

NITRATE CONTAMINATION IN GROUNDWATERS OF HIREHALLA WATERSHED OF KOPPAL DISTRICT, KARNATAKA: A GIS APPROACH

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Abstract

The present investigation aims to study nitrate anion concentration in groundwaters of Hirehalla watershed in Koppal district, Karnataka using Systronics Spectrophotometer at 420 nm. 61 and 68 representative groundwater samples each were collected during pre-and post-monsoon seasons respectively. Physico-chemical analyses were performed for the above samples to check for its suitability for different purposes. Nitrate concentration in the watershed ranges from 3 Mg/L to 165 Mg/L with an average of 29 Mg/L during the pre-monsoon while during the post-monsoon it ranges from 5.5 Mg/L to 155 Mg/L with an average of 47 Mg/L. Spatial variation map of nitrate concentration for pre-monsoon shows high concentration in the southern part with moderate to normal concentrations in central and some parts of the south, while during the post- monsoon it shows moderate concentration in central and eastern parts and high concentration in rest of the study area. This high concentration of NO_3 in the watershed can be attributed to application of fertilizers and pesticides in agricultural practices. The Bureau of Indian Standards (2012) permissible range for nitrate is <45 Mg/L. Excessive concentration of nitrate in groundwater has adverse effects on the proper functioning of human health particularly in infants, which leads to a condition called Methemoglobinemia commonly also known as the Blue Baby Syndrome. Thus, the present study on nitrate concentration in the hard rock Hirehalla watershed using GIS technique has proved to be very helpful in assessment of its water quality.

Keywords: Hirehalla Watershed, Koppal, Karnataka, Nitrate, Visible-Spectrophotometer, GIS.