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Short Review Paper

Environmental Pollution and Sustainability: Its Effects on Life and its Remedies

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Abstract

Water, air and land are very important non degradable natural resources on the earth. It is a common chemical substance. Now a day's every person indirectly affected by the different types of pollutions. The purpose of this study to assess and identify the environmental pollution and its remedies, quality of water which has been used for drinking as well as for other domestic purposes for a long time. The present findings concluded that inter-relationship between sustainable economic development and environmental pollution and control environmental degradation. Environmental protection also very crucial task and maintain the Sustainability that means continues balance between present and future necessities.

Keywords: Pollution, Analysis, Remedies, Sustainability, Diseases.

Introduction

Environmental pollution is crucial dangerous problems that the world is facing today. Environmental pollution includes air, water, soil etc. Water is very essential for the survival of life because it maintains the homeostasis of the body of the living organisms. Various natural processes and human activities influence the environmental conditions of aquatic ecosystems which in turn influence the occurrence, abundance and adaptability of the biotic community. Good and hygiene potable water is the basic concern of the day as it is deteriorating gradually regarding physico–chemical and biological characteristics leading to the generation of water oriented illness. In this study, an attempt has been made to understand the various physic–chemical, microbiological, planktonic and pathogenic variables and their relationship[1].

It is fact that the pollution like air, water and land etc. is alarm to our whole environment[2]. Nitrate pollution is an important aspect of environmental problems. Due to rapid industrialization, artificial fertilizer activity in agriculture, urbanization, unsewerd sanitation and irrigation of fields by sewage effluent since independence, the possibility of nitrate pollution increases. Nitrate is considered as a second most common pollutant of ground water next to pesticides. BOD is measured as the volume of oxygen required by bacteria to metabolise organic matters under aerobic condition.

The microbial biomass and photosynthetic and heterotrophic components in a water body show a direct impact on BOD levels. The high levels of BOD are not easily reversed and an anaerobic foul in the water body is created which will not support fish and other oxygen requiring organisms. The highest values of BOD in pond water may be due to the inflow of domestic sewage, deposition of large heaps at the bank of the ponds and anthropogenic activities which result in an increase in organic matter in the water body. Increase in the BOD may also be due to nutrient loading in the water body which promote toxic algal bloom leading to destabilization of the aquatic ecosystem. Bacterial population (number of *E. coli*) is often considered as an important indicator of pollution and eutrophication in an aquatic ecosystem. Coliform bacteria have long been used as an indicator of human contamination of potable and receiving water. The great danger to health is the presence of excremental bacteria as contaminated water may cover the causative organisms of diseases[3].

The higher values of turbidity as compared to permissible limits (5 to 10 NTU) have been noted in pond (all area) and hand pump water (Goverdhan, Nagar and Kaman road) in the present investigation. Higher turbidity values indicate the probable presence of suspended and colloidal matter such as clay, silt and fibrous particles. Leaching of organic matter, domestic wastes, mass bathing (both human and animals), washing very dirty cloths faecal materials as has been seen in town Deeg may contribute turbidity to ponds water[4].

It may contaminate water through runoff during rainy season. Again, very high contamination of water resources (well and pond) due to animal and human waste and anthropogenic activities[4,5].

Water born diseases, a major problem, are carried by unhealthy environmental activities like different types of wastes contaminated water, food, without treatment sewerage etc. Water born diseases such as anaemia, diarrhoea, cardiac

problem, gastrointestinal disorder have been surveyed during pre–monsoon, monsoon and post–monsoon season in the residents of different areas.

Water Pollution

Water, a nature's gift and vital component of ecosystem and the binding element between different factors plays a role in land ecology and physiology of living organisms in the universe. Water resources comprise surface (river, pond and lake) and ground water and may cause many critical diseases. Water served to the consumers must be free from disease carrying bacteria, toxic substances and excessive amount of minerals and organic and inorganic matter[6,7] .

