

# Aspects of Air, Water and Soil Pollution

## Abstract

Progress in agriculture and industry is taken a general criterion of development of any country. This craze resulted into unlimited exploitation of every bit of natural resource. The splendid plentifulness of nature is a heritage that should be conserved for future generations and not be spoiled. Unlimited exploitation of nature by man disturbed the delicate ecological balance between living and non living component of the biosphere. Pollutions is a necessary evil of all development. Due to lack of development of a culture of pollution control, there has resulted a heavy back log of gaseous, liquid and soil pollution in our country. Thus pollution control in our country is a recent environmental concern. Not only in India, but in developed western world also, pollution is scare-word.

**Keywords:** Pollution, Air pollution, Water pollution, Soil pollution, control of pollution Act. (Has been sent Nov. 2017 – sent in revised form March 2018)

## Introduction

### What is Pollution?-

Pollution is an undesirable change in the physical, chemical or biological characteristics of air, water and soil that may harmfully affect the life or create a potential health hazard has and of any living organism. Pollution is thus direct or indirect change in any component of the biosphere that is harmful to the living components.

### What are Pollutants?

Any substance which causes pollution is called a pollutant. A pollutant may thus include any chemical or geochemical substance, biotic components or its product or physical factor that is released intentionally by man into the environment in such a concentration that may have adverse harmful or unpleasant effects. A pollutant has also been defined as "any solid, liquid a gaseous substance presence in such concentration as may be or tend to be injurious to the environment"

### Kinds of Pollution

On the basis of the type of environment being polluted pollution is classified as.

1. Air pollution.
2. Water pollution.
3. Land (soil) pollution.

### Air Pollution

#### Atmosphere

The vast expanse of air which envelopes the earth is called atmosphere. The atmosphere extends to thousands of kilometers above the earth's surface. The atmosphere contains life giving gases like oxygen for man and animals and  $\text{CO}_2$  for plants to be used in manufacture of food. Atmosphere protects the earth from the harmful radiation from the sun. It also serves as a store house for water vapor which leads to rainfall fairly distributed over land and sea. The presence of air and water on the earth makes it a unique planet in the solar system.

#### Composition

The atmosphere is a mixture of many discrete gases in which varying quantities of tiny solid particles and suspended. Pure dry air on an average constitutes mainly of nitrogen (78%) and oxygen (21%) making thus 99% of the air by volume. Remaining 1% accounts for gases like argon (0.93%), carbon dioxide (0.03%), hydrogen, helium and ozone. Unfortunately the concentration levels of different gases show variations due to pollution. More over there are also added a number of harmful gases to atmosphere. These adversely affect air quantity and make it unfit for live organisms. In our country data on air quality have been collected NEERI. Although there are several parameters to judge air quality generally three -  $\text{SO}_2$ ,  $\text{NO}_2$  and SPM (Suspended particulate matter) are used which give a fair idea of pollution load carried by the air. The central



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pollution control board (CPCB) has formulated an air quantity standard for different a sectors of the country.

#### **Source and Pollutants**

Sources for air pollution are

1. Industrial chimney wastes.
2. Thermal power stations.
3. Automobiles.

#### **Pollutants**

1. Carbon compounds
2. Sulphur compounds
3. Nitrogen oxide
4. Ozone
5. Photochemical products
6. Metals

#### **Ozone (O<sub>3</sub>)**

It is universally accepted that the ozone layer in the atmosphere protect us from the harmful UV radiations from sun. The depletions of this O<sub>3</sub> layer by human activities may have serious implications. On the other hand, ozone is also formed in the atmosphere through chemical reaction involving certain pollutants (SO<sub>2</sub>, NO<sub>2</sub>) on absorption of UV radiations. The atmosphere ozone is now being regarded as potential danger to human health and crop growth.

#### **Aerosols: the Black clouds of Pollutants over India Ocean**

The haze seven times the size of India over the Indian Ocean has developed over the northern Indian Ocean. This thick layer of pollutants is infact black cloud of aerosols that could have serious effect on rainfall and the onset of monsoon through the effect on cloud formation.

