

Suitability of Groundwater for Drinking in Valukkai Aru Drainage Basin

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The surface stream, Valukkai Aru, in Jaffna Peninsula, Sri Lanka is only active during the monsoon and there are no reservoirs of a perennial nature. There are complaints by farmers regarding salinity problem in this area in the recent past. Freshwater availability is limited in the Valukkai Aru drainage basin area. Hence the study was aimed to assess the suitability of groundwater for drinking purpose. Initially, 114 wells were selected and groundwater samples were tested only for pH and EC. Based on EC, pH, land use and well type, 40 wells were chosen and groundwater samples were collected during the driest period, June 2020. Groundwater sample was analyzed by the standard methods for pH, electrical conductivity, total alkalinity, total hardness and chloride. Measured data were used to assess the suitability of groundwater for drinking purpose by comparing with the Sri Lanka Standard (SLS). Out of selected 114 well, only 8% of the selected wells were suitable for drinking purpose since the electrical conductivity of the groundwater was below the SLS desirable level of 750 $\mu\text{S}/\text{cm}$. Around 33% of the wells were not suitable for drinking or irrigation purpose since EC values were above the 3500 $\mu\text{S}/\text{cm}$. But most of the sample pH was within the range of 6.5 to 8.5. Total Hardness values were ranged between 232 - 3921 mg/L and 95% of the samples exceeded the SLS values for drinking water (250 mg/L) due to the dissolution of limestone and the substantial contribution from the weathering of limestone. Total alkalinity varied from 88 to 657 mg/L and 75% of the wells were above the recommended SLS desirable level of 200 mg/L. The concentration of chloride was between 47 and 8830 mg/L and 75 % of the samples exceeded the SLS desirable value for drinking water. High chloride concentration indicates the intrusion of seawater. The results reveals that the groundwater is not entirely fit for drinking with respect to EC, total hardness, total alkalinity and chloride.

Keywords: Electrical conductivity, Groundwater, Hardness, Quality, Valukkai Aru