

Roots of water pollution, its impacts on human health and avoidance of it a review.

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Abstract: Water is essential for every living organism; it gets polluted by some human activities such as industrial activities and agricultural activities. Water is affected by different types of pollutants in India. The current stage, untreated water affects the environment of earth. In this paper a detailed study of sources responsible for water pollution is covered. Mainly industrial pollutants, agricultural runoff, sewage discharge are responsible factors for water pollution. Some physical and chemical parameters get changed because of these factors which affect the quality of water and make it unsafe for human consumption. This paper also covers the impact of this polluted water on the human body and diseases caused by use of this water. And avoidance technique of the water pollution is also discussed in this paper.

KEY WORDS: Human Health, water borne disease, Physico Chemical Testing, Source of water pollution,

I. INTRODUCTION

Water, soil and air are the valuable gifts from mother nature which is very essential for every organism to survive. Study of the physico chemical parameters of the major dams in Ekiti state of Nigeria by. Adefemi et al.[1]. has pointed out the presence of metal impurities in the different waterbodies by several human activities and the consumption of this by fauna and flora and human beings has a drastic impact.[2] Ipinmoroti and Oshodi,1993; Vogel, 1970. Pointed out the method for removing the sulphate-based fertilizers into river [3]. The method of calculation for the standard deviation, mean and coefficient of variation was described by Steel and Torrie (1960) [4]. Asaolu et al., 1997; Asaolu, and Olaofe, 2004; Nwajei and Gagophien, 2000 reported that iron occurs at high concentration in Nigeria soil.[5] Official method of analysis for determination of physicochemical parameters was given by (AOAC 2005).[6]

Soumya Haldar et al studied the water pollution for the Sabarmati River in the year of 2013. In the studies carried out by Phiri et al. 2005 revealed that most of the waste water runoff is from the urban areas industries and sewage system. [7] Jain et al.2007 reported that physico chemical and biological parameters of surface water bodies are affected from industrial, growth, urbanization, agriculture, and higher demand of the energy [8]. Sampat 1996 reported that unhealthy water increases the waterborne diseases [9]. Based on the data Status of Water Quality in India 2007 Sabarmati is second polluted river by receiving the municipal, industrial, and other wastes [10], this Literature survey was given by Datta 1983. Mishra et al. 2010; Panchani and Pandya 2013 quantified the load of pollution in Sabarmati River [11][12]. Kumar et al. 2011 assessed the physicochemical properties of the Sabarmati water, from July 2009 to April 2010 [13]. Bhutiani and Khanna 2007 gives the pattern to measure BOD of Sabarmati River [14]. Mahapatra et al. 2012. gives the data of the physicochemical parameters of the river water were subjected to correlation analysis [14].

Swayam Siddhaand Paulami Sahu (2018) assessed the groundwater potential of Gandhinagar Region, Gujarat [15]. In their study stated that the water is most important source of water supply [16]. (Foster, 2000; Hiscock et al., 2002; Sophocleous, 2005) population growth urbanisation and human activities are responsible for ground water pollution [17] [18]. Reddy et al., 1996 reported that in India, more than 90% of the rural and nearly 30% of the urban population depend on groundwater for meeting their drinking and domestic needs [20]. Garg and Hassan,2007; Rodell et al., 2009; Tiwari et al., 2009 reported the consequences of water scarcity and over-exploitation of groundwater resources are common in several parts of India [21]. Wenzel and Blum, 1992; Bardsen et al., 1996) reported dissolved fluorides-based impurities in ground water from the rock source [22]. Chowdhury et al., 2009 stated that the Remote sensing (RS) and Geographic Information Systems (GIS) are the valuable tools [22]. Based on report of (Dunning et al., 2000; Flug et al., 2000; Joubert et al., 2003; Machiwal et al., 2011; Adiat et al., 2012; Mallick et al., 2014) (MCDM) endeavours water resource management by including structure, auditability, transparency, and accuracy to decisions.[23],[24],[25].

SOURCES OF WATER POLLUTION

Water gets polluted by many sources but following three are the major sources of the water pollution

1. Industrial activities
2. Sewage discharge
3. Agricultural runoff

Romeo Singh and Asha Gupta (2016) studied the water pollution-sources, effects and control in her research [26] Carpenter et al., 1998 Pointed out the characteristics of point and nonpoint sources of chemical inputs to receiving waters. [27]. (Paul and Meyer, 2001), stated that urbanization generally leads to higher phosphorus concentrations in urban catchments. [28].

II. ROOTS OF WATER POLLUTION

INDUSTRIAL ACTIVITIES

Industrial operations: As effluents, acids, alkalis, dyes, and other chemicals are deposited and discharged into rivers by industrial operations. Fluorides are widely released into the environment by chemical industry. Large amounts of ammonia are produced by the fertilizer industry, while cyanide is produced by steel mills. In industrial processes, chromium salts are utilized to produce compounds containing chromium, such as sodium dichromate. When such wastes reach waterbodies, they impact both human health and the local organisms.

SEWAGE DISCHARGE

Sewage discharged water is consist of urine and water from washing and bathing. Sewage water contains organic and inorganic materials as pollutants it contains 90% of water with 0.1% solid substances. Some of the pollutants gets dissolved in water which contains carbohydrates lignin proteins and their decomposed product. Some heavy metals (zinc, magnesium, arsenic etc. soluble in water as pollutants.