#### **Cost of Pollution**

1. Medical care of health due to diseases as tuberculosis, typhoid, lung cancer etc.
2. Loss of resources by unnecessary wasteful exploitation.
3. Pollution control involving money, funds, manpower for disposal of pollutants and for control devices developed.
4. Damage to crop production.
5. Soiling of buildings and textiles.

#### **Water Pollution**

It is defined as the addition of any substance to water or changing of water's physical and chemical characteristics in any way which interferes with its use for legitimate purposes.

#### **Sources of Water Pollution**

1. Sewage and other waste
2. Industrial effluents
3. Agricultural discharges
4. Industrial wastes from chemical
5. Industries, fossil fuel plants and nuclear power plant

Various aspects of water pollution

1. Ground water pollution
2. Main pollution
3. Mercury pollution
4. Lead pollution
5. Fluoride Pollution

#### **The Real Solution to Water Pollution**

1. All sewage, produced in legal as well as illegal residential sites should be trapped and treated.

2. Sewage must be treated as close to the source as possible to minimize the cost of transportation.
3. Treated effluent must be reused and recycled and not allowed to be mixed with the untreated one in drains.
4. Treated waste must the regularly monitored and Standards be strictly enforced.
5. Lastly to educate the people about the value of water resource and how it can be properly managed.
6. Stabilization of the ecosystem.
7. Reutilization and recycling of waste.
8. Removal of pollutants.

#### **Soil Pollution**

Soil contamination or soil pollution as part of land degradation is caused by the presence of xenobiotic chemicals or other alteration in the natural soil environment. It is typically caused by industrial activity, agricultural chemicals or improper disposal of waste. Land pollution is the degradation of earth's land surfaces often caused by human actives and its misuse. Haphazard and disposal of urban and industrial waste, exploitation of minerals and improper use of soil by inadequate agricultural practices are a few of the contributing factors. Also increasing urbanization, industrialization and other demands on the environment and its resources is of great consequences to many countries.

#### **Sources and Cases of Land Pollution**

Land pollution is caused by both natural factors and human activities. The natural factors that cause soil erosion include volcanic eruptions, changes in rainfall patter, earthquakes, topographic changes, and wind and glacier movements.

1. The main factors of land pollution are increasing rate of soil erosion caused due to deforestation.
2. In most of the developing countries increasing rate of soil erosion due to deforestation and faulty agricultural practices had degraded land to a large scale because the fertile top soil has been washed out.
3. The excrete of birds, animals and human's are source of soil pollution by biological agents. Sewages used as manure causes soil pollution.
4. Acid rains increase the acidity of soil that is injurious to plant growth. It is caused by the presence of pollutants in the environment. The major causes of acid rains include human activities such as burning of fossil fuels, and introduction of harmful gases.
5. The nuclear power plants are responsible for producing radioactive wastes. These are harmful further soil

#### **Harmful Effects of Land Pollution**

1. Land pollution result in substantial decrease in soil fertility and agricultural production.
2. Those bacteria which are transmitted to human being from soil infect causes dysentery, cholera, tuberculosis, typhoid and Para typhoid fever etc.
3. The decomposition of various waste materials causes harmful gases and bad smell.
4. Clogging of micro-holes of the soil by particles in the sewage destroy the soil micro-organisms.

5. Land pollution is one of the main causes of air and water pollution.

**Control of land Pollution**

1. Soil erosion should be checked.
2. Proper disposal of industrial and urban wastes.
3. After proper treatment of the urban and industrial effluents should be used for irrigation purposes.
4. Proper land use and management.
5. Proper use of fertilizers and biocides.

**Control of Pollutions in the country**

The various Acts one -

1. The water (prevention and control of pollution) Act, 1974.
2. The air (prevention and control of pollution) Act, 1981
3. The environment (protection) Act, 1986
4. The Motor vehicles Act, 1988

Besides these public must be made aware and educate about pollution through adequate news media, lectures and other programmes. Then pollution can be controlled and the life of human being on Earth will be long and healthy.

**Aim of the Study**

The overall aim of this study is to reduce pollution in order to decrease the detrimental impact on environment and thereby to facilitate sustainable management of nature resource and avoid negative effect on human health.

