

History, Types, and Solutions to Pollution

Pollution can be defined as any undesirable change in the physical, chemical or biological characteristics of the natural environment. It is the result of harmful substances or energy released through human activities. Pollution occurs in different forms; air, water, soil, radioactive, noise, thermal and light. Pollution is often classed as point source or nonpoint source pollution. For the point sources, it is easy to identify, control and monitor, whereas, for the non-point sources, it is hard to control. In 2015, pollution killed 9 million people in the world. Carbon dioxide, which is a greenhouse gas, is the main pollutant that is warming Earth. Carbon dioxide can simply be caused by respiration of humans and animals.

Moreover, it is also widely considered to be a pollutant when associated with cars, planes, power plants, and other human activities that involve the burning of fossil fuels such as gasoline and natural gas. In the past 150 years, such activities have pumped enough carbon dioxide into the atmosphere to raise its levels higher than they have been for hundreds of thousands of years. Also, there are some other pollutants such as carbon monoxide, sulfur dioxide, oxides of nitrogen, lead and fine particulates which lead to pollution too.

Most of these gasses are released by the factories or through the combustion of fossil fuels. These gasses are poisonous and can cause a negative impact on human health, climate, agriculture or buildings. Furthermore, air pollution has always accompanied civilizations. Pollution started in prehistoric times when man created the first fires.

According to a 1983 article in the journal Science, “soot” found on ceilings of prehistoric caves provides ample evidence of the high levels of pollution that was associated with inadequate ventilation of open fires. Metal forging appears to be a key turning point in the creation of significant air pollution levels outside the home. Core samples of glaciers in Greenland indicate increases in pollution associated with Greek, Roman and Chinese metal production, but at that time the pollution was comparatively small and could be handled by nature

Types and causes of pollution

Air pollution is the most prominent and

dangerous form of pollution. This pollution looks like soot, containing millions of tiny particles, floating in the air. The burning of fossil fuels is the main source of air pollution. Fossil fuels are burnt using coal, natural gas, and petroleum. This is usually done in domestic and industrial boilers and in the internal engines of vehicles.

The element in the fuels is oxidized when fossil fuels are burnt resulting in the formation of air pollutants. These include carbon dioxide, sulfur dioxide, oxides of nitrogen and fine particulate matter. Smoke from chimneys, factories, vehicles or burning of wood basically occurs due to coal burning, this releases sulfur dioxide into the air making it toxic. (Refer appendix-19) Also, air pollution is caused by human activities such as open burning and the burning of dried paddy stalks. This causes the released of poisonous substances such as carbon dioxide and fine particulate matter which cause the pollution of air. In addition, air pollution can be caused by agricultural activities. Ammonia is a very common byproduct from agriculture-related activities. It is one of the most hazardous gases in the atmosphere. Then, the use of insecticides, pesticides, and fertilizers in agricultural will also emit harmful chemicals into the air which cause air pollution. Next, water pollution is the contamination of water bodies. Water pollution usually occurs when pollutants are directly or indirectly discharged into water bodies without adequate treatment to remove harmful compounds. Firstly, it is caused by the spilling of a large amount of oil into the seas and does not dissolve in water.

Moreover, if the garbage or rubbish in the form of plastic, paper, aluminum, the rubber of food is thrown into river, sea or lakes by each household, it will lead to water pollution. Noise pollution is the propagation of noise with a harmful impact on the activity of human or animal life. Noise pollution is caused when noise which is an unpleasant sound affects our ears and leads to psychological problems like stress, hypertension, hearing impairment. Numerous heavy industrial vehicles, heavy machinery, and above average noise level have all caused tremendous noise pollution in our environments.

Road traffic, domestic noises and even traffic emanating from rail and air all have given rise to increasing noise levels. Effect of various pollutions Pollutions cause harmful effect

on human health. For air pollution, they create several heart and respiratory conditions along with cancer, among other threats to the body. This includes asthma and lung cancer which can lead to death if the condition is worst. Air pollution can cause many diseases such as chest pain, congestion, throat inflammation, cardiovascular disease and respiratory disease. Several million are known to have died due to direct or indirect effects of air pollution. For example, according to India's news, air pollution is the fifth largest killer in India taking 6.2 lakh lives per year and Delhi is among one of the five most critically polluted regions in the country. It said air pollution had also turned out the fifth leading cause of death in the country, after high blood pressure, indoor air pollution, tobacco smoking, and poor nutrition. There is 6.20 lakh premature deaths occur in India from air pollution-related diseases. On the other hand, water pollution occurs due to contamination of water. Thus, it may cause skin related problems including skin irritations and rashes. A human may suffer this problem during the intake of polluted water which contains contaminated or harmful chemical substances.

