

# Water Pollution



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## Abstract

Water pollution is a world major problem and it is likely to effect the human health of populations. This paper provides the insight view about the categories, affects and Source of water pollution in the perspective of Water pollution is the contamination of water bodies (e.g., rivers, lakes aquifer, oceans, and groundwater) pollution on human by diseases and health problems, animals and plants. Study finds that these kinds of water pollutions are not only seriously affecting the human by diseases and problems but also the animals and trees/plants. According to author, still time left in the hands of global institutions, governments and local bodies to control water pollution use the advance technique for Thermal pollution, Sewage water Treatment, Nutrients, Sewage can be 1 good Fertilizer It return important nutrients to the environment, witch plants and animals need for growth. Live friendly with environment.

**Keywords:** Water Pollution, Pollutant, Biosphere, Water Bodies, CWA, Sewage, Mining, Oil Leakage, Globalwarming, Radioactive Waste, Pesticides, Animal Waste, Pathogens, Organic, Inorganic, Thermal, Nutrients.

## Introduction

Water pollution is due to present of pollutants in the water bodies (e.g. rivers, oceans, lakes, aquifer and ground water). Environmental degradation occurs when pollutants are directly or indirectly released into water bodies without removal of harmful compounds. Water pollution affects the entire biosphere-plants and organisms which living in the water bodies. In almost all cases the effect is damaging not only to individual species and population, but also to the natural biological communities.

We can say Water is life line. About 70% of the earth's surface is cover by water, it beyond doubt becomes one of our important resources. As a students, we should knowledge about the various ways to conserve water. As we know water is used in almost every important human activity and industrial processes. It is an important element in both domestic as well as industrial purposes.

Waste ranging from floating plastic bags, bottles to chemical waste coming from industries, our water bodies have turned in to a pool of poison. The contamination of water bodies is known as water pollution. Pollution of water occurs when untreated water is discharged into water bodies. These pollutants can be discharge directly as well as indirectly.

## Aim of the Study

The aim of the study of water pollution is contamination of water bodies, usually as a result of several human activities. Water bodies rivers, oceans, lakes, aquifers and groundwater. Water pollution occurs when contaminants are introduced into the natural environment. For example, releasing untreated wastewater into natural water bodies which can lead to degradation of aquatic ecosystems. Which can lead to public health problems for people living downstream. They may utilize the same polluted river water for drinking or bathing or irrigation purpose. Water pollution is increasing worldwide cause of death and disease, e.g. due to water-borne diseases.

Water pollution is horrible problem, powerful enough to lead the world on a path of destruction. Water is an easy polarsolvent, allowing most pollutants to dissolve in it easily and contaminate it.

Water pollution is directly affect the living organisms and vegetation which survive in water, including amphibians. Many people die every day due to consumption of polluted and infected water.

According to the Economist report every day over 1000 children die due to water borne disease in India. Water is polluted due to both natural as well as human activities, volcanoes, storm, and earthquakes etc. are known to alter water and contaminate it, also affecting eco systems and lives that survive under water.

Water pollution is a major problem for the world which requires regularly evaluation and revision of water resource policy at all. Water pollution is the leading worldwide cause of deaths and diseases, and that it accounts for the deaths of more than 14,000 people daily. An approx. 580 people in India die due to water borne disease. About 90% of the useable water is polluted in the cities of China. In 2007, 5 lakh Chinese had no access to safe drinking water. The problems of water pollution is major problem in developing countries, developed countries also continue to struggle with water pollution problems. In recent national report on water quality in the United States, 44 % of assessed stream miles, 64 % of assessed lakh acres, and 30 % of assessed bay and estuarine square miles were polluted. The chief of China's national development agency said in 2007 that one quarter the length of China's seven main rivers were so poisoned the water badly affect the human and animal skin and living organism (in sea and river) skin. Water is called polluted when it is spoiled by anthropogenic contaminants and either it does not support a human use, such as drinking water and by not providing living environment to living organism. Natural phenomena like volcanoes, storm, and earthquakes etc., also cause major changes in water quality and the ecological status of water.

Surface water and groundwater studied and managed as separate resources of water. Water that seeps through the soil and mix in ground water table becomes groundwater. Groundwater can also charge through surface water sources. Sources of surface water pollution are generally classified into two categories based on their origin.

#### **Point Sources**

Point source of water pollution is a single, identifiable source, such as a pipe or ditch coming from sewage treatment plant. For Examples sources in this category include discharges waste water from a sewage treatment plant, a factory, city storm drain.

The CWA definition of point source was amended in 1987 to include municipal storm sewer system and industrial storm water coming from construction sites.

