ISSN 2020-9021
ICRRD HIGH INDEX RESEARCH JOURNAL
(An Initiative of International Center for Research and Resources Development)
Reg. No: Printed: 1347468-T, Online: 201901038138, www.icrrd.com

Water pollution and its affect in human health Context of Pakistan.

IJAZ BATOOL RAI.
BS[hons] Botany
Govt. college women university
Faisalabad, Pakistan

Received: June 06, 2020	**Accepted:** June 20, 2020	**Published:** July 27, 2020
Volume: 7	**Issue:** 3	**Year:** 2020

Abstract

Water pollution was defined by Olanairan "water is defined as the presence of excessive amount of hazard in the water in such a way that it is no longer suitable for drinking, bathing, cooking or other uses". According to Webster.com 2010, "pollution is the introduction of contaminants to the environment. Water is a source of life until it is not polluted, this article will show the effects of water pollution, sources, types and prevention or cure of water pollution. Anthropogenic activities are the main reason of water pollution and it has very severe impacts on the health of plants, animals and human being. Most of the water is polluted and it should be treated to remove pollutants from it before use.

In Dhaka, river pollution has become a major problem, the study was conducted to collect the information about pollution in "Turag river" so it was proved that the quality of water is hazardous for health. In the water of river, high concentrations of TDS, COD, BOD and turbidity were found, that was causing several diseases: Skin diseases, Diarrhea, Dysentery, Respiratory issues, Anemia, Childbirth complications, Fever, Cholera, Dengue.

Water quality of rivers is very important because it is used for almost every purpose like, drinking, washing, irrigation, tourism, infrastructure, hydrolytic power-plants etc. For the determination of the location of pollutants in the "Timis-Bega", analysis has been done. For these analysis WQI [water quality index] was used. We cannot ignore the importance of water for the regulation of life, i.e. home uses, cattle crops and other industries. To maintain the life on earth it is very important to do not contaminate the water.

Categories of water pollution:

- **Groundwater:**
  Rain falls make the groundwater when it seeps in the earth. It is most natural groundwater source. American are using the groundwater about 40%, in some rural areas it is the way of freshwater for them. Pesticides and fertilizers make the ground water polluted. Removal of contaminants is very tough from water.

- **Surface water:**
  Water in the lakes, rivers and ocean is called surface water and it is covering about 70% of the earth. American are using about 60% freshwater for their daily needs. According to survey from U.S. environmental protection agency, about half of the rivers and greater than one-third of lakes are polluted and are not suitable for drinking, fishing and swimming. Freshwater sources are mainly contaminated by nitrates and phosphates.

- **Ocean water:**

About 80% of pollution of marine is because of land. Nutrients, chemicals and other contaminants enter in the ocean from farms, factories by rivers and streams. Sometimes the leakage of oils from ships also contaminate the water. Absorption of air carbon by water also making it polluted.

- **Point sources:**

  When the source of contamination is one, it is known as point source pollution. Examples are;

  - Effluents legal and illegal discharge
  - Oil refineries
  - Leakage of septic system
  - Illegal dumping

- **Non-point sources:**

  Contamination of water by diffuse sources is called non-point pollution. Such as;

  - Water runoff by agriculture
  - Debris

  In U.S. it is major cause of water pollution.

- **Transboundary:**

  By the spilling of contaminated water from one country to others leads to the transboundary pollution. It can originate by;

  - Oil leakage
  - Industries
  - Agriculture
  - Municipal discharge.

Types of pollutants:

Organic water pollutants: containing herbicides, insecticides and many others chemicals, bacteria from livestock and sewage, waste from food processing etc.

Inorganic water pollutants: may originates from drainage from acid mines, heavy metals, slash, water logging, fertilizers, burning activities etc.

Water pollution sources:

- Sewage leakages

- High population density
- Oil spillage
- Menace of Nipa palm and water hyacinth
- Dumped industrial waste in water
- Through drilling activities groundwater pollution
- Floods
- Building lavatories and visionaries over running water
- Radioisotopes
- Heavy metals
- Combustion
- Toxic waste disposal at sea
- Mineral processing plants
- Eroded sediments
- Deforestation
- Mining
- Littering
- Pesticides
- Herbicides
- Fertilizers
- Falling septic system
- Household chemicals
- Animal waste.

