

## Pollution:

(1) **Air** : Air is the most important element of our life. Air pollution cannot be defined clearly. Air is a mixture of gases and moisture. It also has some inert substances.

We cannot have 'pure air' in any part of the world. When we breathe oxygen, as well as some other gases and substances, enter our respiratory system, before we talk about air pollution, we need to know what are the elements in pure air. The composition of pure air is shown in the following table.

### Pure air structure (near sea surface)

Sr. No.	The components	Indicator $\frac{1}{4}$ Symbol $\frac{1}{2}$	Attendance percentage
1	Nitrogen	N <sub>2</sub>	78.09
2	Oxygen	O <sub>2</sub>	20.94
3	Argon	Ar	0.93
4	Carbon dioxide	CO <sub>2</sub>	0.0318
5	Neon	Ne	0.0018
6	Helium	He	0.00052
7	Krypton	Kr	0.0001
8	Methane	CH <sub>4</sub>	0.00015
9	Hydrogen	H <sub>2</sub>	0.00005
10	Carbon mono oxide	CO	0.00001
11	Nitrous oxide	N <sub>2</sub> O	0.00025
12	Xenon	Xe	0.000008
13	Ozone	O <sub>3</sub>	0.000002
14	Sulfur dioxide	SO <sub>2</sub>	0.000002
15	Ammonia	NH <sub>3</sub>	0.000001
16	Nitrogen dioxide	NO <sub>2</sub>	0.000001
17	Water	H <sub>2</sub> O	1-3

The air element is virtually life itself. Historically, air pollution started with the invention of fire. After this, it started to grow with the processing of iron and gold and is increasing continuously with the use of coal. A new era of pollution began with the invention of the steam engine of the 18th century and with the Industrial Revolution. During this period, with the increase in motor vehicles, there has been a tremendous increase in it. At present, according to the World Health Organization (WHO), 'Air pollution is a condition under which the human body and its harmful elements in the external environment accumulate intensively.' Quantitative or qualitative changes in the general organization, which adversely affect life or biodegradable abiotic components, is called air pollution.

Airborne pollution is beyond the political boundaries of the world. It affects atmospheres and human settlements far from its sources. Power houses (especially coal-based), acid rain, motor vehicles, pesticides, forest fires, garbage generated by agricultural operations, cigarette smoke, kitchen smoke, etc. are the major factors in pollution caused by human activities. Before this, discuss these factors in detail, see what side effects of air pollution have on human health and on animals and plants.

**Major air pollutants:**

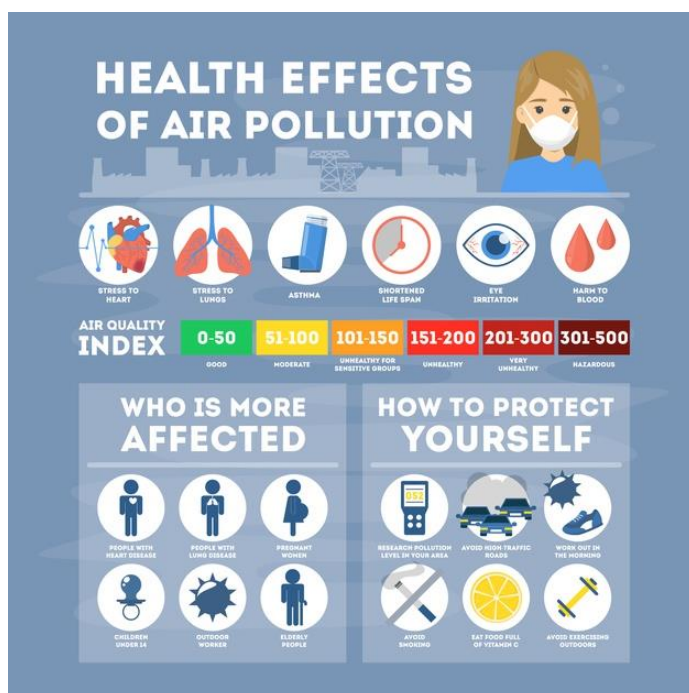
- 1- Sulfur Dioxide (SO<sub>2</sub>)
- 2- Nitrogen Oxide (NO)
- 3- Carbon monoxide (CO)
- 4- Solid Particulate material
- 5- Iron particles
- 6- Ozone (O<sub>3</sub>)
- 7- Carbon dioxide (CO<sub>2</sub>)
- 8- Hydrocarbons
- 9- Methane
- 10- Some metals
- 11- Radiation.

