



Groundwater Contamination in Tamil Nadu

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Abstract

Groundwater contamination occurs when man-made products such as gasoline, oil, road salts and chemicals get into the groundwater and cause it to become unsafe and unfit for human use. Ground water are mostly contaminated due industries like dying and tanneries. The waste water in the industries are not properly discharge and it discharged into river it also contaminate the groundwater. Most of the chemicals like chromium, lead, nickel etc., are major cause of groundwater contamination. Due to un proper disposal of waste it also cause the ground water.

Keywords: Contamination, tannery, discharge, disposal

Introduction

Groundwater contamination occurs when man-made products such as gasoline, oil, road salts and chemicals get into the groundwater and cause it to become unsafe and unfit for human use. Materials from the land's surface can move through the soil and end up in the groundwater. For example, pesticides and fertilizers can find their way into groundwater supplies over time. Road salt, toxic substances from mining sites, and used motor oil also may seep into groundwater. It is also possible for untreated septic tank and toxic chemicals from underground storage tanks and leaky landfills to contaminate groundwater.

Groundwater contamination in Tamil nadu

In tamilnadu it is estimated more than 50,000 ha agricultural productive lands have been contaminated with chromium alone due to tannery waste disposal in Tamil nadu. The major ground water contamination is due to cadmium and lead. The study determined by BIS, says groundwater in Dindigul, Thiruvallur, Kanchipuram have a lead content of more than 0.01 mg per litre. The cadmium level in ground water is prescribed by WHO is $<1\mu\text{g}/\text{litre}$. But in Chennai, the samples collected in 45 locations the cadmium and nickel 15 and 7 times higher than the WHO prescription. The ground water is mostly contaminated in Vellore and Thiruppur district in Tamil nadu.

In Vellore there are many leather tannery and dying industries it's waste water are discharged into palur river. It's affects the under ground water.

In Thiruppur, there are many dying industries they discharged the effluents into the river it's the major cause



of ground water contamination.

Ground water in 19 districts it contains 1.5mg/litres of fluoride content. In April 2021, the ground water level was 6.06 metres and it decreased in March by 5.70 metres. In between March and April in 2022 the ground water level is decreed by 0.77 metres.

Cuddalore and Erode are two other districts where groundwater was found to be contaminated with chromium.

Dindigul is a district with a thriving tanning industry. Tanning or leather manufacturing factories are often said to release toxic effluents. One among the toxic effluents released by these factories is chromium which is produced as a result of the oxidation process used in the tanning industry.

In Pudukkottai, Groundwater quality parameter of total dissolved substance (TDS), sodium adsorption ratio (SAR), electrical conductivity (EC), sodium ion (Na⁺), calcium (Ca⁺²), magnesium (Mg⁺²), bicarbonate (HCO₃⁻), chlorine (Cl⁻) and pH has been analyzed. It says that there is no area of safe groundwater (no restriction) or low restriction of groundwater for agriculture. There is no area of safe groundwater for irrigation. This may be due to the severe and inappropriate application of chemical fertilizer for intensive agriculture and in the Pudukkottai district.

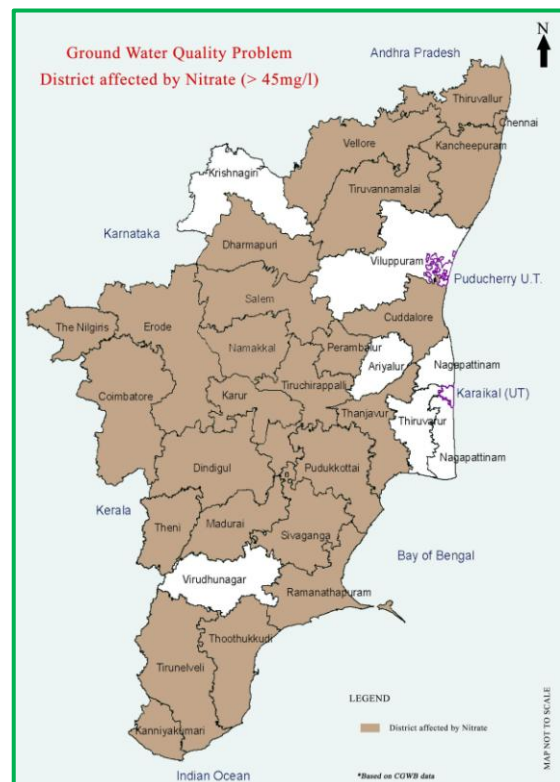
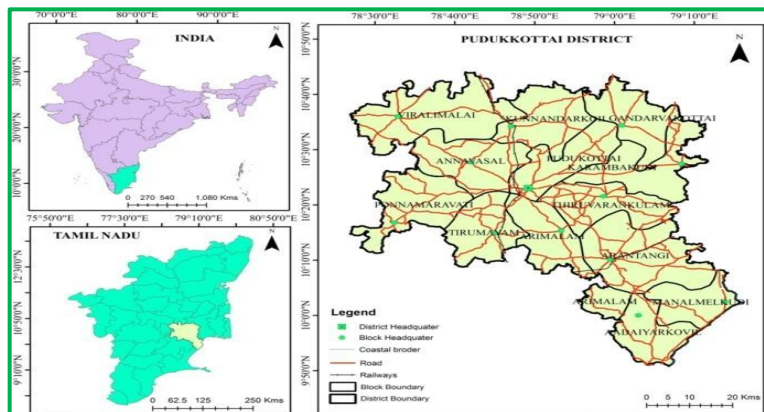


Nickel affected districts

Nickel is more mobile in the soil after acid rain, thereby increasing its concentration in groundwater. Ground water contain active nickel concentrations depending on factors such as soil type, sampling depth, pH, etc. Nickel concentration levels seem to be correlated more with its naturally occurring abundance in soil, minerals, rock, and soil dust.

Chloride affected districts

Natural Groundwater derived from rainwater may have chloride concentrations less than 10 mg/L. With chloride leached from chemical fertilisers on agricultural soils, or from wastewater discharged onto the land surface, the chloride concentration in the groundwater may increase to 20 or 30 mg/L or more. These concentrations are too low to affect the taste of water, but they can be measured in groundwater samples and used to indicate contamination and provide information about potential sources.



Fluoride affected districts

The concentration of fluoride in the groundwater is maximum. However, most of the world's groundwater is observed to cross the fluoride concentration standard limit, as suggested by the WHO. Consequently, studying the sustainability of excessive fluoride in groundwater and its hazardous impact on people is critical worldwide.

Conclusion

Most available fresh water is groundwater. Groundwater is an important source for our drinking water and stream flow. Although most of our groundwater supplies are clean, they are, due to human neglect and carelessness, vulnerable and threatened. Some ways to prevent groundwater contamination are as follows: Proper disposal of effluent from the dying industries. Avoid using fertilizers in agricultural lands. Do not discharge the waste water from industries into river. Pump and treat is a common method for cleaning up groundwater contaminated with dissolved chemicals, including industrial solvents, metals, and fuel oil.

References

1. The news minute
2. The times of India
3. An overview of groundwater quality in Tamil nadu
4. R. Kuttimani, A. Raviraj², B.J. Pandian and Gouranga Kar. Fluoride contamination, consequences and removal techniques in water: a review.
5. Shaz Ahmad a, Reena Singh, Tanvir Arfin and Krishna Neeti, Chloride, Salinity, and Dissolved Solids ACTIVE By Water Resources Mission Area Geo-spatial analysis of irrigation water quality of Pudukkottai district, Yuvaraj ramachandran and Muthulakshmi.

