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WATER IMPACT ON HUMAN HEALTH IN MORENA DISTRICT REGION

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ABSTRACT

In the human body, water does not merely exist as a component alongside biochemical structures; rather, it is the fundamental solvent in which all life processes occur. The relationship between human existence and water has been well-known since time immemorial. Water has a unique molecular structure consisting of two Hydrogen atoms and one Oxygen atom joined by covalent bonds. This gives it the power to act as a universal solvent. Water is not just a passive carri er; it actively participates in the regulation of vital body systems. Contaminated water affects many organs and the temperature regulation of the human body, leading to various health issues. Impure water harms not only human beings but all living creatures, including animals, birds, and environmental plants. It is responsible for health deterioration and causes numerous diseases. The number of diseases caused by impure water is increasing, such as Cholera, Typhoid, Hepatitis A, Dysentery, Gastroenteritis, and Polio. These diseases cause millions of deaths every year. Therefore, we must focus on all elements and dimensions of water because it is the primary basis of life. "Water is not just a medium for living, but water itself is life." According to UNESCO's 2021 World Water Development Report, since the 1980s, freshwater use has increased by about 1% annually and has grown six-fold over the last century. Consequently, water quality is being severely affected. Urbanization, agriculture, and industrialization have all contributed to environmental pollution and degradation. This has a negative impact on water bodies (oceans and rivers) essential for life. Ultimately, this situation poses a threat to human health and sustainable social development (Xu et al., 2022). It is estimated that approximately 80% of urban and industrial wastewater worldwide is discharged into the environment without treatment. In India, the economic burden of waterborne diseases is approximately 600 million USD annually, affecting about 37.7 million Indians. Diarrhea remains a major cause of death, especially among children under 5 years of age.

Key words: Water Quality, Human Health, Waterborne Diseases, Drinking Water Contamination, Environmental Pollution, Public Health

1. INTRODUCTION

Water is a fundamental and essential requirement for humans and all living beings on Earth. It plays a vital role in the human body. About 70-73% of a healthy adult body is composed of water, making it the most essential element after Oxygen. Every cell, tissue, and organ in the human body depends on water for functionality. It plays a key role in protein folding and stabilizing the DNA Double Helix structure. When adequate water levels are maintained, it ensures the stability of cell membranes, allowing essential nutrients to stay inside and harmful toxins to be expelled. This report presents a detailed scientific and statistical analysis of water quality, availability, and its consequences on human health and the ecosystem. Water, often called the "Universal Solvent," is not only the basis of life but also central to the global economy and environmental stability. In the current global scenario, especially in developing countries like India, water resource management has become a serious challenge due to population growth, industrial expansion, and climate change.

1.1 Water and Brain Health

The brain is composed of approximately 73-75% water. Even slight dehydration can affect mental capacity: Concentration and Memory: Dehydration reduces the ability to focus and weakens memory. Mood and Stress: Low water intake increases irritability, fatigue, and anxiety (more evident in women). Driving Hazards: Research suggests that driving in a dehydrated state can be as dangerous as drunk driving because the reaction time slows down.

2 Biological and Ecological Foundations

Water is the only substance on Earth that naturally exists in three states: Solid, Liquid, and Gas. This cycle is crucial for regulating the Earth's climate system. Biologically, water is indispensable for cellular metabolism, nutrient transport, and body temperature regulation. Scientifically, its high heat capacity and polar nature make it an ideal medium for biochemical reactions. Ecologically, water systems like rivers, lakes, wetlands, and oceans support global biodiversity. Freshwater ecosystems provide water for humans and essential services like flood mitigation, carbon sequestration, and nutrient cycling. However, about 85% of global wetlands have been lost in the last 300 years, a serious warning for environmental balance.

2.1 Impact on Human Health:

Pathogenic and Chemical Risks The link between human health and water quality is direct and complex. Consumption of contaminated water and lack of sanitation are the largest causes of preventable deaths globally. According to WHO data, at least 1.4 million people died in 2019 due to inadequate Water, Sanitation, and Hygiene (WASH) services. Safe drinking water is defined as water that does not pose any significant health risk over a lifetime of consumption. Waterborne diseases pose the greatest risk to infants, small children, and the elderly. Sources of Water Pollution 1. Rivers: Major natural sources like the Ganges, Yamuna, Narmada, and Godavari are becoming sources of pollution due to the discharge of industrial waste and sewage. 2. Wells and Tube-wells: Popular in rural areas for groundwater, but now becoming centers of pollution due to plastic waste and garbage disposal. 3. Lakes and Ponds: Static sources vital for local ecosystems; currently plagued by urban waste. 4. Rainwater: The primary source of water. While rainwater harvesting helps, pollution often mixes with runoff. 5. Dams: While they provide water to dry areas, stagnant water in reservoirs can become a breeding ground for diseases. 6. Glaciers: Sources of perennial rivers in North India; melting rapidly due to pollution from ACs and vehicles.