The table presented shows the side effects of air pollution.

**Common air pollutants, their sources and their effects on human health (Pathological Effects)**

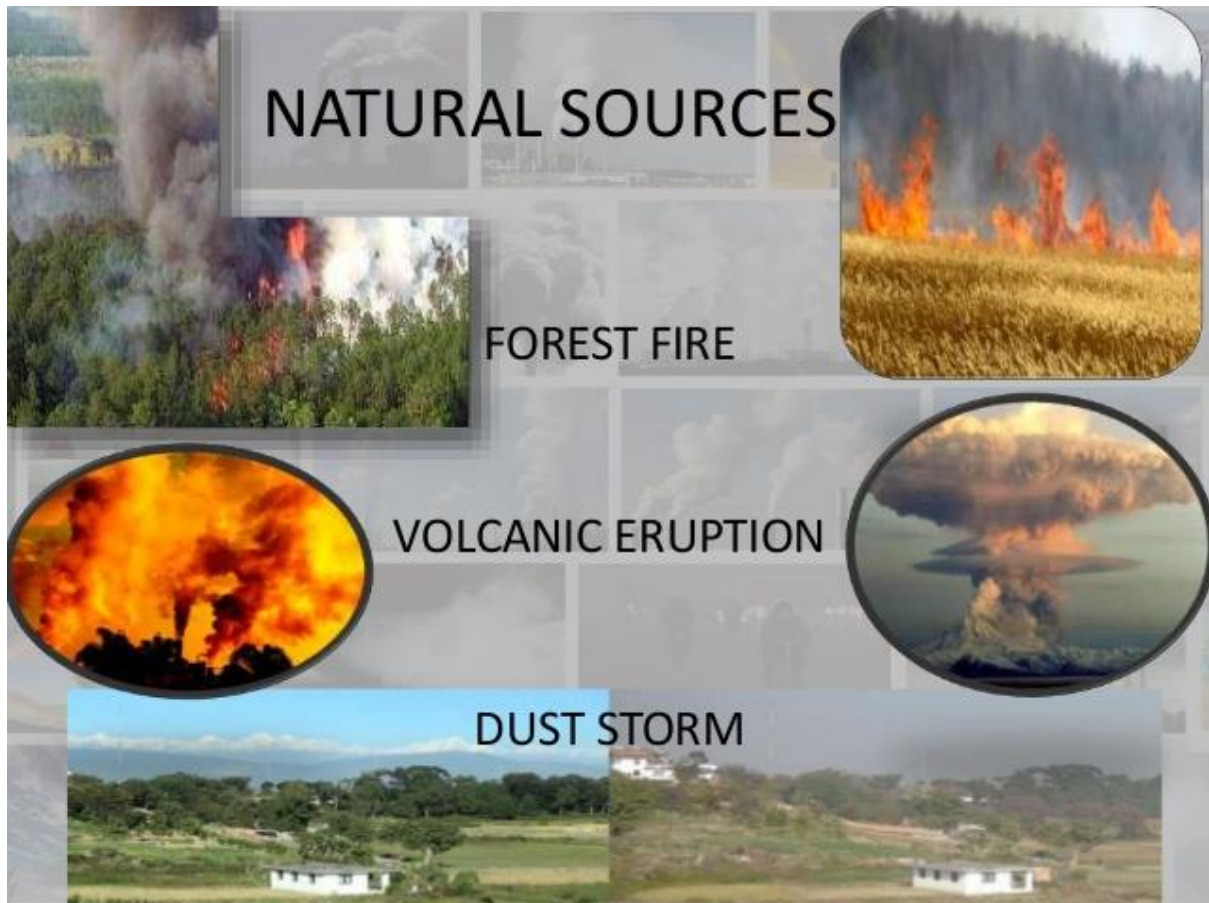
S.No.	Pollutant	The source	Effects on human health/body
1	Aldehydes respiratory	Thermal Decomposition of oil, fat, glycerol	Upper respiratory tract and institute irritation
2	Arsenic jaundice	Coal and Oil Manufacturing	Lung damage (lung and skin cancer)
3	Ammonia jaundice	Chemical Processes - Formation of Dice, Explosives, Fertilizer Materials	Lung damage (lung and skin cancer)
4	Banjine	Oil Purifier Factory, Automotive (Smellcis)	Prolonged exposure to leukemia
5	Cadmium	Coal and Oil Operated Kilns	Long-term contact with kidneys
6	carbon monoxide	Smoke emitted by motor vehicles. Steel factories, coal and oil furnaces	Malfunction in lungs, osteoporosis, lack of oxygen in the body, and adverse effects on the heart
7	Chlorine	Chemical factory	Mucous Side Effects on Respiratory Institute
8	Fluoride Ions (Ions)	Steel steel factory	Tooth loss
9	Hydrocarbons	Waterless gasoline vapor	Affect respiratory institution
10	Hydrocyanide	Fumigation Brass Furnaces Blast Furnaces; Chemical Manufacturing Chemical Industry	Effect on eyes, sore throat, headache, effect on lungs

