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Water Pollution and Its Control State of Art : A Review

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Abstract : Water pollution is the contamination of water bodies(e.g. lakes, rivers, oceans, aquifers and groun dwater). This form of environmental degradation occurs when pollutants are directly or indirectly discharged into water bodies without adequate treatment to remove harmful compounds. Human activities including industrialization and agricultural practices contributed immensely in no small measure to the degradation and pollution of the environment. Water is essential for the existence of all life forms. In addition to household uses, water is vital for agriculture, industry, fishery and tourism etc. Increasing population, urbanisation and industrialisation has led to the decreased availability of water.

Keywords : lakes, rivers, oceans, aquifers and groundwater

Introduction

Water is that chemical substance which is essential for every living organism to survive on this planet. Water is needed by every cell of the organism's body to perform normal function. Water covers 71% of the Earth's surface, mostly in oceans and other large water bodies, with 1.6% of water below ground in aquifers and 0.001% in the air as vapor, clouds and precipitation . Water moves continually through a cycle of evaporation or transpiration (evapotranspiration), precipitation, and runoff, usually reaching the sea. Winds carry water vapor over land at the same rate as runoff into the sea. Over land, evaporation and transpiration contribute to the precipitation over land. Clean, fresh drinking water is essential to human and other life.

Currently pollution in india

Pollution index	**75.36**
Pollution exp scale	**132.23**

Table no. 1

Current Water Quality Data for the Month of July 2017*

Raw Water Quality	
Non-Carbonate Hardness, ppm	86
Total Hardness, ppm	380
Total Hardness, grains per gallon	22.17
Ph	7.38
Treated Water Quality	
Non-Carbonate Hardness, ppm	99
Total Hardness, ppm	160
Total Hardness, grains per gallon	9.34
Ph	9.54
Chlorine residual, ppm	2.58
Iron content, ppm	0.19
Fluoride content, ppm	.67
Turbidity, NTU's	0.09
Bacterial Samples	Samples taken = 60 Confirmed positive samples = 0

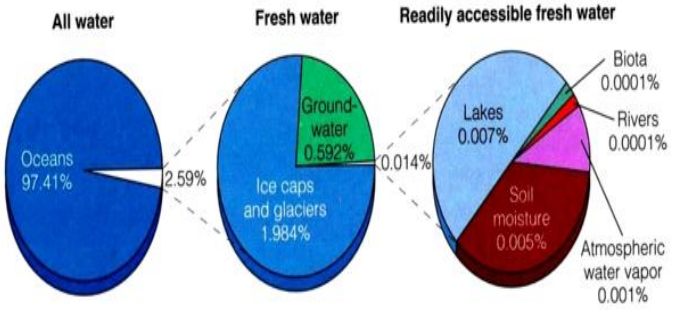
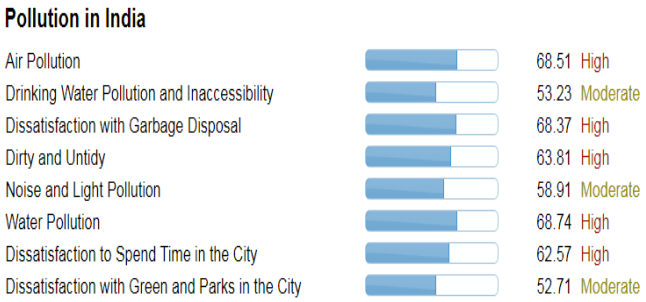


Figure 1: Water resources in world



Source Of Water Pollution

Domestic wastage- Sewage (or **domestic wastewater** or **municipal wastewater**) is a type of wastewater that is produced from a community of people. It is characterized by volume or rate of flow, physical condition, chemical and toxic constituents, and its bacteriologic status (which organisms it contains and in what quantities). It consists mostly of greywater (from sinks, tubs, showers, dishwashers, and clothes washers), blackwater(the water used to flush toilets, combined with the human waste that it flushes away); soaps and detergents; and toilet paper (less so in regions where bidets are widely used instead of paper).