In recent years most of the water bodies and resources have been degraded due to population explosion, industrialization and urbanization. The main cause pollut water to agricultural runoff (fertilizers, pesticide residue), land fills and dumped garbage of domestic wastes which seep slowly through the soil and contaminate the ground water sources[7,8]. It is a common chemical substance, consisting of two atoms of hydrogen and one atom of oxygen, essential for the survival and maintenance of all known forms of life on earth. Water represents 70% of our body and indispensable for the composition and renewal of cells and transportation of most diverse substances throughout the body of organisms. Water can undoubtedly be referred to as the *sine qua* non life. When water reaches the earth through the atmosphere, it dissolves all the water soluble gases and salts from the atmosphere and the earth[9,10].

Ground water is the major source of water supply for urban and rural areas. The evaluation of ground water quantity and quality is very important since the physical and chemical characteristics of ground water determines its suitability for agricultural, industrial and domestic uses. The consequences of water born infection such as typhoid ,hepatitis, diarrhea, stomach cramps polio, cholera, etc. have been well established.

In recent years most of the water bodies and resources have been degraded due to population explosion, industrialization and urbanization. The main origin of pollution in water are discharge of agricultural runoff (fertilizers, pesticide residue), landfills, industrial effluents and dumped garbage of domestic wastes which seep slowly through the soil and contaminate the ground water sources. Pollution enters different water body in many different ways in the form of organic material (domestic sewage and industrial effluents, sewage and as a leaves. When break down this organic material by the bacteria and protozoan in the water body then blow the BOD within the permissible limit .Many types of fish and bottom–dwelling animals cannot survive when levels of D.O. drop below two parts per million. Finally kills many water living animals in large numbers which leads to disruptions in the ecosystem food chain. Ground water is the major source of water supply for urban and rural areas. The evaluation of ground water quantity and quality is very important since the physical and chemical characteristics of ground water determines water potability, importance in crop or not and utility in different industries Water born diseases such as anaemia, diarrhoea, cardiac problems, gastrointestinal disorder and skeletal problems have been found[11-13].

TDS is an important parameter which imparts a peculiar test (salty and bitter) to water affecting its potability. TDS is generally considered not as a primary pollutant but as an indication of aesthetic characteristics of drinking water and the presence of a broad array of chemical contaminants. Some dissolved solids come from organic sources such as leaves, silt, plankton, industrial waste water and sewage. Other sources include runoff from urban areas, road resorts on streets during the winter and agriculture (fertilizers and pesticides used in lawns and farms).Dissolved solids also come from inorganic materials from rocks and air that may contain calcium bicarbonate, nitrogen, iron, phosphorus, sulfur, and other minerals. Many of these materials form salts that contain both a metal and a nonmetal. Salts usually dissolve in water forming ions. Hardness is an important criterion for determining the suitability of water for domestic, drinking and many industrial purposes. Commonly the total hardness is reported as an equivalent concentration of calcium carbonate ($CaCo_3$). Both Ca^{+2} and mg^{+2} ions are essential for the development of flora and fauna. Originally hardness was regarded as a measure of the capacity of water to precipitate soap by calcium and magnesium ions present in the water. Natural source hardness principally is due to lime stones which are dissolved in percolating rain water. Industrial sources include discharges from operating and abandoned mines. Hardness in water may be due to the natural accumulation of salts generated by the contact of water with soil and geological formation[14].

Extremely low D.O. in the pond water has been recorded which may be attributed to the inflow of domestic sewage and waste water and deposition of organic matter and decay vegetation into the pond. These probably enhance the microbiological activity to clear the organic waste which consume more oxygen leading to decrease in dissolved oxygen in the present study. The salinity reflects the salts, TDS and chloride contents in water and soil. Irrigating with water of higher salinity will result in loss of yield and decrease in quality of crop. Salt affected plants may exhibit stunted growth and have darkened green leaf colour. Salinity acts as a limiting factor in the distribution of living organisms and its variation is caused by dilution and likely to influence the fauna in the ecosystem[15].