11	hydrogen chloride	Fumigation Brass Furnaces Blast Furnaces; Chemical Manufacturing Chemical Industry	Effect on eyes, sore throat, headache, effect on lungs
12	Hydrogen fluoride	Petroleum Purifier Factory, Fertilizer	Skin irritation, eye irritation
13	Hydrogen sulfide	Refineries refineries, Sewage Treatment	Eye irritation, nausea, foul smell
14	Manganese	Steel Plant Thermal Power Plant	Risk of Parkinson's disease by staying in an unprotected state for a long time
15	Nickel	Smelters, coal and oil furnaces	Chances of lung cancer
16	Nitrogen oxide	Soft coal, emission of motor vehicles	Cough, Asthma Influenza
17	Ozone	Obtained from nitrogen oxides and hydrocarbons in the presence of light	Eye irritation, promote asthma
18	Fascin	Producing various chemicals and Dye	Cough, burning sensation, fatal lung disease
19	Lead	Smelters motor vehicle smoke	Prevents brain damage, high blood pressure, physical growth
20	Sulfur dioxide	Smelters from the burning of coal and oil	Shortness of breath, irritation etc.
21	Suspended solids	Rubber particles in the air from various generating units	Emphysema Eye irritation, possibly even cancer (eg smoke, ash etc.)



**Sources of air pollution** - The process of air pollution due to natural and human causes is called air pollution. Therefore, there are two main sources of air pollution: natural and human.

**Natural Source** - There are many sources in nature that contaminate the air system. Such as volcanic action, davygni (forest fires), organic waste etc. The lava, rock fragments, water vapor, ash, various gases, etc. emitted during volcanic eruptions contaminate the atmosphere. Ashes, smoke gases etc. pollute the air due to davygni or forest fire. Methane gas contaminates the atmosphere due to rotting organic matter in marshy areas. Apart from this, fog, meteorites, microorganisms, pollen, sea minerals also play an important role in air pollution. But air pollution from natural sources is relatively limited and less harmful.



**Human Source** - Air pollution is continuously increasing by various activities of mankind. The major human sources of air pollution are -

**1- Destruction of forests** - Due to the continuous increase in population, the demand of agricultural land, residential land, industrialization etc. has increased. Which is being supplied by cutting the forests. The environment ecosystem remains balanced in the presence of forests, it has become imbalanced due to the destruction of forests.





**2- Industry / Tomorrow Factory (Small, Medium, Large) -** Industry is the main factor in sources of air pollution. As a result of the industrial revolution, industrialization took place all over the world, but at the same time serious problems like air pollution have increased. Various gases from the chimneys of industries such as carbon dioxide, sulfur monoxide, sulfur k. Oxides, hydrocarbons, dust mites, vapor particles, smoke etc. are the main factors of air pollution.



**3- Transportation** - Transport is a very important cause of air pollution. With the increase of population, the means of transport has also increased in abundance. Due to the combustion of petrol and diesel used in automatic vehicles, many air pollutants are produced such as carbon monoxide, nitrogen and sulfur oxides, smoke, glass etc. The combustion of one gallon of petrol by an automatic vehicle pollutes about 5x2 million cubic feet of air.

