CHARACTERIZATION OF GROUND WATER HARDNESS WITH SPECIAL REFERENCE TO POLPITHIGAMA DIVISIONAL AREA IN KURUNEGALA DISTRICT AND POTENTIAL USE OF PLANTS TO REDUCE WATER HARDNESS

Submitted by

Saranga Iresh Fonseka

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ABSTRACT

Deteriorating quality and increasing hardness of groundwater, the primary source of potable water, has been observed by the inhabitants of areas where chronic kidney disease of unknown etiology (CKDu) is prevalent in Sri Lanka. Present study was conducted during 2011, to determine the groundwater hardness and presence of other ions in ground water and soil. The total hardness and other ions such as Calcium, Magnesium, Chloride, Nitrate and Sulphate in most of the water samples, collected from the study area were higher than the recommended values of Sri Lanka Standards. Results of the present study suggested that the toxic trace elements such as Arsenic (As) is present in the soils of the study area and thus investigations have been carried out to test the inorganic and organic fertilizer for As. The highest amount of arsenic contamination was reported from imported Triple Super Phosphate (TSP) used in cultivation of rice. The organic fertilizer prepared from natural sources were analyzed and confirmed there were only insignificant amounts of arsenic present in them. Continuous use of arsenic contaminated fertilizer may have elevated the arsenic level in soil and thus the arsenic may enter into food chain. Findings imply the potential use of amply available *Terminalia arjuna* (Common name: Kumbuk) seeds and plants, *Moringa oleifera* seed suspension and *Moringa oleifera* seed oil, some aquatic plants such as *Eichhornia crassipes, Pistia stratiotes and Lemna minor L.* to reduce total hardness in drinking water and thus, the potential for developing a low-cost home filter units affordable by the local inhabitants and apply phytoremediation system to remove hardness from water.

Keywords: Hard water, CKDu, Fertilizer, Groundwater, Phytoremediation