

Spatial Variability in Groundwater Quality of Kalayat Block of Kaithal District, Haryana

Parveen Rathi¹, Ramprakash² and Naveen Rathi³

^{1,2}Department of Soil Science, CCS Haryana Agricultural University, Hisar-125004

³Department of agronomy, CCS Haryana Agricultural University, Hisar-125004

E-mail: rathiparveenrathi@gmail.com

Abstract—Kalayat block lies in the south-western part of Kaithal district between 26.67° to 26.77° N latitude and 76.25° to 76.27° E longitudes. The block consists of 28 villages acquiring a total area of 319 Km². The survey and characterization of underground irrigation water of Kalayat block was undertaken during October to December, 2015-16. Water samples were collected randomly at a distance of 1-2 km by thorough the whole block. The electrical conductivity in Kalayat block ranged from 0.74-7.72 dSm⁻¹ with a mean of 3.60 dSm⁻¹. The lowest and highest value of EC i.e. 0.74 and 7.72 dSm⁻¹ was recorded in Kheri Serkhan and Mator village, respectively. Nearly 88% of the water samples showed EC below 6 dSm⁻¹ and it ranged from 0.74 dSm⁻¹ to 7.72 dSm⁻¹ with maximum value at Mator village. Residual sodium carbonate (RSC) and sodium adsorption ratio (SAR) varied from nil to 6.68 me L⁻¹ and 5.08-18.05 (m mol L⁻¹)^{1/2}, respectively. Concentration of Na⁺, Mg²⁺, Ca²⁺, Cl⁻ and SO₄²⁻ increased with increase in the EC of the water samples and the magnitude of increase in Na⁺, Mg²⁺, Cl⁻ and SO₄²⁻ concentration was much higher than Ca²⁺. Concentration of HCO₃⁻ and CO₃²⁻ were also found to be in appreciable quantities whereas NO₃⁻ was recorded in low quantity and their concentration did not show any relation with EC of groundwater. Based on AICRP classification, 13.70%, 60.79% and 25.49% samples of groundwater were of good quality, saline and alkali in nature, respectively. In saline group, 21.57% and 39.22% were marginally saline and high SAR saline, respectively. Among the alkali group, 13.73% samples were marginally alkali and 11.76% were highly alkali in nature. No particular trend in the spatial variation of groundwater quality was found but maximum numbers of samples were found in saline category.

Keywords: Groundwater quality, survey, electrical conductivity, RSC, SAR.