Geophysical Techniques and Geochemical Analysis for Identification of Potable Groundwater — A Case study from Morawewa Area

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Appropriate accessibility to drinking water is a major concern throughout the world. Having access to safe drinking water leads to improvements in health of communities while achieving local (SLS) and international (WHO) Standards, which is a basic measuring-yard of the development of a nation. Dry-zone of Sri Lanka has recently suffered due to lack of drinking water availability and this trend is set to be climbed for damaging heights, as time passes. This study was carried out selecting Morawewa as a sample area, which is situated in the North Central part of Sri Lanka and adjoining the Trincomalee district, bounded by latitude 8° 35' 0" - 8° 38' 0" North and the longitude of 80° 50' 0" - 81° 04' 0" East. The present study aims to detect the groundwater potential in Morawewa area of Trincomalee District, Sri Lanka using electrical measurement and geochemical analytical methods. Electric resistivity data interpretation was carried out by using Schlumberger configuration with electrode spacing (AB/2) of 100 m distance. The resistivity curves were analyzed with curve matching techniques along with the help of RESIST Software. The results of quantitative interpretation of geophysical data indicated that the layer system having minimum of two layers to a maximum of three layers in the area and the maximum depth to the bedrock was 17.9 m. Hence based on the range of resistivity values and graph trending, the weathered and fractured zones were interpreted. The contacts between certain saturated and dry formation zones having different resistivity values were identified from the interpreted resistivity curve and the range of resistivity value. Moreover, geochemical analysis revealed phosphate contamination in the dug well water samples.

Keywords: Geophysical survey, Schlumberger, 1-Dresistivity survey, VES, Groundwater explorations, Morawewa , Trincomalee , Sri Lanka