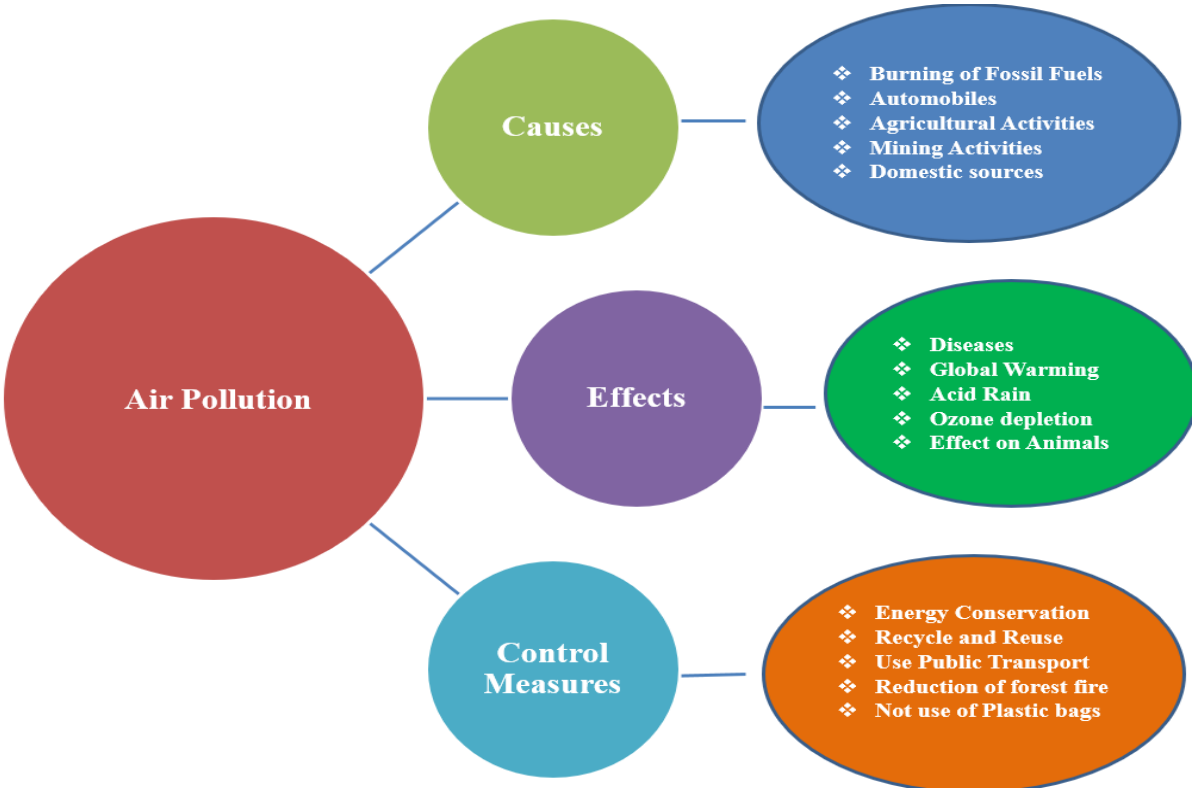
The environment is the surrounding that we live in, and protection of it from any destruction is our duty. Nowadays, environment pollution is one of the major problems that human society is facing. Any un-natural and negative changes in any dimension such as physical, chemical, and biological features of any part of the ecosystem *i.e.* air, water or soil which may have adverse effects on different forms of life and property is called environmental pollution. Pollutant is any substance that causes detrimental effects or discomfort in the organisms. Persistent pollutants are those that remain stable in the environment for longer period of time without any alteration in their original form *e.g.* insecticides, pesticides, fungicides, nuclear trashes, and plastics etc. Biodegradable pollutants are produced if the decomposition process is carried out by living organisms. Mechanization, urbanization, population growth, investigation, and mining are not only major causes of environmental pollution but also involve the transboundary movement of pollutants from developed countries to developing countries or *vice-versa*. Transboundary movement is a major cause of air, water, and soil pollution by toxic metals. Furthermore, environmental pollution is activated by the introducing harmful materials, *e.g.* gaseous pollutants, toxic metals, and particulate matter into the air; sewage, industrial effluents, agricultural runoff, and electronic trashes into water resources; and activities like landfills, illegal dumping of refuses, mining and deforestation that causes soil pollution.

AIR POLLUTION

Air pollution defined as any physical, chemical or biological alteration in the air. It is the impurity of air by dangerous gases, dust particles and smoke that greatly disturbs plant

species, animal species and human beings. This inequality in the gaseous configuration has brought about in an increase in Earth's temperature, which is known as global warming. When pollutants are directly emitted by human or natural activities, they are called primary pollutant *viz*. CO_2, SO_2, NO_x, particulate matter, hydrocarbons, etc. Moreover, as soon as the primary pollutants respond with atmospheric moisture content, a different kind of pollutants is formed that identified as secondary pollutant *viz*. carbonic acid, nitric acid, sulphuric acid etc.



CAUSES OF AIR POLLUTION

Burning of fossil fuels

An enormous quantity of sulfur dioxide is released when fossil fuels are burned. Carbon monoxide, which is released when fossil fuels are incompletely burned, also causes air pollution.