2.2 Sewage and wastewater:

Wastewater includes used water. The sources of wastewater include commercial, industrial, and agricultural operations (think metals, solvents, and toxic sludge), as well as our sinks, showers, and toilets (think sewage). The term also refers to stormwater runoff, which happens when rainfall carries chemicals, oil, grease, road salts, and debris from impermeable surfaces into our waterways. According to the UN, over 80% of wastewater worldwide returns to the environment untreated or un-reused; in some least-developed nations, that percentage rises to 95%. Every day, approximately 34 billion gallons of wastewater are processed by wastewater treatment facilities in the US. These facilities filter out heavy metals and hazardous chemicals from industrial waste, as well as pathogens, phosphorus, and nitrogen from sewage, before returning the cleaned waters to rivers. Then everything works out fine. However, the EPA estimates that over 850 billion gallons of untreated wastewater are released annually by our country's ageing and easily overloaded sewage treatment systems.

2.3 Oil pollution:

The majority of oil pollution in our oceans is caused by consumers, including the oil and gasoline that leak from millions of cars and trucks every day. Large spills may make the news, but consumers are more responsible than any other factor. Furthermore, landbased sources like cities, farms, and factories account for almost half of the 1 million tonnes of oil that are thought to enter marine environments annually rather than tanker spills. About 10% of the oil in international waters is caused by tanker spills, while roughly a third is caused by regular shipping operations, including both legal and illicit discharges. Seeps are natural openings in the ocean floor that allow oil to naturally escape.

2.4 Radioactive substances:

Pollution that releases more radiation than the environment naturally produces is referred to as radioactive waste. The production and testing of military weapons, nuclear power plants, uranium mining, and hospitals and universities that use radioactive materials for research and medical purposes are the main sources of it. Because radioactive waste can linger in the environment for thousands of years, getting rid of it is very difficult. Consider the decommissioned Hanford nuclear weapons production site in Washington, where 56 million gallons of radioactive waste need to be cleaned up over the course of 2060, at an estimated cost of over $100 billion. Contaminants that are improperly disposed of or accidentally released pose a threat to marine resources, surface water, and groundwater.

2.5 Groundwater pollution:

Rainfall turns into groundwater, one of our most valuable yet least visible natural resources, when it penetrates deeply into the ground and fills the voids, fissures, and porous areas of an aquifer—basically, an underground water reserve. For drinking water, almost 40% of Americans depend on groundwater that is pumped to the surface of the earth. It is the only source of freshwater for some people living in rural areas. When pollutants, such as fertilizers, pesticides, and waste from septic tanks and landfills, seep into an aquifer, they contaminate groundwater and make it unfit for human consumption. Eliminating pollutants from groundwater can be expensive and challenging. An aquifer that has been contaminated may not be usable for decades or even millennia. Because groundwater seeps into streams, lakes, and oceans, it can also disperse pollution far from the original source.

2.6 Health of Heart, Kidneys, and Skin

Blood Circulation: Blood is over 90% water. Low water makes blood thicker, forcing the heart to work harder. Kidney Stones: Dehydration makes urine concentrated, leading to the formation of calcium and uric acid crystals (stones). Detoxification: Adequate water helps kidneys flush out toxins like urea and creatinine. Constipation Relief: The large intestine absorbs water; lack of water leads to hard stools and constipation. Skin Glow: Water maintains skin elasticity and keeps it hydrated. Water Contamination and Cancer According to the WHO (2020), the number of cancer patients was 19.3 million, with deaths rising to 10 million. One in five people globally is likely to develop cancer in their lifetime. How Carcinogens Enter Water: Contamination of Source: Natural or industrial waste. Treatment Processes: Certain chemicals used during purification. Distribution: Old pipelines or storage systems. Major Harmful Elements: Arsenic: Deeply linked to skin, kidney, and bladder cancer. Nitrate and Chromium: Also linked to cancer risks. Smoking Interaction: If a person smokes and drinks arsenic-laden water, the risk of lung cancer increases manifold. Practical Approaches for Chemical Standards WHO Guidelines for Drinking-water Quality (GDWQ) are often used as standards. Where treatment is expensive or difficult, the following options can be adopted: 1. Interim Limits: Setting temporary, less strict limits while working toward a long-term goal. 2. Exemptions: Allowing temporary relief for specific regions based on resource availability. 3. Derogations: Time-bound relaxations to implement improvements. 4. Local Safe Limits: Determining safety based on local scientific data. 5. Radionuclides Monitoring: Prioritizing monitoring in areas with natural radioactivity in soil/rocks

