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EFFECT OF TOXIC POLLUTANTS ON HUMANS

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Abstract:-Humans have established communities and flourished around sources of clean, drinkable water since the beginning of time. It's vital to our survival. Water sustains life. Water is needed for food and agriculture development. It is needed for energy, human settlement, industry and ecosystems. In all these areas, the right amount and type of water required is essential. Many sea water animals will not survive for long in fresh water, just as many fresh water animals will not survive in the sea. Humans cannot drink sea water and frankly, because of the high salt content of seawater, we cannot use it in construction, because of the corrosive effect of salt. This means, if we alter the chemical composition of water in anyway, we risk having negative repercussions. This is what makes water pollution so real and critical. We can survive several days without food but not without water? It's heartbreaking to know that millions of people worldwide do not have access to this most basic need, and are dying of thirst and water borne diseases. Freshwater sources around the world are threatened by water pollution. Not only are we managing our resources poorly through wastage, we are also thoughtlessly dirtying it.

Keywords:Toxic, Water, Pollutants, Humans.

WATER POLLUTION

Any change or modification in the physical, chemical and biological properties of water that has a detrimental consequence on living things is water pollution.

SOURCES OF WATER POLLUTION:

Our water bodies are not protected adequately. It's just a near impossible task, because of the way water is distributed on the earth's surface. Rain water that runoff may carry all the toxic stuff on the ground surface, trash and disease-carrying organisms along the way to wherever it ends up. If the water gets infiltrated, it carries all the dissolved toxins on the surface down into the water table. And think about it, the rainwater itself may be contaminated in the atmosphere even before it falls to the ground. These toxic stuff on the ground surface and in the air are all results of human action.

Pollutants may come from specific sources such as industry, dams, mines, animal farms, feedlots and waste water treatment plants. This is called Point Source pollution, and it is usually easy to deal with those. The other type, called Diffuse or Non-Point sources, include pollutants from storm water, the atmosphere, septic, landfills and forestry is bit more difficult to control, because of its nature. Pollutants may be natural or human caused, and may include contaminants that can affect water quality such as nutrients, sediments, organochlorines, heavy metals, oil and hydrocarbons, chemical constituents and pathogens.

1. Eutrophication

This is when a water body has a lot of pollutants containing nutrients thrown into it in a way that increases algae and plant growth in the water. This hurts animal life in that water because soon, the massive growth of algae consumes all the oxygen in the water, starving other animal life. Eutrophication is caused by increased application of fertilizers, waste from animal and households, as well as land clearing for agricultural purposes. Eutrophication is common in estuaries, but with recent increase in global temperatures, there is a threat that the effect will be felt in the oceans to which the estuaries are connected.

2. Microbial Pollution

This results from poor treatment of human sewage as well as poor treatment of sewage from large or industrial farms, discharges of factories households, hospitals and dead bodies of humans and animals. The pathogens in microbial pollution are a major health hazard, especially in areas with poor drinking water treatment.

3. Solid waste

A poor waste disposal activity is probably the culprit here. Visit beaches and water recreational joints to witness all sorts of rubbish piles washed ashore by the water. This is not only a horrible sight, but also cause harm to humans and animals as well. The trans-boundary effect of this makes it worse, as the rubbish can be transported thousands of miles from one place to the other. In addition to locally produced solid waste, an estimated 700 000 tones of solid waste is generated annually by the 35 million tourists who visit the Caribbean, many on cruise liners¹.

4. Chemical Pollution

Agricultural run-off, municipal waste discharges, mining and industrial discharges, landfills and atmospheric transport add up to a massive occurrence of chemicals being discharged into water bodies. Persistent organic pollutants such as furans and dioxins, as well as heavy metals like mercury and cadmium can be transported over long distances when dissolved in water. Large scale pesticides applied to sugarcane on plantations in Central America have had negative effects on the health of people there and is believed to have resulted in reduced fish stocks in the Nicoya Gulf of Costa Rica.

Some Toxic Chemicals That Have Been Found in Water

Fluoride

While this compound has many positive traits, such as the ability to clean our teeth, it can also be quite toxic. It is used in the extremely toxic nerve agent sarin gas.

Chlorine

Chlorine is a chemical element that is essential to human life. However, in anything other than trace amounts, it becomes a toxic gas that irritates the respiratory system.

Mercury

Exposure to mercury can cause tremors, psychotic reactions, and suicidal tendencies.

Lead

This poisonous metal can damage the blood, brain, and disrupt nervous system communications⁴

PCB's:

A class of organic compounds that cause skin, blood, and urine problems in humans.

Arsenic:

An element that has been used for centuries as a deadly poison.

MtBE

MtBE is a volatile, flammable, and colorless liquid that is used as an additive in gasoline.

DCPA

DCPA is an herbicide used on strawberries, melons, and cucumbers.

Perchlorate

This is used as an oxidizer in rocket fuel and explosives.

Dioxin:

An organic compound which is known to increase the likelihood of cancer.

Hexachlorobenzene(HCB):

Commonly used as a pesticide, HCB can cause cancer and disrupt the endocrine system and interfere with enzyme activity.

DDT:

A deadly chemical used as an insecticide. It has been linked to diabetes and cancer.

Nitrates:

Nitrates are especially dangerous to babies that drink formula milk. It restricts the amount of oxygen in the brain and cause the "The Blue Baby" Syndrome.

Chemicals in water drugs in water from medical waste that seeps into the water.