Harmful effects of polluted Environment on whole Ecosystem

Very dangerous effects found in animals and human like headaches and dizziness, irritation of eyes neurobehavioral disorders, asthma exacerbations, nose, mouth and throat, reduced lung functioning, cardiovascular problems, reduced energy levels, respiratory symptoms, respiratory disease premature death, asthma etc[16,17].

"When we looked closely at the ventricles, we could see that the white matter that normally surrounds them hadn't fully developed. It appears that inflammation had damaged those brain cells and prevented that region of the brain from developing, and the ventricles simply expanded to fill the space. Our findings add to the growing body of evidence that air pollution may play a role in autism, as well as in other neuro developmental disorders." It is concluded that in recent years most of the water bodies and resources have been degraded due to population explosion, industrialization and urbanization. Agricultural runoff (fertilizers, pesticide residue), land fills and dumped garbage of domestic wastes which seep slowly through the soil and contaminate the ground water sources[18]. Turbidity has no health effects. Turbidity may indicate the presence of disease causing organisms. These organisms include bacteria, viruses and parasite that can cause symptoms such as nausea, cramps, diarrhoea and associated headaches. High TDS indicates hard water, which causes scale build up in pipes and valves inhibiting performance. Water with high dissolved solids is of inferior potability and may induce an unfavorable physiological response in the body of consumer[19].

The hardness may be advantageous in certain conditions. It prevents the corrosion in the pipes by forming a thin layer of scale and reduces the entry of heavy metals from the pipe to water[1]. Hard waters are unsuitable for laundry purposes as well as domestic use. They also cause encrustations in water supply pipes, steam boilers etc. Waters of almost all study points are very hard in the present study and may cause problems in people of town Deeg (Bharatpur) such as gastrointestinal disorder. The decreased level of dissolved oxygen along with the higher B.O.D. and C.O.D. in the pond water is evident in the present study. It indicates high organic pollution in the pond water due to the discharge of city domestic wastes which may be responsible for the decline of D.O.

Recommendations

i. Surface or rainwater should be used instead of ground water in the affected areas after proper treatment. ii. These include diverting sewage out-falls, prevention of solid waste disposal, bathing of animals and human defecation, washing of vehicles, cloths etc. in and on the banks of pond. iii. To keep the dissolved oxygen high floating fountains should be applied in different positions. They pump bottom deoxygenated water and spray it over the ponds and develop toxic bottom. iv. Prevention of solid waste disposal in the vicinity of hand pumps and wells. v. Municipalities that maintain a public water supply will typically monitor and treat for faecal coliforms[18]. vi. Treatment technologies available in the market for efficient reduction of nitrate in drinking water eg. electro–dialysis, reverse osmosis, ion exchange must be used. vii. Biological and chemical remediation and mineral treatment must be employed. viii. Water should be monitored by the rolling boil then cooling and alum or bleaching treatment before use to minimize the concentration of TDS. ix. Disinfection of community well, proper sewage drainage systems, periodical quality monitoring of drinking water sources, simple and economical water treatment like filtration, boiling, reverse osmosis etc. would prove beneficial to avoid water born diseases in the study area.

Conclusion

Water born diseases such as anaemia, diarrhoea, cardiac problem, gastrointestinal disorder have been surveyed during pre–monsoon, monsoon and post–monsoon season in the residents of all age group and sex with the help of questionnaire in town Deeg (Bharatpur) Rajasthan in the present investigation. Due to the physico–chemical parameters, which have been revealed beyond the acceptable limits, the water of town Deeg is not fit for potable and other purposes if used without any treatment[20]. Management and conservation measures must be implemented to improve the water quality. The further study such as the estimation of trace elements (As, Zn, Iron) and pesticides will definitely be fruitful in improving the potability of water in town Deeg (Bharatpur). From the present study it is evident that ground water quality is gradually getting deteriorated and it may deteriorate further with time. The water quality of well and hand pump of all areas are polluted and unfit for human consumption for any use. People may suffer through disease on drinking water with higher concentration of toxic chemicals. They may have physiological effects as on kidney, digestive system, circulatory system, nervous system etc. various other organs and various systems of the body.

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