**Review of Literature**

Environmental pollution has become a major concern of developing countries in the last few decades. Pollution of water and soil by heavy metal is emerging problem in urban industrialized countries. The wide spread industrialization in urban areas has drastically reduced land areas for waste disposal. Disposal of untreated industrial and domestic wastes into the environment affects both soil and ground water quality. Our careless dumping of wastes has affected these precious resources (Quazilbash et al 2006). Maiti and agrawal (2005) reported some of the important environmental problem caused by over population growth.

Pollution is defined in various ways. It is considered on the release of unwanted substance to the environment by man in quantities that damage either the health or the resource itself. (2007)

Mansha and Foster (1967) reported that due to increased concerns about the effects of air pollution both people and materials many countries have introduced legislation designed to control the amount of pollution in the air.

Gautam et al (1998) reported that air pollution become acute in atmosphere. Panda and kar (2003) reported that pollution in Rajasthan in the mine area. Air pollution was controlled by afforestation. Mrinal et al (2005) reported that the public health implications of vehicular emission were substantiated. Michel hall and juli (2003) suggested that the climate and health connection.

In the survey conducted by the central pollution control board, there were 2000 large and medium scale industries in the country which polluted the ground water. Schueler and hall (2000) suggested

that the effects of urbanization on the water cycle can be major.

Purandara et al (2003) reported the with the rapid growth of population and industrialization in the country. Pollution of natural water by municipal and industrial waste increased tremendously.

Soil is the natural medium for the growth of land plants agriculture plays a key role in the development of any economy. Soil erosion is caused by wind on water. Erosion causes depletion of fertility through the removal of valuable and fertile surface soil (anon, 2004). Salinity in soil hinders crop growth and results in reduction in crop (anon 2004).

A study has been done on the nature of air pollution, emission source management in the different cities of India. (Atms env 2014). A critical analysis is reported on air pollution and related health issues. Human health is very much affected due to environment pollution (report 2015). A survey has been done in different cities of India and a result is concluded that a million people were killed in 2015 due to environmental problems. (Science news org, 2017).

**Conclusion**

Consumerism has increased enormously raised on standard of living with growing human population and growing need of modern era of development, it results in pressure on our resources. Forest cutting, release of toxic gases to atmosphere, dumping of liquid waste into sea, rivers and lakes etc. Polluted our environment.

Water is an essential element for many living species and its pollution is threatening to many biological communities and ecosystem, the effect of water pollution is devastating as it is a leading cause of death and diseases world wide, but not only human, other species and ecosystem also air pollution produce health problem and damage of environment.

Any development which can not provide clean air and safe water to it's people can not be useful and functional for any country. To reduce any type of pollution is not a single or a few days work; it requires steady and continuous efforts of every one. We should save our environment and reduce pollution at any cost to provide safe and clean environment to coming generation.

**References**

1. *Water, Air, Soil Pollution: An International journal of Environmental pollution. ISSN: 0049-6979 (Print).*
2. *"Air, Water & Soil pollution ; " K.K.Singh, Asha Juwarkan, A.K. Singh, Alka Tomar*
3. *"Soil and Water contamination" Marcel Vander Perk CRC Press Book*
4. *"Water pollution, causes, effects and solutions" Dr. Laxmy Begum, P. Eng.*
5. *"Ecology and Environment" P.D.Sharma*
6. *"Status of sewage treatment in India" Central Pollution Control Board, Ministry of Environment & Forest, Govt. of India.*
7. *"Fundamentals of air pollution" Daniel A Vallero, 2007.*

8. "Air Pollution control technology" Hand Book, Karls, Schnell, 2001.
9. "Air Pollution reference, mesurement, methods and system, Elevier, T-sneider, H.W., Dekoning, L.J. Braosen 2011".
10. Guttikunda S.K. Goel R, Pant P, "Nature of air pollution emission source and management in the Indian cities" Atmos Enviroment, 2014. (501-10)
11. Ministry of health & family welfare, Government of India, report of the steering committee on air pollution and heath related issues, 2015
12. Beil Laura, "pollution killed a million people in 2015" science news, org dec 2017.