General reason of the introduction of water pollution is humans. Main causes of water pollution are;

- ✓ over population
- ✓ agriculture practices and
- ✓ industries [Eguabori 1998]. In urban areas water pollution has become worse. In agnatic habitats, industrial, domestic and agriculture waste water is major reason of contamination. Mostly fresh water is contaminated by sewage, it reduces the amount of oxygen dissolved in water because of the stimulation of decomposers by organic matter which is responsible for the breaking of suspended particles. Suffocation causing the death of flora and fauna of rivers[TUDGE,1991]. Removal of hot water is another cause of water pollution, it lowers the metabolic rates of organisms. Detergents and fertilizers are very hazardous to river species.

Water pollution and human health:

Water pollution and problems related to health are associated to each other. Pathogens are micro-organisms that are causing disease in human beings. Some pathogens are specific to their area while others are worldwide in distribution. So many diseases are pandemic. In developed and under developing countries, excessive weathering, heavy rainfall and floods are creating severe diseases. Food and vegetables are grown in contaminated water are supplied to 10% of the population. Different diseases like cancer, diarrheal diseases,

neurological disorder and heart diseases are mainly because of water pollution. Death rate is higher in rural areas as compared to cities because they don't have facilities of water filtration. During pregnancy, effects of contaminated water are higher. Food chain is effected by pollutants.

- **Bacterial diseases:**

Contamination of water by impurities is the reason of diarrhea. Major symptoms are;

- nausea,
- pain and headache.

Cholera is also because of use of un-cleaned water containing "Vibrio Cholerae".

Shigellosis affects the human digestive track and intestinal lining caused by the bacteria "Shigella". Its symptoms are;

- diarrhea containing blood or water in it,
- cramps in abdomen,
- vomiting and
- nausea.

These diseases can be controlled by using antibiotics and good hygiene. Intestinal track can be affected by "Salmonellosis". It causes inflammation and sometimes death of person.

- **Viral disease:**

Disease caused by VIRUS is hepatitis due to contaminants in water. It is infection of liver. Its symptoms are;

- Jaundice
- Appetite loss
- Fatigue
- Discomfort
- High fever

It may cause the death if persists for log time. Vaccination is available for hepatitis.

Disease that is caused by the eggs of Culex mosquito laid in the water consisted of symptoms like;

- headache,
- high fever,
- stiffness of muscles,
- convulsion,
- coma and
- paralysis.

The symptoms of poliomyelitis are;

- Sore throat,
- nausea,
- fever,
- constipation are the symptoms of poliomyelitis.
- Vomiting,
- headache and
- fever are the symptoms of gastroenteritis.

- **Parasitic diseases:**

Cryptosporidium parvum is a parasite that cause disease “Cryptosporidiosis”. Symptoms;

- Diarrhea
- Loose bowls
- Cramps in stomach
- Upset stomach

Effects of water pollution on plants:

- **Acid deposition effects:**
  Most of the gases from domestic and industrial combustion releases in the atmosphere and fall on the ground with rain water. This cause acidification by reducing the pH. In most of the countries water bodies [lakes, rivers and pond] are becoming acidic because of the deposition of sulphates, nitrates and chloride.

- **Deficiency of nutrients in aquatic ecosystem:**
  Nutrient cycle is affected by the reduction of organic matter decomposition because of the decline in the population of microorganism [bacteria and fungi]. These species reduces the pH of water bodies.

- **Effects of deposition of organic matter:**

  Deposition of dead materials of plants and animals takes place in the sewage discharges and are the source of increase the decomposers. Planktonic growth increased by the increase of organic matter in the water which reduces the light penetration. It reduces the DO [dissolved oxygen].

- **Effects of deposition of detergent:**
  Detergents used by homes pass in to water, effect badly to plants. Detergents carry phosphate which enters in to the plants by their roots and cause growth retardation.

- **Agriculture used chemical affects:**
  In agriculture; pesticides, fertilizers, insecticides etc. are used in wide range to enhance the crop yield. These chemicals washed by rain water and enter in the soil and change the pH of underground and surface water. Most commonly they reduce the photosynthesis.

- **Effects of industrial waste:**
  Many organic and inorganic matters are present in effluents and their flouting on water surface avoid the light penetration, reduction in pH, and cause the toxicity of water. [Singh, M. R., & Gupta, A. (2017). Water pollution-sources, effects and control.]

Determination of parameters of water quality:

- **DO [dissolved oxygen]:**
  For this purpose; samples with diluted water was taken in bottle and reading was taken by placing the multi-meter in the bottle.