Industrial wastage -Wastes from industry serve as major sources for all water pollutants. Many major industries contribute significantly to water pollution, but some of the

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important are the (i)manufacturing (ii) power-generating (iii) miningand construction, and (iv) food processing industries (Mc Kinney and Schoch 2003).Manufacturing industries like chemical, oilrefining, steel etc. contribute many of the mosthighly toxic pollutants,

Agrictural wastage- These are generated by the cultivation of crops and animals. Globally,agriculture is theleading source of sediment pollution which includes plowing and other activities that remove plant cover and disturb the soil. Agriculture is also a major contributor of organic chemicals, especially pesticides (Mc Kinney and Schoch 2003). Pesticides are widely used in modern agriculture in most countries throughout the world and in a large range of environments. But environmental monitoring increasingly indicates that trace amounts of pesticides are present in surface and underground water bodies, far from the sites of pesticide application (Voltz et al. 2007). The use of nitrogen fertilizers can be a problem in areas where agriculture is becoming increasingly intensified. These fertilizers increase the concentration of nitrates in groundwater, leading to high nitrate levels in underground drinking water sources, which can cause methemoglobinemia, the life threatening "blue baby" syndrome, in very young children, which is a significant problem in parts of rural Eastern Europe (Yasso et al. 2001). Some pesticides are applied directly on soil to kill pests in the soil or on the ground. This practice can create seepage of pesticides to groundwater or runoff to surface waters.

Pollution Of Water Treatement

Wastewater treatment plants may be wastewater, agricultural wastewater or leachate.

Sewage Treatment Plants

Sewage treatment plant - A typical municipal sewage treatment plant in an industrialized country may include primary treatment to remove solid material, secondary treatment to digest dissolved and suspended organic material as well as the nutrients nitrogen and phosphorus, and – sometimes but not always – disinfection to kill pathogenic bacteria. The sewage sludge that is produced in sewage treatment plants undergoes sludge treatment. Larger municipalities often include factories discharging industrial wastewater into the municipal sewer system. The term "sewage treatment plant" is now often replaced with the term "wastewater treatment plant".

Tertiary treatment-

Sewage treatment § Tertiary treatment--Tertiary treatment is a term applied to polishing methods used following a traditional sewage treatment sequence. Tertiary treatment is being increasingly applied in industrialized countries and most common technologies are micro filtration or synthetic membranes. After membrane filtration, the treated wastewater is nearly indistinguishable from waters of natural origin of drinking quality (without its minerals). Nitrates can be removed from wastewater by natural processes in wetlands but also via microbial denitrification. Ozone wastewater treatment is also growing in popularity, and requires the use of an ozone generator, which decontaminates the water as ozone bubbles percolate through the tank, but this treatment is energy intensive. The latest, and very promising treatment technology is the use aerobic granulation

Industrial wastewater treatment plants

Two of the main processes of industrial water treatment are boiler water treatment and cooling water treatment. A lack of proper water treatment can lead to the reaction of solids and bacteria within pipe work and boiler housing. Steam boilers can suffer from scale or corrosion when left untreated. Scale deposits can lead to weak and dangerous machinery, while additional fuel is required to heat the same level of water because of the rise in thermal resistance. Poor quality dirty water can become a breeding ground for bacteria such as Legionella causing a risk to public health.

With the proper treatment, a significant proportion of industrial on-site wastewater might be reusable. This can save money in three ways: lower charges for lower water consumption, lower charges for the smaller volume of effluent water discharged and lower energy costs due to the recovery of heat in recycled wastewater.

Corrosion in low pressure boilers can be caused by dissolved oxygen, acidity and excessive alkalinity. Water treatment therefore should remove the dissolved oxygen and maintain the boiler water with the appropriate pH and alkalinity levels. Without effective water treatment, a cooling water system can suffer from scale formation, corrosion and fouling and may become a breeding ground for harmful bacteria. This reduces efficiency, shortens plant life and makes operations unreliable and unsafe.[3]

Domestic water treatment –Water supplied to domestic properties may be further treated before use, often using an in-line treatment process. Such treatments can include water softening or ion exchange. Many proprietary systems also claim to remove residual disinfectants and heavy metal ions.

Effect Of Water Pollution

Water pollution is the contamination of water in water bodies such as rivers, oceans, lakes and swamps. This means that one or more substances have built up in water to the extent of causing problems to people, animal.

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1. **Industrial process:** When manufacturers and factories are simply allowed to pour toxic chemicals into water bodies before treatment, the water becomes polluted. The oxygen levels in the water also decreases. The toxic chemicals include: lead, sulphiric acid, mercury and used oil.
2. **Inorganic Industrial waste:** Inorganic wastes such as acids, mercury, lead and heavy metals can destroy the normal body processes. The presence of these toxic and corrosive substances in water is dangerous to living things. Factories and other industries dump waste products into water at an alarming rate.
3. **Agricultural fertilizers:** By a process known as leaching, agricultural chemicals such as fertilizers and pesticides can wash into rivers and lakes, poisoning them.
4. **Untreated sewage from households:** Dye, lotion, soap, hair oil, shampoo, powder, deodorant, moisturizer and many other such products also contribute in water pollution. These products go to the sewage without any treatment. Untreated sewage from households can contaminate different water bodies in the process. When sewage pipes break, there is a chance that the wastes will contaminate drinking water. Sometimes, poorly treated sewage is released into water bodies. Domestic cleaning products can be very dangerous pollutants.
5. **Garbage:** Plastics are non-biodegradable. Mass plastics clog water bodies and contaminate water.
6. **Urbanization:** Urbanization is a key factor in increasing the amounts of water pollution.
7. **Dumping solid waste:** Humans often carelessly dump their trash in the sea or near rivers.
8. **Oil spills:** Accidental oil spills have a devastating effect on seas.
9. **Dissolved gases:** Polluting gases in the air can dissolve into salt and fresh water and pollute it.
10. **Boat fuels:** Fossil fuels used in the shipping industry are one of the largest causes of both air and water pollution.
11. **Heated water from power plants:** Some power plants release the heated water into water bodies. This reduces the oxygen content in water. Power plants normally use heated water to cool their machines.