Similarly, noise pollution leads to hearing loss, stress, sleep disturbance, tired and exhaustion, annoyance and physiological losses. Besides that, pollutions will cause environmental degradation. The environment is the first casualty for an increase in pollution whether in air or water. The process of photosynthesis by plants will be inhibited by the increasing amount of carbon dioxide in the atmosphere. This is because carbon dioxide leads to smog which can restrict sunlight from reaching the Earth. Gases such as sulfur dioxide and nitrogen oxide can contribute to acid rain whereas water pollution in terms of the oil spill may lead to the death of several wildlife species. This is because the toxic pollutants deposit over the surface of the water and cause the depletion of oxygen in the water. In addition, pollution can cause global warming. The gas that mainly contributes to global warming is carbon dioxide. In recent years, new industries are being set up, new vehicles come on roads and trees are cut to make way for new homes. These are directly or indirectly lead to an increase in carbon dioxide in the environment. This results in melting of polar ice caps which increases the sea level and pose danger for the people living near coastal areas.

Solutions for Pollutions In this industrial age, pollution cannot be eliminated completely, but steps can be taken to reduce it. For air pollution, the gases released during the burnt of the fossil fuels is the main contributor to it. Therefore, we can start by reducing the burning of fossil fuel and coal. We can use renewable or green energy sources such as solar energy, hydropower, geothermal energy and wind energy rather than relying on fossil fuels or coal energy.

Other than that, we can use energy devices and always be mindful of energy consumption. We must always make sure the TV, lights, fans, and any other electronic appliances is turn off when not in use in order to reduce the consumption of unnecessary energy. This is because a large amount of fossil fuels is burnt to produce electricity. Then, we can try to use CFL lights which consume less electricity (Refer appendix-22). CFL lights not only consume less electricity, it is also live longer, the electricity bills for it is low and it can reduce pollution by consuming less energy. Besides that, pollution can be reduced by using individual-level prevention methods.

Many ways can be used by the individual to help to reduce air pollution. Firstly, individuals who are aware of the causes and effects of pollution can spread the awareness for their family, friends, colleagues and encourage them to use public transportation when heading to their destinations. This is to reduce the released of greenhouse gasses from vehicles. Secondly, we can use reuse, reduce and recycle method. Reusing some substances such as papers, tissue papers, plastic bags or bottles can reduce loads of pollution. In addition, water pollution can be overcome through industrial wastewater treatment. Loads of wastewater containing high concentrations of conventional water pollutants and other contaminants such as ammonia are normally generated by industries. Thus, it required well-designed treatment and water cooling systems to reduce the water pollution caused by industries. Pre-treatment facilities and adoption of quality waste treatment protocols can be installed for the user to eliminate the toxic contaminants. Moreover, anti-pollution laws and regulations are one of the effective ways to curtail water pollution. This is because laws play an excellent role to ensure the rate of water pollution levels is kept to the minimum. Environmental protection policies such as the

Clean Water Acts work to ensure that anti-pollution laws are effective and apply to all significant waters including groundwater. Antipollution laws can restrict for topwater pollution problems such as sewage and industrial waste treatments and garbage management. Lastly, noise pollutions are sometimes cannot be overcome.

For example, the noises that make by plane, or train cannot be overcome but it can be prevented by us. We can prevent hearing these noise by wearing earplugs, which can bring down loud noises to a manageable level. Also, we can try to stay away from noisy areas. We must always follow the limit of the noise level. The loudness of a speaker, radio or TV should be control. Acid deposition is a general name for a number of phenomena, namely acid rain, acid fog and acid mist. It occurs during the combustion of fossil fuels and other industrial processes undergo complex chemical reactions and emitted gases in the atmosphere. These gases it then emitted to the Earth as wet deposition or dry deposition. Acid deposition can cause a harmful effect on the environment. For wet deposition, it occurs when the acidic chemicals in the air blow by wind and transport to the areas where the weather is wet. Then, these acidic chemicals will fall to the ground in the form of rain, sleet, fog, snow or mist which is the type of wet deposition. This will cause the acid to be removed from atmosphere and deposit on the Earth's surface. These acids are toxic and when they flow through the ground, most of the aquatic life, animals, and plants will be affected.