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## Pollution-A Menace to Mankind

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### Review Article

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#### ABSTRACT

The utilization of resources like wood, coal fuel for cooking, warming, and lighting, is said to put three billion individuals worldwide at danger of harmed wellbeing and early death. There are numerous nations on the planet, such as Africa and Asia that overwhelmingly utilize wood or charcoal, coal etc to cook, to give warmth, and light their homes. Due to this unreasonable levels of contaminants in nature influences an expected 600-800 million families around the world, and they are at expanded danger of sicknesses that includes respiratory tract diseases, pneumonia, COPD, asthma, and lung disorders. Numerous under developed nations have fizzled in their endeavours to handle pollution. Researchers from throughout the world are making a decent attempt along with governments and healthcare organisations to prevent the spread of pollution and to eradicate it completely from the environment and to safeguard the next generation health and well-being.

#### INTRODUCTION

Increase in population has resulted in many problems, such as the problem of food, employment, pollution etc. One of them is the burning problem is of pollution. It is a menace to mankind. Pollution is the way of making land, water, air or different parts of the earth filthy and perilous or unsatisfactory to utilize [1,2,3]. This is conceivable through the presentation of a contaminant into a typical living space. The things, for example, essential light and temperature can be considered as poisons when utilized under wrong conditions on the earth. Contamination impacts more than 200 million people the world over, as demonstrated by Pure Earth, a disadvantage to environmental affiliation. In the areas of the world's most dirtied spots, infants are seen with birth defects, kids have lost 30 to 40 IQ, and future life expectancy is as low as 45 years due to malignancies and diverse diseases. Contamination majorly affects untamed life and this will proceed into more disastrous condition. A 2004 report in "New Scientist" expresses that contamination is the essential reason of the extinction of different types of butterflies and different creepy crawlies in Great Britain. Despite the fact that contamination represents a risk to animals ashore, amphibian animals may confront a much more serious threat [4,5].

Pollution is a blazing issue and is liable to impact the health of people on large scale. The significance of natural things to the prosperity and flourishing of human masses' is logically evident [6,7,8]. Contamination achieves its crest levels in the tremendously populated urban- communities of the more developed nations. In developing and under-developed nations of the world more than 80% contaminated water have been utilized for watering system with just seventy to eighty percent nourishment and living security in mechanical urban and semi urban areas [9,10,11,12]. Pollution alludes to terrible state of environment as far as quality of life is considered. Contamination is the undesirable change in nature which includes physical, organic and synthetic changes including air, water and area which influences the human life in one way or the other.

Pollution can be caused both by natural sources and humans. Pollution is majorly divided into two types:

- a) Natural
- b) Man-made

Volcanic discharges are an instance of ordinary wellsprings of sully. Right when a spring of spouting magma impacts, it releases sulfur dioxide, carbon monoxide, solid particles, and distinctive materials into the air at an a great deal more important rate than is regularly the case. Plants, animals, and individuals may be butchered or hurt by these materials [13,14,15,16]. As this gas is conveyed to Earth's surface, soil and freshwater gets to be fermented. At some level, this fermentation causes metals to end up dissolvable. The poisonous quality connected with sulfur dioxide, acidity, and solvent metals has brought about awesome harm to the structure and capacity of the biological community [17,18].

Ordinary sorts of pollution have existed from long back, and there is little that individuals can do to control such events [19,20]. The contamination impact is more through more destructive human activities and therefore susceptible to human control. Human-brought about contamination in some cases alluded to as anthropogenic contamination. Current problem about contamination started to increment in the 1960s to a great extent as the after effect of two variables. In the first place, populace development in numerous urban zones implied that more individuals and more commercial enterprises were discharging a higher convergence of poisons into nature. Second, cutting edge science had built up various new materials and new methodology that brought about the arrival of numerous new and regularly perilous chemicals to the earth.

Progressively individuals turned out to be more worried about the contamination and its effects and have taken preventive measures under their particular government's direction to regulate the issue. Therefore numerous prevention acts, for example, Clean Air Acts of 1965, 1970, and 1977; the Safe Drinking Water Act of 1974; the Clean Water Act of 1977; and the Toxic Substances Control Act of 1976 were passed worldwide to control contamination.

The anthropogenic or man-made pollution can be widely classified into following types:

### **CHEMICAL POLLUTION**

There is release of filthy water and chemicals from industrial facilities. This contaminated waste is coordinated to streams, rivers etc. The outcome is the contamination of water. There is smoke from automotives which contaminates the air. The considerable clamor in extensive urban areas is an extraordinary nuisance. Industrial and synthetic squanders have influenced water as well as dirtied the air and the water. The transfer of local squanders and grimy water has been emerging in a horrendous form. The Ganga water has not been free from any kind of contamination. Be that as it may, it has been contaminated by virtue of uncontrolled industrialization (Figure 1). The medicinal value of Ganga water has been diminishing day by day. Pollution is such an undesirable change noticeable all around, the water and the area, and their physical, synthetic and organic properties-which destroys any type of creatures and other helpful creatures, plants etc.



