

Identification of Spatial Distribution and Issues related to Groundwater Quality in Palugaswewa DS Division in Anuradhapura District

V. P. I. S. Wijeratne and Ranjana U. K. Piyadasa

Department of Geography, University of Colombo, Sri Lanka

ABSTRACT

Management of groundwater is very important for humans as it is a prime resource for sustenance of rural life. Groundwater is one of the main water sources for agriculture and domestic purposes in developing countries like Sri Lanka. Since a considerable percentage of the population is dependent on groundwater for drinking and agriculture, its management has become a serious concern. The anthropogenic factors like agriculture, urbanization and industrial processes have direct and indirect impacts on groundwater quality. This study was conducted in the Horiwila cascade in Palugaswewa Divisional Secretariat (DS) division of Anuradhapura District with the objective of identifying the spatial distribution pattern and issues related to groundwater quality.

This study was carried out for a period of 3 months in 2011. Well distributed 104 number of wells were selected for collecting water samples. The parameters such as pH, Electrical Conductivity (EC), salinity, Na, K, Ca, Mg, Fe, Cl, bacterial pollution and heavy metal were tested in the samples. Water quality analysis was carried out according to the standard methods. The study helped to prepare a spatial distribution map of Electrical conductivity (EC) and pH using the Geographical Information System (GIS) package (ArcMap 10.0). A questionnaire survey was conducted to obtain information from people. Results revealed that in this area, only less than 10 wells were used for drinking due to high salinity. Electrical conductivity in well water varied over the area. It was in the range of 80 and 7390 micro-Siemens per centi meters ($\mu\text{S}/\text{cm}$). Most of the wells showed high conductivity and there was a high salinity problem. All these concentrations were high in the upper part of the study area and in fewer locations Ca^{2+} , Mg^{2+} and Cl^{-} has been exceeded the recommended levels for drinking. The study identified that most of the well water in the study area can not acceptable for drinking purpose.

INTRODUCTION

Shallow groundwater is the main drinking water source in rural areas in many developing countries and good quality groundwater is a prime factor for the sustenance of rural life. More than 90% of the rural population use groundwater for drinking and other domestic purposes in Sri Lanka. The groundwater is believed to be comparatively much cleaner and free from pollution than surface water (Balakrishnam *et al.*, 2011). It is a valuable natural resource that is important for human health and processes of the ecosystem. The groundwater can become