

Effect of Water Pollution on Human Health: A Critical Analysis

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Abstract

Water covers about 70% Earth's surface. Safe drinking water is a basic need for all humans. The WHO reports that 80% diseases are waterborne. Industrialization, discharge of domestic waste, radioactive waste, population growth, excessive use of pesticides, fertilizers and leakage from water tanks are major sources of water pollution. These wastes have negative effects on human health. Different chemicals have different effects depending on their locations and kinds. Bacterial, viral and parasitic diseases like typhoid, cholera, encephalitis, poliomyelitis, hepatitis, skin infection and gastrointestinal are spreading through polluted water. It is recommended to examine the water quality on regular basis to avoid its destructive effects on human health. Domestic and agriculture waste should not be disposed of without treating.

Keywords : Water, Pollution, Harmful, Chemicals, Diseases.

Introduction :

Water pollution occurs when unwanted materials enter in to water, changes the quality of water and harmful to environment and human health. Water is an important natural resource used for drinking and other developmental purposes in our lives. Safe drinking water is necessary for human health all over the world. Being a universal solvent, water is a major source of infection. According to world health organization (WHO) 80% diseases are water borne. Drinking water in various countries does not meet WHO standards. 3.1% deaths occur due to the unhygienic and poor quality of water.

Access to safe drinking water is vital for human health, food security and socio-economic development. Currently, WHO and UNICEF reported that 1.1 billion peoples in the world lack access to better water supplies and 2.6 billion peoples lack sufficient sanitation conditions (Unicef, 2004). The global health issues related to these conditions are confounding, with an estimated 4–6×10 children dying each day from diseases linked with poor hygiene, inadequate sanitation, and lack of clean and safe drinking water. Ensuring reliable access to safe and clean water is currently one of the greatest global challenges especially in Asia where an estimated 675 million peoples are without safe drinking water sources (Unicef et al., 2004).

It is a well-known fact that clean water is absolutely essential for healthy living. Adequate supply of fresh and clean drinking water is a basic need for all human beings on the earth, yet it has been observed that millions of people worldwide are deprived of this. Freshwater resources all over the world are threatened not only by over exploitation and poor management but also by ecological degradation. The main source of freshwater pollution can be attributed to discharge of untreated waste, dumping of industrial effluent, and run-off from agricultural fields. Industrial growth, urbanization and the increasing use of synthetic organic substances have serious and adverse impacts on freshwater bodies. It is a generally accepted fact that the developed countries suffer from problems of chemical discharge into the water sources mainly groundwater, while developing countries face problems of agricultural run-off in water sources. Polluted water like chemicals in drinking water causes problem to health and leads to water-borne diseases which can be prevented by taking measures can be taken even at the household level.

Water is a basic human need required for drinking, cooking, and cleaning. It is also heavily used in industry, agriculture, and electricity. While the importance of water is undeniable, many companies and people continue to pollute our oceans, rivers, and lakes with harmful toxins and contaminants. In turn, water pollution has become a major crisis in countries across the globe, affecting millions of people worldwide. Water pollution has many causes, starting with rapid urban development. As houses and roads are built and factories grow, many people will dump their waste into bodies of water, causing pollution. In homes, families are guilty of contributing to pollution by pouring detergents and chemicals down toilets and drains. Other common causes of water pollution include the use of harmful fertilizers by farmers, improper sewage disposal, discharge of radioactive wastes, oil spills, and throwing plastics in the river.

The effects of water pollution on human health have been well documented. Polluted water contributes to water scarcity in many countries that do not have the systems in place to enforce against it. This causes many men, women, and children in third-world countries to be exposed to polluted water on a day-to-day basis. This then forces countless families to regularly consume contaminated water, often leading to illness.