Control Of Water Pollution

1. **Stop using harmful chemicals at home:** Opt for environmentally friendly household cleaners.
2. **Prevent industrial waste reaching water:** Dispose of industrial waste by burying or neutralizing it instead.
3. **Sewage treatment:** Household water should be properly treated to make it environmentally safe. Raw sewage should never be pumped into water. This may seem like a convenient way of disposing of it but it is highly dangerous for health. Effective sewage treatment processes should be put in place.
4. **Treatment of industrial wastes before discharge:** Factories should treat wastes before discharge and toxic substances should be converted into harmless materials.
5. **Recycle:** Recycle domestic and commercial waste safely rather than dumping it in the sea or near rivers.
6. **Promote a love for waterways:** That way, everyone in the community will be motivated to stop pollution. When we all work together, we can achieve great things.
7. **Go organic:** Organic agriculture uses far fewer chemical pesticides and fertilizers.
8. **Adherence to water laws.** Laws and legislation regarding water pollution should be strictly followed. There should be heavy penalties for those who fail to adhere to the rules.
9. **Avoid using paper bags:** Carry a shopping bag whenever you expect to go shopping. This will minimize the chances of you using a paper bag. You can also buy a portable shopping bag and always have it with you.
10. **Improve oil tanker safety:** Avoiding oil spills would remove a key cause of environmental pollution.
11. **Routine cleaning:** Wells, ands and lakes should be regularly cleaned and treated to ensure that they remain safe for human use. There should also be system of regularly testing pond and lake water.

Conclusion

Water is a basic necessity. If water pollution is not controlled, this commodity might become a commodity that only few can afford. As such, we should all take action from today onward reduce water pollution. What is more, we should encourage friends and loved ones – and those with power and authority – to do the same before it is too late.

Reference

i. *Philippe Cullet(2007) , "water law in india overview of existing framework and proposed reforms"Available at http://www.ielrc.org/content/w0701.pdf.*

ii. *Kailash Thakur,(2005) "Environmental Protection Law and Policy in India", Deep & Deep Publication ,pp 26-27.*

iii. *R.C.Das & D.K.Behra (2008), Environmental Science – Principles and Practices ;Prentice Hall of India pvt.ltd. New Delhi p.20.*

iv. *Stuart Bell & Donald McGillivray(2004),"Environmental Law ",Oxford University Press pp.552-553.*

v. *Philippe Cullet(2007) , "water law in india overview of existing framework and proposed reforms , Available at http://www.ielrc.org/content/w0701.pdf Water Pollution and Treatment 197.*

vi. *River Boards Act, 1956, available at http://www.ielrc.org/content/e5602.pdf.*

vii. *P M: Prasad, "Environmental Protection: The Role of Regulatory System in India" available at http://www.ecoinsee.org.*

viii. *Bhaskaran,G.(1998a.) Pollution Control Acts, C. Sitaraman & Co., Chennai. Ibid Hanuman Prasad v. Mendwa, AIR 1935 All 876 M.C. Mehta v Kamal Nath, 1997 1 SCC 388.*

ix. *Water (Prevention and Control of Pollution) Act, 1974, available at http://www.ielrc.org/content/e7402.pdf.*

x. *Model Bill to Regulate and Control the Development and Management of Ground Water, 2005, available at http://www.ielrc.org/content/e0506.pdf.*

xi. *P.leelakrishnan,(2008) "Environmental Law in India" LexisNexis Butterworth Wadhwa,Nagpur,p.169*

xii. *FW Pontius (1990), "Water quality and treatment" (4thedn), New York: McGraw-Hill, Inc.*

xiii. *Floating islands as an alternative to constructed wetlands for treatment of excess nutrients from agricultural and municipal wastes – results of laboratory-scale tests by Frank M. Stewart, Tim Mulholland, Alfred B.Cunningham, Bruce G. Kania and Mark T.Osterlun*