AGRICULTURAL ACTIVITIES

Waterbodies near farms are pesticide rich and many pesticides such as Aldrin, Dieldrin, Malathion, DDT, Hexachlorobenzene etc, are mixed with the waterbodies and make the water contaminated. This contamination make water unhealthy and causes many diseases if consume directly by human or any other organisms.

Suaad Hadi Hassan Al-Taai (2021) studied the causes and impact of water pollution in which Baya B (2008) reported the causes water pollution and its suitability factors for use and water pollution. [36]. Rashid S (2017) stated the sources, meanings and effects of environmental pollutants.[37] Badran A (1988) studied the thermal water pollution by power station which cause high temperature imbalance into the water. [38] Ewaid, et al (2017) reported the physical water pollution: in this type of water pollution some organic and inorganic material mixed with water and caused changes in water such as change in smell, temperature, colour, taste of original water. [39]. Ewaid, et al (2019) reported the chemical water pollution excessive amounts of dissolved salts, acids, fluorides, metals, organic materials, fertilizers and pesticides causes this type of water pollution.[40]. Because of this pollution the lakes face premature aging and turns into dry land and also gives information about chemicals found in water as pollutants.

III. IMPACTS OF POLLUTION ON HUMAN HEALTH

Healthy water is an essential source for every living organism. If the unhealthy water consumed by living organisms it causes big damage to body. If human uses this water, it causes so many diseases. Many people carried out research on the impact of water pollution on human health.

In the year (2017) Sidra Arshad et al investigated about water pollution and human health. In their research Kamble SM. (2014) pointed out diseases caused by microorganisms known as pathogens. [41] Halder JN, Islam MN (2015) stated that many waterborne diseases spreads man to man. [42] According to Corcoran E, et al (2010) 10% population are depending upon the food grown in contaminated water. [43] Nel LH, Markotter W (2009) stated that the water borne diseases and infection are linked with fecal pollution of water sources and results in fecal-oral route of infection. [44]. Ullah S et al (2014) reported the health risks and the disorders by using the polluted water. [45] Krishnan S, Indu R (2006) gave the information about diseases caused by water containing nitrogenous chemicals, which is cancer and blue baby syndrome. [46] Jabeen SQ, Jabeen SQ et al (2011) stated that

Mortality rate due to cancer is higher in rural areas than urban areas because in urban area people use the treated water while people of rural areas don't have facility to treat water and make it chemicals free [47]. Currie J et al (2013) gave the information about the effects of water pollution on pregnant woman it increased rate of low birth weight as a result fetal health is affected [48]. Khan MA, et al (2011) reported the effects of water pollution in crops which affects the human health. [49] Ahmed T, Scholz F (2013) gave the information about the heavy metals such as iron affects the respiratory system of fish and damage caused to health of human when they eat these fishes [50].

Bacterial diseases:

By the use of untreated water for drinking a major disease caused is diarrhea. This bacterial disease and the major symptoms for it are fever, abdominal pain, nausea and headache. It can be cured by the rest, good hygiene practice and use of proper anti-biotics. [48]

The other bacterial disease is cholera major symptoms of it are watery stool nausea and vomiting. Diarrhea leads to the renal failure and dehydration, it can be cure by the proper anti- microbial treatment. [48].

Viral disease:

The main caused viral disease by contaminated water is hepatitis, it infects the liver. Symptoms of hepatitis are Jaundice, loss of appetite, fatigue, discomfort and high fever. If it persists for a long time, it may be fatal and results in death. By good hygiene practice we can save ourselves from disease. Vaccine is also available for it. [49]

WATER POLLUTION PREVENTION

1. Public awareness: Spread awareness about keeping water clean in public
2. Regular water testing: regular testing of water by physico chemical parameters to be done with following technique. In this technique Temperature, PH, DO (dissolved oxygen), BOD Biological oxygen demand, COD (Chemical oxygen demand), TDS, Turbidity, Heavy metals, Organic materials, polychlorinated biphenyls should be measure regularly before supplying water for daily usage.
3. After regular analysis of physico chemical parameters water should be treated by removing unwanted chemicals before supplying.

IV. CONCLUSION AND SUGGESTIONS

Water is very important for human to live but in current era of higher living standards water gets polluted rapidly. Due to this pollution human life on the globe is at high risk. Owing to the industrialization, Modern agricultural activities, and some unwanted human activities are the main sources of water pollution. Due these activities many unwanted substances mixed with water some of them dissolves into water. In this type of polluted water chemicals including organic and inorganic compounds, oil, polychlorinated biphenyls are found in testing physico chemical parameters. Some of them are very toxic as well as carcinogenic. By using this contaminated water in their daily life humans suffers by many diseases. And many people die every year just because of the water pollution. It is responsibility for everyone to stop the pollution to save mother nature. To stop the consumption of this water the water testing should be mandatory before suppling the water for use. If water found contaminated it should be clean by reducing the pollutants into it by different types of methods. Educate the young generation to save the Environment by this awareness is uplifted. One day we will supply the pure water to rural areas of our country by using little precautions "IF WE SAVE THE WATER, IT IS THE BEST GIFT FOR FUTURE GENERATION"

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