5. Oil Pollution

Oil drilling, refining and transportation have long been a major issue especially with marine pollution. We depend so much on oil that it is hard to put in place very tough controls to prevent it. Oil spills from tankers and vessels cause a lot of short and long term harm to water life. Nearly 5000 oil spills in the Niger River delta were reported between 1976 and 1996, releasing nearly 375,000 tons of oil in total. This has resulted in groundwater contamination and a loss of biodiversity in the vicinity of oil installations².

6. Acid Rain

It is caused due to air pollution especially by burning of fossil fuel.

7. Urbanization

Almost everything that is byproduct of our civilization is polluting our drinking water.

EFFECTS OF WATER POLLUTION

1. Human Health

(a) Infectious diseases can be spread through contaminated water. Some of these water-borne diseases are Typhoid, Cholera, Paratyphoid Fever, Dysentery, Jaundice, Amoebiasis and Malaria.

We all drink water that comes from a source: this may be a lake or local river. In countries that have poor screening and purification practices, people often get water-borne disease outbreaks such as cholera and tuberculosis. Every year, there are an estimated 3–5 million cholera cases and 100,000–120,000 deaths due to cholera. (WHO estimates that only 5–10% of cases are officially reported) In developed countries, even where there are better purification methods, people still suffer from the health effects of water pollution. Toxins emitted by algae growth for instance: this can cause stomach aches and rashes.

(b) Here are some of the negative health defects caused by excess chemicals in the water:

• Toxic chemicals in water can cause brain damage. In one study, children who were exposed to high levels of fluoride

had lower than normal IQ's.

•Alzheimer's disease and dementia may be caused by lethal amounts of fluoride.

According to New Jersey's Department of Health, male children who lived in areas with fluoridated water experienced two to seven times more cases of bone cancer than other male children.

•Toxic chemicals in water can cause birth defects and prenatal deaths.

•Excess chemicals in the water have also been linked to problems with the immune system. Excess nitrogen in drinking water also pose serious risks to infants.

EPA's 2010 National Lakes Assessment found that almost 20 percent of the nation's lakes have high levels of nitrogen and phosphorus pollution. The report also showed that poor lake conditions related to nitrogen or phosphorus pollution doubled the likelihood of poor ecosystem health¹.

2. Ecosystems

Nutrient pollution from upstream (creeks and streams) often flow downhill and even travel miles into other larger water bodies. The effect is that, it breeds algae growth and causes the growth of many more water organism. This algae attack affects fish and other aquatic animals by absorbing and reducing their oxygen supply. Algae growth also clogs fish gills. Naturally, the order of ecosystems in that water is affected negatively, as the destruction or introduction of any foreign organism alter the entire food chain in there.

3. Death of animals

Animals, including water animals die when water is poisoned for various reasons. Other animals are stressed and their populations are endangered. In a classic case of marine pollution in recent time, 16000 miles of a US coastline was affected by an oil spill. That water pollution caused a lot of damage and deaths of many animals. Over 8,000 animals (birds, turtles, mammals) were reported dead just 6 months after the spill, including many that are already on the endangered species list. Immediate impact on the wildlife includes oil-coated birds and sea turtles, mammal ingestion of oil, and dead or dying deep sea coral². Animals are also affected by solid waste thrown into water bodies, as they harm them in many ways.

4. Economic cost

From the above it is evident that there is some real financial implications that will result from water pollution. It can cost a lot more to purify drinking water that takes its source from nutrient polluted water bodies. Fishing stock is affected negatively when there is a depletion of oxygen. Consumers are also weary of fish from these sources and tend to stay away from them, costing fisheries to lose revenue. In places where there are water activities or sports, lots of money is spent to clean up the water from algae blooms and the like. The U.S. tourism industry loses close to \$1 billion each year, mostly from losses in fishing and recreational activities because of nutrient-polluted water bodies.

Prevention of water pollution

It is easy to be overwhelmed by the problem of water pollution and think that individuals cannot make a difference. If each person in a township can be responsible in the way they deal with waste, sewage and the things that cause pollution, there would be a remarkable improvement to the problem. Preventing water pollution can be a two way approach:

Individuals

1. Know where all your drains and sewage lead to and make an effort not to throw waste water into drains. If there are organic matter in your waste or sewage, think of ways to compost them, or follow laid down instructions given by your local council on how to dispose of organic waste.
2. Ensure that you comply with the waste disposal arrangements made by your council.
3. Reduce waste creation. We all have a rather bad culture of want and waste. It is possible for each family or individual to reduce consumption and waste by half. The less we consume of everything, the less would be produced by manufacturing industries and farms. Ultimately resulting in less pollution.
4. Look out for, and be mindful of where to dispose of hazardous chemicals and medicines. Your local council or police station can assist with information on how to dispose of chemicals and hazardous waste.

5. Planting trees and use of recyclable products, proper garbage disposal to minimize pollutions and switching to eco-friendly lifestyle.

Policy

Government policies and laws can make a world of difference. Here is what can be done:

1. Governments can invest in research, and assist with the provision of logistics for industries, farms and businesses to dispose of waste. Planning with these industries and farms creates an awareness of the consequences of their actions and establishes a commitment to reducing the negative impact of nutrient pollution.

2. Education on the dangers of water pollution is extremely important, as it helps people to apply the right attitudes when dealing with the environment. Education activities that get people informed and empowered to help protect water should be encouraged and invested in.

3. Laws must be enforced, with very hefty fines and actions for industries that do not comply with water pollution prevention laws. If industries know that they are being monitored and checked regularly, they will usually ensure best practices of waste and chemical dumping at all cost.

Help increase awareness by educating our children and increasing awareness within our community. There's a long way to go, but as we mature as a society and as our technologies progress, we can improve our methods of protecting our water supply. Right now, everyone just needs to do their share, from their end.

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