# MSc Degree in Environmental Science

# IMPACT OF GROUND WATER QUALITY PARAMETES ON CHRONIC KIDNEY DISEASE OF UNKNOWN ETIOLOGY (CKDu) IN THUNUKKAI DIVISION IN MULLAITIVU DISTRICT

A dissertation submitted

by

**MRS.KALAIVANI GOBALARAJAH**

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**Abstract**

Increase in the number of cases in Chronic Kidney Disease of Unknown etiology (CKDu) in Sri Lanka has become an environmental health issue of national concern. There is scientific consensus that CKDu is one of the fatal diseases in Sri Lanka with no identified causes. Patients were mostly recorded in dry zone and were rural farmers with low income and age between 40 to 70 years. Literature provides strong evidence that CKDu has a profound relationship with drinking water quality. Even though Northern Province is not identified as a high risk province, there is an increasing trend of CKDu after the end of civil war in the Northern territory.

The present study was conducted inThunnukkai Division in Mullaitivu District. The details of CKDu patient were taken from Ministry of Health Office, Mallavi. The samples were selected by using stratified purposive random sampling method which represented 29.2% of total CKDu patients in Thunnukkai Division. The objectives of this study were to know the socio demographic pattern of CKDu patients, analyze the water quality parameters and to assess the correlation between water quality parameters and CKDu patients.

Pretested structured questionnaire was administrated to collect the data from CKDu patients. Among them 80% were male with an age range of 30-80. 88.57% patients were farmers. 25.71% and 20% people were involved in smoking and taking alcohol respectively. 17.17% and 42.8% were suffered with diabeties and hypertension respectively. Water quality parameters including turbidity, pH, electrical conductivity, salinity, Total Dissolved Solid, nitrate, fluoride, phosphate, total hardness, Ca, Mg, Na, K, sulphate, arsenic and cadmium were determined. In more than 50% water samples electric conductivity, salinity, Total Dissolved Solids, total hardness and Na levels were higher than the respective levels for Sri Lanka drinking water standards. The association between serum creatine excreated by CKDu patients and water quality parameters were determined by using regression model, where the water quality parameters tested in previous literature were considered. They were nitrate, fluoride, phosphate, Total Dissolved Solid, total hardness and arsenic content. CKDu shows significant negative relationship with phosphate and positive relationship with Total Dissolved Solid and Arsenic content of the water in Thunnukkai region in Mullaitivu District. Owing to low