

Aquifer Nitrate Concentration and Associated Human Health Risk Assessment of Haridwar District of Uttarakhand, India

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Groundwater contamination by nitrate is a matter of global concern and nitrate is a widespread contaminant of ground and surface water worldwide. The aquifer of Haridwar district is mainly contaminated by nitrate-nitrogen. Nitrate contamination associated with N-based fertilizers use, geology of sub-surface of the soil layer, pit latrines, sewerage, industrial effluents, and manure storage Aquifer Nitrate Concentration and Associated Human Health Risk Assessment of Haridwar District of Uttarakhand, India. The study aims to investigate the possible health hazards in local residents of Haridwar, Uttarakhand, India. Amount of nitrate in groundwater of Haridwar region in ranges between 0.1 - 89mgL⁻¹. Some locations showed a high level of nitrate than the safe limits as decided by the Bureau of Indian standards (higher than 45 mgL⁻¹) and the World Health Organization (50 mg L⁻¹). There is strong & a direct relation between drinking water nitrate ingestion and associated health risks like methemoglobinemia (Blue baby syndrome) among infants and specific types of cancer. The crude current rate of cancer in Uttarakhand is 91 (incident rate per 100000 in 2016). Nearly 59 deaths are reported due to cancer only in Haridwar district during the year 2018-19. The study tends to show that the people of Haridwar district are at risk of chronic toxicity due to excess intake of nitrate in drinking water. Therefore, this is a call to take some immediate preventive measures to safeguard the health of local residents.

Keywords: Groundwater, Nitrate Pollution , Human Health Risk