Discharge of domestic and industrial effluent wastes, leakage from water tanks, marine dumping, radioactive waste and atmospheric deposition are major causes of water pollution. Heavy metals that disposed off and industrial waste can accumulate in lakes and river, proving harmful to humans and animals. Toxins in industrial waste are the major cause of immune suppression, reproductive failure and acute poisoning. Infectious diseases, like cholera, typhoid fever and other diseases gastroenteritis, diarrhea, vomiting, skin and kidney problem are spreading through polluted water. Human health is affected by the direct damage of plants and animal nutrition. Water pollutants are killing fishes, and other water organisms that serve as food for human. Insecticides like DDT concentration is increasing along the food chain. These insecticides are harmful for humans.

Major sources of water pollution :

It is reported that 75 to 80% water pollution is caused by the domestic sewage. Waste from the industries like, sugar, textile, electroplating, pesticides, pulp and paper are polluting the water. Polluted river have intolerable smell and contains less flora and fauna. 80% of the world's population is facing threats to water security.

Large amount of domestic sewage is drained in to river and most of the sewage is untreated. Domestic sewage contains toxicants, solid waste, plastic litters and bacterial contaminants and these toxic materials causes water pollution. Different industrial effluent that is drained in to river without treatment is the major cause of water pollution. Hazardous material discharged from the industries is responsible for surface water and ground water contamination. Contaminant depends upon the

nature of industries. Toxic metals enter in to water and reduced the quality of water. 25% pollution is caused by the industries and is more harmful.

Increasing population is creating many issues but it also plays negative role in polluting the water. Increasing population leads to increase in solid waste generation. Solid and liquid waste is discharged in to rivers. Water is also contaminated by human excreta. In contaminated water, a large number of bacteria are also found which is harmful for human health. Sanitation facilities are more in urban areas than rural areas. Polythene bag and plastic waste is a major source of pollution. Waste is thrown away by putting it in to plastic bags. It is estimated that three core people of urban areas defecate in open. Urbanization can cause many infectious diseases. Overcrowding, unhygienic conditions, unsafe drinking water are major health issues in urban areas. One quarter of urban population is susceptible to disease.

Pesticides are used to kill bacteria, pest and different germs. Chemical containing pesticides are directly polluting the water and affect the quality of water. If pesticides are excess in amount or poorly managed then it would be hazardous for agriculture ecosystem. Only 60% fertilizers are used in the soil other chemicals leached in to soils polluting the water, cyanobacteria are rich in polluted water and excess phosphate run off leads to eutrophication. Residues of chemicals mix with river water due to flooding, heavy rainfall, excess irrigation and enter in the food chain. These chemicals are lethal for living organisms and many vegetables and fruits are contaminated with these chemicals. Trace amounts of pharmaceutical in water also causes water pollution and it is dangerous to human health.

Methods :

The method used in this paper is descriptive-evaluative method. The study is mainly review based. It is purely supported by secondary source of data, i.e. books, journals, papers and articles and internet.

Objective of the study : The research paper is based on following objectives:

- To Examine the effect of water pollution on human health.
- To investigate the water pollution and water born disease.

Review of Literature :

Review of related literature is an important research effort as it provides comprehensive understanding of what is already known about the topic. It helps to avoid duplication of what has already been done, and provides useful directions and helpful suggestions for research work. Many workers have reported the status of water bodies after receiving various kinds of pollutants altering water quality characteristics.

Amita et al., (2005) Besides these, chemicals such as zinc chloride, mercuric chloride and formaldehyde are used as disinfectants, sodium chloride in curing and as bleaching powder and sodium fluoride to prevent putrefaction, lime in liming, sodium sulphate, ammonium chloride, borax and hydrochloric acid in declaiming, sodium for decreasing and basic or acidic dyes in leather finishing

Verma et al., (2007) About 20-30 litres of effluent is discharged per kilogram of skin/hide processed, and in the case of finishing units, this quantity is about 40 liter per kilogram of skin/hides.