#### **Non-Point Sources**

Nonpoint source pollution refers to diffuse contamination that does not originate from a single source. NPS pollution is the cumulative effect of small amounts of contaminants gathered from a large agricultural area. For example the leaching out of nitrogen from fertilized agricultural lands. Nutrient runoff in storm water from "sheet flow" over an agricultural field or a forest are also cited as examples of NPS pollution. Contaminated storm water washed off of waste on roads and highways, called urban runoff, it comes under the category of NPS pollution. However if this runoff is typically channelled in to storm drain systems and discharged through pipes to local surface waters then it becomes a point source.

#### **Causes of Water Pollution**

Let us now study the causes of water pollution.

1. **Industrial Waste:** Industries produce huge amount of waste which contains toxic chemicals

and pollutants which can cause air pollution and damage to us and our environment. They contain pollutants such as lead, mercury, sulphur, asbestos, nitrates and many other harmful chemicals. Most of the industries have improper waste management system and they release the waste into fresh water which goes into rivers, canals and further in the sea. These toxic chemicals have the capability of producing odour in water and change the colour of water, increase the amount of minerals, which is known as Eutrophication, and increase in temperature of water and cause serious hazard to water organisms.

2. **Sewage and waste water:** The sewage and waste water that is produced by each house hold is chemically treated and released in to sea with fresh water. These waste water carried harmful bacteria and chemicals that can cause serious health problems. Pathogens are known as a common water pollutant; the sewers of cities house several pathogens and there by diseases. Microorganisms in water are known to because s of some very deadly diseases and become the breeding grounds for other creatures that act like artier s. These carriers inflict these diseases via various forms of contact into an individual. A very common example of this process would be Malaria.
3. **Mining activities:** Mining is the process of crushing the rock and extracting coal and other minerals from underground. These elements when extracted in the raw form contains harmful chemicals and can increase the amount of toxic elements when mixed up with water which may result in health problems. Mining activities emit several metal waste and sulphides from the rocks and is harmful for the water.
4. **Marine dumping:** The garbage produce by each household in the form of paper, aluminium, rubber, la, plastics, food if collected and deposited into the sea in some countries. These items take from 2 week to 200 year to decompose. When such items enters the sea, they not only cause water pollution but also harm animals in the sea.
5. **Accidental Oil leakage:** Oil spill pose a huge concern as amount of oil enters into the sea and does not dissolve water; there by opens problem for local marine wild life as fish, birds and sea otters. For e.g. : a ship carrying large quantity of oil may spill oil if met with an accident and can cause varying damage to species in the ocean depending on the quantity of oil spill, size of ocean, toxicity of pollutant.
6. **Burning of fossil fuels:** Fossil fuels like coal and oil when burnt produce substantial amount of ash in the atmosphere. The particles which contain toxic chemicals when mixed with water vapour result in acid rain. Also, carbon dioxide is released from burning of fossil fuels which result in global warming.
7. **Pesticides and Chemical fertilizers:** Pesticides and Chemical fertilizers are utilized by farmers to

protect crops from insects and bacteria and increase production also eliminating weed side. When it rains, the fertilizer and chemicals mixes up with rain water and flow along and go down in to rivers and canals which cause serious damages for aquatic animals.

8. **Leakage from sewer lines:** A small leakage from the sewer line can contaminate the underground water and make it unfit for the people to drink. Also, when not repaired on time, the leaking water can come on to the surface and become a breeding ground for insects and mosquitoes.
9. **Global warming:** An increase in earth's temperature due to greenhouse effect results in global warming. It increases the water temperature and result in death of aquatic animals and marine species which later results in water pollution.
10. **Radioactive waste:** Nuclear energy is produced using nuclear fission or fusion. The element that is used in production of nuclear energy is Uranium which is highly toxic chemical. The nuclear waste that is produced by radioactive material needs to be disposed of to prevent any nuclear accident. Nuclear waste can have serious environmental hazards if not disposed of properly. Few major accidents have already taken place in Russia and Japan.
11. **Urban development:** As population has grown, so has the demand for housing, food and cloth. As more cities and towns are developed, they have resulted in increased use of fertilizers to produce more food, soil erosion due to deforestation, increase in construction activities, in adequate sewer collection and treatment, landfills as more garbage is produced, increase in chemicals from industries to produce more materials.
12. **Leakage from the landfills:** Landfills are nothing but huge pile of garbage that produces awful smell and can be seen across the city. When it rains, the landfills may leak and the leaking land fill can pollute the underground water with large variety of contaminants.
13. **Animal waste:** animal waste is generated by animal dead bodies or by their waste. Generally it is wash away in rivers that cause various water borne disease like cholera, diarrhea, jaundice, dysentery and typhoid.
14. **Underground storage leakage:** transportation of petroleum products through underground pipelines is widely used. Accidental leakage may happen any time and may cause damage to environment because this petroleum product mix in water table and pollute ground water table
15. Irrigation water having high amount of ammonia after use in fertilizer in fields will further mix in ground water table and pollute ground water table

Water pollutants may have two categories organic and inorganic, organic are they which have volatile organic compound and inorganic these coming from factories

Since water is resource to us hence nowadays we are making several efforts to redeem our water resources it is strictly advised to factory and industries to treat the contaminant waste through filtration methods.