Parameter	Standard
DO	6mg/l
pH	6.5 to 8.5
Colour	15 ptcu
Turbidity	10 NTU
BOD	0.2 mg/l
Hardness	200 t0 500 mg/l
TDS	1000 mg/l
Chloride	0.2 mg/l
Carbon dioxide	-
COD	4 mg/l

TABLE: Water quality parameters limitation

- pH: pH meter is placed in the bottle containing water in it for few minutes. pH meter shows the reading.
- Colour: colour test is taken by the spectrophotometer. Before the test it is neutralized by distilled water. Reading is taken by placing the sample in spectrophotometer.
- Turbidity: To get the reading of turbidity, the sample is taken in small tube of turbidity meter.
- BOD: to determine the biochemical oxygen demand, the sample is diluted with water and takin the readings by multi-meter, for 5-days sample is placed in refrigerator at 200℃. Final results were taken by multi-meter.
- Hardness: sample is taken about to 50 ml in a beaker and diluted with distilled water to determine the hardness, for the titration starch is added in this process. When purple colour shown readings are taken.

- Total dissolved solids: beaker is used to take water as sample and then multi-meter probe is placed inside beaker, TDS of water can be seen on the screen of multi-meter.
- Chloride: for this purpose 2 sample cells are used. One is filled with sample and 2nd with de-ionized water then about 05ml Ferric ion is added to these samples and placed them for at-least 2 minutes. Results can be taken by spectrophotometer.

Water crises and role of agriculture:

In developed and under-development countries water pollution is increasing day by day and it has become a global problem effecting the health of billions of people and environmental health too. In many countries of the world regardless of the efforts to clean the water, water pollution is continuously increasing. Agenda of 2030 is maintain the quality of water has been exposed. Basic sources of water pollution are human activities, industries and agriculture. About 80% untreated discharged water is enter in the water bodies. Industries are releasing tonnes of toxic sludge and other wastes in the water bodies each year. Agriculture plays an important role in the water pollution, it releases about 70% water abstraction worldwide. Saline water, agro-chemicals and organic substances are releases by farm which leads water pollution.

In highly developed countries agro-pollution is overtaken. Major contaminant of ground water is nitrate that released from agriculture [WWAP,2013].

- If we talk about European Union, 30% water is polluted by agriculture [WWAP,2015].
- Agriculture is mainly polluting the water in United State of America [US EPA,2016].
- China large amount of ground water is effected by agriculture especially by nitrogen [FAO,2013].

Industrial wastewater and municipal is a major problem of pollution in developing countries. Throughout the world pesticides and fertilizers are used to increase the yield of crops, after leaching it creates water pollution. As compare to crop production growth of live stock is faster, so manure is a very serious participant of water pollution.

Control of water pollution:

- To improve the quality of water don't release the oils, fats or greases directly in the water and discard them to prevent the contamination of water.
- Avoid the dispose of home used chemicals and cleaning agent in the toilet because they make the water hazardous to use when they enter in it.
- Don't flush the medicines, flush pills and powder.
- Dispose the Tissues, wrappers, dust cloths and other materials instead of flushing them in the toilet.

- Reduce the use of plastic because it causes the difficulties in the survival of organisms leaving under water.
- Re-use the products as possible instead of wasting them.
- Always choose the recycle-able products and avoid things that are made up of plastic.
- Don't throw the garbage in the water because it contaminates the whole water resource and it is very harmful for water supply.
- Don't use the excessive water to wash the cloths, dishes and for bathing.
- Reduce the use of soaps, detergents and chemicals as it is possible.
- Use the rain water for gardening purpose.
- Don't use pesticides etc. in your garden because when they enter in the water cycle they contaminate it.
- Conserve the soil because when we apply the fertilizers it spread on the topsoil and after leaching contaminate the underground water.
- Air pollution has impacts on water so maintain your vehicles.
- Immersion of ashes to river cause the water pollution so don't do that.

REFERENCES

Jafor Iqbal, China large amount of ground water is effected by agriculture especially by nitrogen [FAO,2013

Mizan Rahman, If we talk about European Union, 30% water is polluted by agriculture WWAP,2015

Singh, M. R., & Gupta, A. (2017). Water pollution-sources, effects and control.

Somotro Bormon, In highly developed countries agro-pollution is overtaken. Major contaminant of ground water is nitrate that released from agriculture [WWAP,2013].

Afsar Motin, (2019). Effects of Pakistan's energy crisis on farm households. Utilities Policy, 59, 100930.