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ASSESSING NITRATE AND FLUORIDE CONTAMINATION IN DRINKING WATER AND THEIR HEALTH RISK ASSESSMENT IN DROUGHT PRONE AREA OF GV-35 WATERSHED OF AURANGABAD DISTRICT, CENTRAL INDIA

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Abstract

The GV-35 watershed of Aurangabad district, Maharashtra, India is the present study area for health risk assessment of nitrate and fluoride in drinking water for rural residents. The study area covers the Deccan basaltic rocks of late Cretaceous to Palaeocene age (68-62 million years).In this investigation, the geochemical progression in a total of twenty-three groundwater samples was assessed according to standard methods. Higher concentration of nitrate (> 45 mg/L) was identified in 39% of the groundwater samples, whereas fluoride concentration exceeded the threshold value in 17% of samples. In addition, health risk evaluation showed that the total health hazard, due to nitrate and fluoride through oral intake, was much higher than that through the dermal pathway. Children were found to be at high risk due to consumption of nitrate and fluoride contaminated drinking water.To make sustainable agriculture for developing economic and social sectors in the study area, special attention should be paid to nitrate contamination of the groundwater resources. Effective measures need to be taken through public awareness, pollution control, and remediation of contaminated areas and it is essential to regulate fertilization, to properly treat domestic waste and wastewater. Drinking water requires continuous water quality monitoring along with effective management practices to avoid excessive extraction of groundwater.

Keywords: Drinking water, Nitrate pollution, Health risk assessment, Groundwater, GV-35 watershed, Aurangabad, India