People are investing in rain water harvesting projects to collect rain water and preserve it in wells below ground level. Water Pollution is common, and is an area of high alert. Water needs to be preserved and respected today, for us to live a tomorrow.

#### **Pathogens**

Disease-a using microorganisms are referred to as pathogens. Although the vast majority of bacteria are either harmless or beneficial, a few pathogenic bacteria can cause disease. Coliform bacteria, which are not an actual cause of disease, are commonly used as a bacterial indicator of water pollution. Other microorganisms sometimes found in surface waters that have caused human health problems include:

1. Borehole *Dariapseudo mallei*
2. *Cryptosporidium partum*
3. *Giardia labia*
4. *Salmonella*
5. Nor o virus and other viruses
6. Parasitic worms including the Schist soma type

High level so pathogens may result from on-site sanitation systems (septic tanks, pit latrines) or inadequately treated sewage discharges. This can be caused by a sewage plant designed with less than secondary treatment (more typical in less -developed countries. in older cities where sewage system are old, aged infrastructure have a problem of leakage in sewage system (pipe, pumps, walls). Old sewage system cannot use now days because population have been increased due to which waste is generated more due to which sanitary sewer over flow , some cities has combined sewage which may overflow in rainy season due to this water remain untreated hence it pollutes water bodies .

Pathogen discharges may also be caused by poorly managed livestock operations. Organic, inorganic and macroscopic contaminants

**Contaminants may include organic and inorganic substances.**

#### **Organic water pollutants include:**

1. Soap & Detergents: detergents are more pollutants than soap
2. Food processing waste: fats and grease which can include oxygen demanding substances,
3. Insecticides and herbicides: a huge range of organic alkyl halides and other chemical compounds
4. Petroleum: hydrocarbons which contains fuels (gasoline, diesel fuel, jet fuels, and fuel oil) and lubricants (motor oil), and fuel combustion by products, from storm water run off
5. Chlorinated solvents, which are dense non-aqueous phase liquids, since they don't mix well with water and denser. OTrichloroethylene, o Polychlorinated biphenyl (PCBs)
6. Perchlorate
7. different organic chemical compounds found in personal hygiene, beauty and cosmetic products

8. Drug pollution: organic pollutants are found in pharmaceutical drugs and their metabolites

#### **Inorganic water pollutants include**

1. Acidity due to industrial discharges (especially sulphur dioxide from power plants)
2. Generation of Ammonia from food processing waste
3. Chemical waste substances coming from industrial by-products
4. Fertilizers containing nutrients-nitrates (urea) and phosphates which are found in rain water runoff from agriculture field, as well as commercial and residential utilize.
5. Heavy metals like mercury, lead etc. from motor vehicles (via urban rain water runoff) and acid mine drainage.
6. Silt (sediment) is drained out from construction sites.
7. Floatables are microscopic pollutants, they are large visible items polluting the water. They may be found in open seas and rivers
8. Trash or garbage that are thrown on ground which further flow in rain water and eventually discharge into surface water resource

#### **Thermal Pollution**

Thermal pollution is increase and decrease in temperature in water bodies it is happen due to human activities due to thermal pollution water physical properties are changed.

A general cause of thermal pollution is using water as a coolant in power plants and industries manufacturers. Top surface of water temperature can decrease the oxygen level in water and that can kill fish and alter the food chain composition.

Thermal pollution can also happen due to release of cold water coming from base of reservoirs into warmer rivers.

#### **Sewage**

Billions of people produce sewage in this planet so its major cause of water pollution. According to world health organization 663 million people do not have access of safe water and 2.4 billion not have proper sanitization facilities improper sewage treatment, improper sewage disposal cause many water borne disease like diarrhoea that can kill 525000 children under five year

#### **Conclusion and Recommendations**

Water pollution is a global issue and world community is facing worst results of polluted water. Major sources of water pollution are discharge of domestic and agriculture wastes, Industrial waste, Sewage, mining activities, Marine dumping ,Oil leakage, Burning of fossils Chemical fertilizer and pesticides ,Global warming, Radioactive waste, population growth, urbanization. Leakage from the landfills, Animal waste, Bacterial, viral and parasitic diseases are spreading through polluted water and affecting human health. It is recommended that there should be proper Management of waste disposal system and waste should be treated before entering in to river. Enforcement of Pollution control Act .strictly. Educational and awareness programs should be organized to control the Water pollution.

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