Vehicles

Automobiles such as cars, motor cycles, trucks, vans, jeeps, etc. contaminate the environment. These are the chief sources of greenhouse gases and also act as source of diseases in humans.

Farming Activities

NH_3 is one of the major hazardous gases released from farming activities. Insecticides, pesticides and fertilizers release dangerous chemicals into the air and pollute it.

Factories and Industries

Factories and industries are the main sources of CO (carbon monoxide), organic compounds, hydrocarbons and harmful chemicals that released into the air and fade its quality.

Mining Activities

In the mining process, the minerals below the earth are extracted using large pieces of equipment. The dust and chemicals released in the process not only pollute the air, but also damage the health of workers and local residents.

House well

Cleaners and paints that used in the houses contain toxic chemicals that are released into the air. The fragrance of freshly painted walls is the aroma of the chemicals in the paint. It affects the breathing and pollutes the air.

EFFECTS OF AIR POLLUTION

Dangerous effects of air pollution on the surroundings include:

Diseases

Air pollution has given rise to numerous respirational ailments and heart diseases in human beings. Lung cancer cases have greater than over the past few decades. Families who live near polluted areas are more susceptible to pneumonia and asthma. Many people pass on year by year from the direct or indirect effects of air pollution.

Global Warming

Due to the release of greenhouse gases, there is disparity in the gaseous configuration of the air. This is the major cause of an increase in the temperature of the earth. This rise in temperature is called as global warming. This has caused in the melting of glaciers and a rise in sea level. Due to this several areas become waterlogged areas.

Acid Rain

Combustion of fossil fuels produce dangerous gases like SO_2 and NO_2 into the air which combines with atmospheric water, become acidic and falls to the ground in the form of rain, snow, fog or hail that harms human, animal and plant life.

Destruction of the ozone layer

The release of chlorofluorocarbons, halons and hydrochlorofluorocarbons into the stratosphere is the major cause of ozone layer depletion. This happens when the chlorine and bromine atoms come in contact with ozone and destroy the ozone molecules. The depletion of the ozone layer does not inhibit the destructive U.V. rays coming from the sun and this causes skin diseases and eye irritations in people.

Effect on animals

Air pollutants are suspended in water sources and affect marine life. It also forces animals to leave their living place and move to a different location. This makes them wanderers and has also led to the elimination of a great number of animal species.

CONTROL MEASURES FOR AIR POLLUTION

Following are the measures one should adopt, to control air pollution:

Avoid the use of vehicles

Using public transport and people should avoid using vehicles for shorter distances. Less release of fuels and gas, using public transport, not only avoids pollution, but also helps in saving money and energy.

Energy saving

Large amounts of fossil fuels are burned to generate electricity. Therefore, remember to switch off electrical devices when you are not using them. In this way you can protect the environment on distinct level. The use of energy-efficient strategies such as CFLs also helps to control pollution at a greater level.

Use of clean energy resources

The use of solar, wind and geothermal heat reduces air pollution to a higher level. Several countries, including India, have adopted the use of these assets as a step to a cleaner environment.

Other measures to keep the air clean are:

1. Minimize and lessen use of fire and fire crackers.
2. Meanwhile industrial emissions are a main source of air pollution; pollutants can be controlled or treated at source to reduce their impact. Use less toxic raw materials to improve the efficiency of the process.
3. Fuel substitution is another way to control air pollution. The Government of India has also taken up use of CNG, an eco-friendly fuel, for use of petrol driven vehicles. These are mainly implemented by vehicles that are not fully powered by ideal emission engines.

4. There are numerous practices in India that focus on improving air quality but mostly are neglected or not applied properly. There are still many vehicles on the road that have not been tested for vehicle emissions. Air quality standards, emission standard for vehicles and other actions to reduce emission should be tightened.
5. Another way to control air pollution caused by industry is to modify and maintain existing facilities to minimize the emission of pollutants.
6. Sometimes it is not possible to control pollutants at the source. In this case we can have process control devices to control contamination.
7. Dilution of air pollutants is the effective way to control air pollution.
8. Reforestation is the best way to control the air pollution and it is more effective in high pollution areas. Plants and tress reduces air pollution; thus by planting more trees we save the earth and lives on earth.

Categories of Air Quality Index (AQI)

Air Quality Index (AQI) Values	Levels of Health Concern	Colors
0-50	Good	Green
51-100	Moderate	Yellow
101-150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

(Source: https://www.epa.gov/outdoor-air-quality-data/air-data-basic-information)

Air Pollution Level in cities of Punjab

Cities	Status	AQI-US	PM2.5	PM10	Temp	Humid
Abohar	Poor	140	72	186	47	17
Amritsar	Moderate	92	31	44	38	26
Haripur	Moderate	78	26	49	45	18
Jalandhar	Moderate	80	28	51	43	21
Khem Karan	Moderate	91	31	34	47	19
Ludhiana	Moderate	86	29	76	45	19
Malaut	Poor	137	70	175	46	20
Mauli	Poor	122	44	62	43	20
Pathankot	Moderate	84	28	46	42	18
Patiala	Moderate	81	26	70	46	19

(Source: https://www.aqi.in/dashboard/india/punjab)