**Figure 1:** Release of highly contaminating Chemicals into water

### **AIR POLLUTION**

Air pollution would fuse around two dozen solids, liquids, and gasses. It would consolidate toxins, for instance, sulfur oxides and carbon monoxide and less known materials, for instance, pesticides and fluorides. To the extent the measure of poisons released in a year are concerned, the five materials that cause the most destructive impacts are sulfur oxides, oxides of nitrogen, carbon monoxide, particulate matter, and unstable mixtures. Sulfur oxides, oxides of nitrogen, and carbon monoxide are invention blends. Particulate matter and volatile organic compounds are groups of related pollutants [21,22,23]. The term particulate implies minor bits of solid matter in the earth, including smoke, dimness, fog concentrates, and little particles of carbon. Unpredictable mixes are normal liquids, for example, benzene, toluene, the xylenes, and trichloromethane, that change successfully (volatilize) to a gas [24].

Air is the important source of life for living organisms. If the air is polluted it greatly affects the mankind. Man can avoid using polluted water, but there is no escape from polluted air. Individuals, who inhale this air, are in risk of agony from decrepit sicknesses. Tokyo, the capital of Japan, is one of the most polluted cities in the world. Once in a while there is so much mist, smoke, fog there-that the residents wear covers to go to their work places. The spillage of harmful gas at Union Carbide Factory in Bhopal, in Madhya Pradesh left more than 2,000 individuals to rest forever (Figure 2).



**Figure 2:** A photograph depicting Bhopal gas tragedy

All the vehicles running in cities and towns and everywhere consume oxygen and let out carbon monoxide, nitrogen etc. The balance of oxygen and carbon monoxide has been imbalanced due to ignorance of men. Air pollution affects health negatively. The particles of metal, lead, cadmium, nitrogen oxide and ozone affect our body. The particulars of different metals affect our respiratory system, lead particles weakens our nervous system, cadmium works as poison and causes heart troubles, nitrogen oxide causes diseases of lungs- heart and eyes. Ozone creates eye disease, cough and pain of the chest.

Various sudden scenes have been occurring a result of air defilement in many areas of Asian, African and European nations. The method for street transport-trucks, buses etc and so forth let out smokes like carbon monoxide, lead, nitrogen oxide. All vehicles running in urban areas and towns devour oxygen and let out carbon monoxide, nitrogen and so on. The parity of oxygen and carbon monoxide has been imbalanced because of lack of awareness of men. Air contamination influences wellbeing adversely. The particles of metal, lead, cadmium, nitrogen oxide and ozone influence our body. The particulars of various metals influence our respiratory system, lead particles debilitates our sensory system, cadmium fills in as toxic substance and causes heart problems, nitrogen oxide causes maladies of lungs, heart and eyes. Ozone depletion causes eye diseases, cough and pain in the chest.

### **PREVENTION**

The air contamination can be controlled through the accompanying measures-

- By setting up commercial ventures a long way from cities.
- By empowering the notion of "Develop more Trees".
- By making awareness towards environment and its safeguarding policy.
- By controlling population.
- By convincing the industrialists to follow the laws with respect to environment.
- By utilizing right materials as fuel.

### **WATER POLLUTION**

A broad variety of materials can be classified as water pollutants, including synthetic organic compounds, human and animal wastes, radioactive materials, heat, acids, sediments, and disease-causing microorganisms. The major water pollutants can be described as follows [25].

#### **OXYGEN-DEMANDING AGENT**

An oxygen-demanding agent is some substance that when introduced into water, reacts with oxygen disintegrated in the water. As oxygen is expelled from the water, different live forms that likewise rely on upon that oxygen, (for example, fish and different types of amphibian life) may pass on or move far from the contaminated waters and gets killed [26,27].

#### **SYNTHETIC ORGANIC CHEMICALS**

The term synthetic organic chemical applies to a wide assortment of items created by current science to serve different human needs. These items incorporate plastics, pesticides and herbicides, cleansers, poisonous by-results of modern operations, and oils [28,29,30]. A hefty portion of these items are straightforwardly poisonous to fish, oceanic life, and even to people. Others may not present a genuine wellbeing impact to living beings, but rather can bring about the unattractive aggregation of rubbish, wrecking the recreational estimation of water.