3. CONCLUSION

Water is a gift of nature/God to humanity. However, humans have exploited water for progress. Based on research, although many schemes are running in India and globally to improve water quality, the situation is worsening year by year. Research shows that if water is left for "self-healing" with reduced human interference, it can treat itself. For example, during COVID-19 lockdowns, human interference in rivers and lakes decreased significantly. Consequently, even highly polluted rivers like the Ganges showed signs of self-purification. Just as we sometimes allow the human body time to heal itself, we must reduce the factors polluting nature. Stopping pollution from factories and chemical industries will immediately improve water quality because nature is its own doctor. If we do not focus on water pollution soon, the consequences—

currently visible in human health and the environment—will eventually destroy the other elements of life (Air, Earth, Space), making survival extremely painful for all living beings.

REFERENCES

1. World Health Organization. Public Health Impact of Pesticides Used in Agriculture. England (1990).
2. Annual Report 2021-22, Dept of Health and Family Welfare, Govt of India.
3. Ansari, Z.Z., & Akhmatov, S.V. (2020). Impacts of Water Pollution on Human Health: A Case Study of Delhi.
4. WHO (2012). Guidelines for drinking water quality: Uranium in drinking water. Geneva.
5. Halder, J.N., & Islam, M.N. (2015). Water Pollution and its Impact on the Human Health. Journal of Environment and Human.
6. Kumar, S. et al. (2017). Water Pollution in India: Its impact on Human Health. Int. Journal of Applied Environmental Sciences.
7. Satyanarayana, D. et al. (2012). Water Pollution in India: Its effects on human health.
8. Andreea, M.D. (2018). Water Pollution and Quality Assessment of Major Transboundary Rivers. Journal of Chemistry.
9. WHO Guidelines for Drinking Water Quality (pp. 65-66).
10. UNESCO World Water Development Report 2021.
11. PHED Madhya Pradesh (phed.mp.gov.in)
12. Impact of Water Pollution on Human Health and Environment and Its Remedial Techniques: A Review Kumbha Ram Mahala, International Journal of Research and Volume11;Issue:12;December2024
    E-ISSN: 2349-9788; P-ISSN: 2454-2237
13. Chen, B., Wang, M., Duan, M., Ma, X., Hong, J., Xie, F., et al. (2019). In Search of Key: Protecting Human Health and the Ecosystem from Water Pollution in China. J. Clean. Prod. 228, 101–111. doi: 10.1016/j.jclepro. 2019.04.228.
14. Cheung, W. H. S., Chang, K. C. K., Hung, R. P. S., and Kleevens, J. W. L. (1990). Health Effects of Beach Water Pollution in Hong Kong. Epidemiol. Infect. 105 (1), 139–162. doi:10.1017/s0950268800047737.
15. Cheung, W. H. S., Hung, R. P. S., Chang, K. C. K., and Kleevens, J. W. L. (1991). Epidemiological Study of Beach Water Pollution and Health-Related Bathing Water Standards in Hong Kong. Water Sci. Technol. 23 (1-3), 243–252. doi:10. 2166/wst.1991.0422.
16. Chowdhary, P., Bharagava, R. N., Mishra, S., and Khan, N. (2020). Role of Industries in Water Scarcity and its Adverse Effects on Environment and Human Health. Environ. Concerns Sustain. Dev., 235–256. doi:10.1007/978- 981-13-5889-0_12.
17. Babu MNS, Somashekar RK, Kumar SA, Shivanna K, Krishna-murthy V, Eappen KP (2008). Concentration of uranium levels in groundwater. Int J Environ Sci Techno. 5(2):263–266.
18. WHO (World Health Organization) (2012) Guidelines for drinking water quality uranium in drinking water. WHO, Geneva.
19. Patil. P. N, Sawant |D. V, Deshmukh R. N (2012). Physicochemical parameters for testing of water-A review", International Journal of Environmental Sciences, Volume 3, No 3, ISSN 0976-4402. 20. Ramesh B., (2019), "Physicochemical Analysis of Quality of Drinking Water in District Fatehpur in Uttar Pradesh, India" Volume 6, E-ISSN 2348-1269, ISSN 23495138.