The number of vehicles is continuously increasing in all the countries of the world and the results arising from it are being reflected from time to time (such as becoming foggy). According to a study, 33 percent of air pollution is caused by smoke coming out of vehicles. According to a report by the World Health Organization, the level of air pollution in the big cities of the country is two to three times higher than the prescribed standards. According to an estimate there are 70 lakh vehicles in Delhi, more than two lakh auto rickshaws in Mumbai, more than 9 lakh passenger cars, about 10,000 taxis and more than 25,000 buses and more than 3 lakh commercial vehicles. Every day 200 new vehicles are added to the 10 lakh vehicles on the road in Lucknow. There are 1.5 million vehicles in Jaipur, 31 lakh in Bangalore.





**4- From domestic works** - Energy is required to conduct human life. These include domestic work, industry, agriculture, transport etc. Coal, wood, dung, kerosene, gases etc. are used as fuel for domestic purposes like cooking food, heating water etc. The combustion of these organic fuels results in the formation of various toxic gases, which pollute the atmosphere. They release pollutants such as carbon dioxide, carbon monoxide, sulfur dioxide, nitrogen oxides, organic particles, smoke, etc. LPG (LPG) gas pollutes more than conventional fuels (wood, coal, upla). The use of refrigerators, air conditioners is a common practice in modern homes. Chloro-fluoro carbon gas (CFC) emitted from these electrically operated devices is the most responsible factor for the destruction of the ozone layer present in the atmosphere.



**5- Thermal Power Station** - Demand for electricity has also increased in proportion to population growth and increasing industrialization, which is met by coal, natural gases, mineral oils, radioactive materials. Coal, oil and gas are used as fuel in thermal power stations. The various gases emanating from their chimneys, coal ash particles are the main factors of atmospheric pollution. A thermal power plant with a capacity of 1000 MW generates ashes from two lakh sixty thousand tons to 104000 tons in a year. In India, 54 percent of electricity is produced from coal-fired power stations (about 80 thousand MW).



**6- Agricultural work** - The use of chemical fertilizers in agriculture has increased due to the Green Revolution in the country. Along with this, various pesticides are being used in crops. During spraying of these chemical pesticides, they directly or indirectly enter the atmosphere and spoil the pure atmosphere composition. The permanent effect of many insecticidal chemicals is more dangerous because they take too long to decompose or do not decompose such as CDT, BHC, dieldrin, endosulfas etc.



**7 – Mining** - Various explosives are used during mineral activity which is the cause of airborne pollution. Fine particles produced by the extraction of various minerals also pollute the atmosphere. Harmful gases from underground mines are also harmful to the



atmosphere. The radiation emitted from nuclear minerals at the time of extraction is the cause of various diseases.



**8 - Radio Activity** - Radio, alpha, beta and gamma radiation are continuously released from the substances, which are very harmful for the living organisms on the earth. Radiation and heat from radioactive materials contaminates the atmosphere during molecular explosions and nuclear weapons testing. Technical and human errors in nuclear power plants cause air pollution whenever radioactive radiation comes out.



**9-Chemical Substances & Solvents** - There are some such substances found or synthesized in nature. Whose physical or chemical also causes air pollution. Many solvents used in chemicals and industries also cause pollution. Toxic by-products are obtained from certain industries related to chemicals during manufacture of rubber, paint, plastics, etc., which pollute the atmosphere as a result of evaporation.



**10 - Export Materials of Developed Countries** - Development countries are developed countries which are rich in technology and economic terms. They import many items. Machines and other materials cheaply from developed countries cause pollution due to being inferior and outdated. In developed nations, many banned lethal chemicals are given to developing nations at cheap prices or as donations, which are the main cause of air pollution.

**11- Others** - Apart from this, air pollution is also caused by construction works, use of firearms, fireworks etc.

**Effect of air pollution on flora** - Plants are equally affected by air pollution along with humans. The effect of air pollution is clearly reflected on the vegetation. Acid rain, roach fog, sulfur dioxide, fluorides, ozone, carbon monoxide, etc. are the main inhibitors of plant growth, flowering, fruit formation, etc. Sulfur dioxide stops plant growth. Leaf follicles in the

leaves become green infertility. Reduction in the germination of pollinators hinders the formation of seeds and fruits. Nitrogen oxide causes problems of shortening of leaves, etc. Fluorides cause damage to the edges and top cells of the leaves. Peroxy acetyl nitrate reduces the amount of starch in the leaves. Granular substances like lead, mercury, cadmium cause greenness disease in plants and prevent growth. The death of buds is also a problem in cement and coal sector.