Tudunwada et al., (2007) Various chemicals used in tanning are lime, sodium carbonate, sodium bi-carbonate, common salt, sodium sulphate, chrome sulphate, fat liquors, vegetable oils and dyes.

Parthasarathi et al., (2008) The typical soil derived from the Deccan trap is the regur or black cotton soil. These soils vary in depth from shallow to deep. It is common in Maharashtra, western parts of Madhya Pradesh, parts of Andhra Pradesh, parts of Gujarat and some parts of Tamil Nadu. Many black soil areas have a high degree of fertility. They are darker, deeper and richer and are constantly enriched by the additions washed down from the hills. In the uplands, these are poor, light-colored and thin. Black soils are fine-grained and dark and contain a high proportion of calcium and magnesium carbonates. These soils have high plasticity and stickiness. They are very tenacious and exceedingly sticking when wet. Due to poor drainage of excess water, water logging conditions occur in these soils, hence proper drainage should be provided to minimize the damage caused due to excess water. Frequent irrigation prevents the development of small cracks and tearing of roots of the soil. Legumes should be used as rotation crops to improve the productive capacity of the soil.

Karthikeyan et al., (2010) The industrial effluents consist of organic compounds along with inorganic complexes and other non biodegradable substances. These pollutants not only alter the quality of ground water and soil but also pose serious problems.

Effects of Water Pollution on Human Health :

There is a greater association between pollution and health problem. Disease causing microorganisms are known as pathogens and these pathogens are spreading disease directly among humans. Many water borne diseases are spreading man to man. Heavy rainfall and floods are related to extreme weather and creating different diseases for developed and developing countries. 10% of the population depends on food and vegetables that are grown in contaminated water. Many waterborne infectious diseases are linked with fecal pollution of water sources and results in fecal-oral route of infection. Health risk associated with polluted water includes different diseases such as respiratory disease, cancer, diarrheal disease, neurological disorder and cardiovascular disease. Nitrogenous chemicals are responsible for cancer and blue baby syndrome. Mortality rate due to cancer is higher in rural areas than urban areas because urban inhabitants use treated water for drinking while rural people don't have facility of treated water and use unprocessed water. Poor people are at greater risk of disease due to improper sanitation, hygiene and water supply.

Poor quality water destroys the crop production and infects our food which is hazardous for aquatic life and human life. Pollutants disturb the food chain and heavy metals, especially iron affects the respiratory system of fishes. An iron clog in to fish gills and it is lethal to fishes, when these fishes are eaten by human leads to the major health issue. Metal contaminated water leads to hair loss, liver cirrhosis, renal failure and neural disorder.

Bacterial diseases :

Untreated drinking water and fecal contamination of water is the major cause of diarrhea. Disease cholera is caused by the contaminated water.

Viral diseases :

Hepatitis is a viral disease caused by contaminated water and infects the liver. Jaundice, loss of appetite, fatigue, discomfort and high fever are symptoms of hepatitis. If it persists for a long time it may be fatal and results in death. Gastroenteritis is caused by different viruses including rotaviruses, adenoviruses, calciviruses and Norwalk virus.

Parasitic diseases :

Cryptosporidiosis is a parasitic disease caused by the cryptosporidium parvum. It is worldwide disease and symptoms are diarrhea, loose or watery bowls, stomach cramps and upset stomach. Cryptosporidium is resistant to disinfection and affects immune system and it is the cause of diarrhoea and vomiting in humans.

Conclusion:

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, population growth, excessive use of pesticides and fertilizers and urbanization. Bacterial, viral and parasitic diseases are spreading through polluted water and affecting human health. This study has reflected the fact that water contamination is posing serious threats to the human health. This might be due to the lack of awareness, time and resources. Moreover, it was concluded from this study that waterborne diseases were even found in those areas, where no microbial contamination was detected, so in future a detailed study should be carried out about this aspect. It is recommended that there should be proper waste disposal system and waste should be treated before entering in to river. Educational and awareness programs should be organized to control the pollution.

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