## INDUSTRIAL CHEMICALS

Various inorganic chemicals are discharged from mechanical operations as the by-products of specific procedures. For instance, the component mercury is utilized as a part of the creation of light switches, aeration and cooling systems, glaring lights, floor waxes, prescriptions, plastics, paper, dress, and photographic film, to give some examples of its applications. Every time one of these items is made, some little measure of mercury metal is prone to escape into the earth and, in the long run, into lakes and waterways. This is dangerous as mercury is very harmful to people and different life forms. It causes harm to the sensory system, kidneys, liver, and mind.

## SEDIMENTS

Sediments washed from Earth's surface also pollute water. Any time it rains, a certain amount of sand, clay, silt, and other forms of earthy material are washed away. This sediment has a number of consequences, such as the silting of harbors and reservoirs, damage to shellfish and fish, reduction in the clarity of water, and the loss of water's ability to integrate (blend) oxygen-demanding wastes.

## HEAT

Warm water is not ready to break up as much oxygen as is cool water. In the event that the water in a stream gets to be hotter, it holds less oxygen. Living beings that rely on upon oxygen for their survival, they will either pass on or relocate to different territories. Numerous industries use water in their operation. They take water from a waterway or lake, use it, and return it to the same waterway, however at a higher temperature. This practice, known as thermal pollution, represents hazard to aquatic life in the water (Figure 3).



**Figure 3:** Effect of water pollution on Marine Organisms

## PREVENTIONS

The following measures should be implemented to control water pollution-

1. People should be made conscious towards the consequences of water pollution.
2. The role of state and central government in controlling pollution.
3. By prescribing curriculum in schools and colleges to reduce the pollution.
4. By environmental education to protect the environment.
5. Industries should be established far from the cities.
6. By treating water and recycling it.

## SOUND POLLUTION

Noise can be simply defined as unwanted sound. The sound is pleasant or not depends upon the loudness, duration, rhythm and mood of the person. Noise pollution results in irritation to humans, animals. The various reasons of noise pollution are traffic noise, air craft noise, noise from construction sites, noise from industries, noise from other sources (Figure 4). The deleterious effects of noise pollution are hearing loss, high blood pressure, stress, sleep disturbances, colour blindness. Humans can tolerate only upto certain decibels of sound [31,32,33].



Figure 4: Pictorial representation of noise pollution

### PREVENTION

- 1) **Source Control:** This includes source modification such as acoustic treatment to machine surface, design changes, limiting operational timings, etc
- 2) **Transmission Path Intervention:** This includes containing the source inside a sound insulating enclosure, constructing a noise barrier or provision of sound absorbing materials along the path.
- 3) **Receptor Control:** This includes protection of the receiver by altering the work schedule or provision of personal protection devices such as ear plugs for operating noisy machinery. The measure may include dissipation and deflection methods.
- 4) **Oiling:** Proper oiling will reduce noise from the machine.
- 5) Prescribing noise limits for vehicular traffic
- 6) Ban on honking (usage of horns) in certain areas
- 7) Creation of silence zones near schools and hospitals
- 8) Redesigning buildings to make them noise proof [34,35,36]
- 9) Reduction of traffic density in residential areas
- 10) Giving preference to mass public transport system.

### SOIL POLLUTION AND RADIOACTIVE POLLUTION

Soil pollution is caused by presence of xenobiotic chemicals or other alterations of natural soil environment. It is mainly caused by industrial activity, agricultural chemicals, and improper disposal of waste [37,38,39,40]. Petroleum hydrocarbons, polynuclear aromatic hydrocarbons, pesticides, lead and other heavy metals are responsible for soil pollution (Figure 5).



**Figure 5:** Images of soil and radioactive pollution

Due to atomic reactors, the water, the air and the land pollution is increasing. The minute particles absorbed in the atmosphere move all around the earth as a consequence of atomic explosion. It must be controlled and used for human welfare [41,42,43].

### **PREVENTIONS**

- 1) Limiting the use of fertilizers and pesticides.
- 2) Awareness about biological control methods and their implementation.
- 3) Grazing must be controlled and forest management needs to be done immensely [44].
- 4) Afforestation should be encouraged.
- 5) Treating waste of industries.
- 6) Treating nuclear wastes
- 7) Proper disposing of plastics and garbage [45].

### **CONCLUSION**

Pollution prevention reduces both waste management, clean up, health problems and environmental damage [46,47]. Pollution prevention protects the environment by conserving and protecting natural resources while improving economic growth through more efficient production in industry and less need for households, businesses and communities to handle waste. Pollution prevention is any practice that reduces, eliminates, or prevents pollution at its sources and factors [48]. Pollution prevention measures can be applied to all pollution-generating activities, including those found in the energy, agriculture, Federal, consumer as well as industrial sectors [49,50]. Prevention practices are essential for preserving wetlands, groundwater sources and other critical ecosystems. In the energy sector, pollution prevention can reduce environmental damages from extraction, processing, transport and combustion of fuels.

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