**On animals-** The side effects of air pollutants are also clearly visible on animals. Fluoride compound pollutants accumulate in grass clusters and affect animals by entering the food chain, which worsens the ecological balance.

**At the atmosphere -** The most impact of air pollutants is on the atmosphere. Various toxic gases, particulate matter etc. air pollutants have created many disturbances in the ideal gaseous organization of the atmosphere.

**Air pollution control measures-** Considering the deadly effects of air pollution, in the developed countries of the world, since the 1950s and 60s, rapid measures to control air pollution and developed technology are being resorted to. A number of control and management related works have been started here near all the contact areas or nucleus terrestrial industries, decentralized and possible pollution areas. Pollution machines have been installed here at all such places and on the side of congested roads. The limit of maximum tolerance in all conditions of pollution has also been widely set. All pollution-causing factories have started using equipment and specialized technology for pollution control and management as per the norms set by the governments and administration there.

In India too, special studies have been done about the widespread effects of pollution since the 1970s. At present, the administration has made it mandatory to install pollution measuring instruments in all metros and industrial centers. Many institutions of the country are engaged in this work. Notable names of Nagpur (National Institute of Ecology and Environment Research), Environment Department of major universities, Indian Institute of Technology, Bhabha Molecular Research Center, Bombay, National Committee on Environmental Planning and Coordination, Government of India, Union Ministry of Health and Labor, etc. Huh. It is advisable to make all these works in coordination with the national committee of planning and coordination, and to make various rules and laws on the basis of them and use or import special pollution control and technology and equipment. Environmental management organizations have been set up in the central and states for the purpose of coordinating all such works.

Special action for air pollution control in India has been contemplated since the 1980s and some preliminary action has also been taken in the metros. After the Bhopal gas accident at night on 2-3 December 1984, special efforts are being made in this direction. The following efforts and actions are required for air pollution control.

**1-** Pre-installed polluting industries in residential areas of all metros (having population of 10 lakh or more) should be immediately transferred to pre-determined locations (in industrial settlements). By merely selling the available land, setting up an industry at a new place will also result in greater economic benefits.

**2-** To control the fog generated by dissolution, moisture and smoke in the atmosphere, the height of the chimneys which blow more smoke is 80-100 m. Concentration plants should be



made on them to produce solid byproducts from smoke. Such efforts are also being started in Delhi, Bombay and other metros.

**3** - 50 km in any case in metros with a population of more than 25 lakhs. Strict restrictions should be imposed at the national level on the establishment of all types of industries that smoke and cause special pollution in the atmosphere. A similar system should be followed in large cities with a population of 10 lakh to 25 lakh.

**4** - Where machines extract fine particles, such substances should be reassembled by special process by stopping them by machine-cloth or special filter nets to prevent them from spreading in the atmosphere so that the expenses incurred to prevent pollution will not remain unviable. It should be made mandatory in cement and stone powder industry etc.

**5** - In the industry or near environment, if pollution increases due to natural and human reasons, then workers should use special mask.

**6** - To control the smoke emanating from the vehicles and to control all types of leaks arising from them. Even before the first requirement, all vehicles should be smoke-less than certain criteria, otherwise special improvements should be made for energy consumption and smoke control. In areas, the percentage of smoke on traffic collectors should be increased significantly, the effect of vehicles should be controlled immediately. By declaring such places as one-way flow routes, immediate tributaries should be developed there.

**7** - The development of green belt around canal roads and rail routes must be done. Trees should be planted regularly and their records maintained and records maintained. Wherever space is available in buildings, trees must be planted.

**8** - Complete proof device of poisonous gas in molecular institutions should be ensured so that its system remains a decisive control of the functioning of the system.

**9** - All radioactive materials coming out of molecular units can be stored in special bricks by closing them in polythene, by special process, in special compartments, by special process. Before putting them in the ocean floor, they should be sealed in cement or concrete tanks and put in the sea so that the radioactivity in the ocean floor can not increase quickly.

World's Air Pollution: Real-time Air Quality Check Click Here :  
<https://waqi.info/#/c/13.109/12>.

In India Real Time Air Quality check Click Here:

<https://www.aqi.in/#Map>