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DETERIORATION OF COASTAL GROUNDWATER QUALITY IN RAMESWARAM ISLAND OF RAMANATHAPURAM DISTRICT, SOUTHERN INDIA

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A study was carried out in the South-West, North-East and North-West segments dividing the local area of Rameswaram Island to characterize the physico-chemical characteristics of 87 groundwater samples which include pH, electrical conductivity (EC), total dissolved solids (TDS), salinity, total alkalinity (TA), calcium hardness (CH), magnesium hardness, total hardness (TH), chloride and fluoride. heavy inorganic load in majority of the groundwater samples has been estimated due to the salinity, TDS, TH and chloride beyond the threshold level which substantiates the percolation of sea water into the freshwater confined zones. The Water Quality Index and Langeleir Saturation Index have also been calculated to know the potable and corrosive/incrusting nature of the water samples. The results are interpreted based on statistical tools. Greater than 80 % of the samples were found to have exceeded the limit of WHO drinking standard especially in TDS, CH, TA and chloride. The signature of salt-water intrusion is observed from the ratio of $Cl/CO_3^{2-} + HCO_3^-$ *and TA/TH. A proper management plan to cater potable water to the immediate needs of the people is to be envisaged.*

Key words: water quality, coastal area, seawater intrusion, Langeleir saturation index.

Introduction

According to the reports of UNICEF and World Health Organization (WHO), every year about 2 million people die from diarrhoeal diseases and much of the disease burden is caused by contaminated drinking water and inadequate sanitation (Kaufmann, 2007). Groundwater is highly valued because of certain properties not possessed by surface water (Goel, 2000). The unscientific and inefficient use of this vital resource (water) is contributing to its increasing scarcity and sharp deterioration in its quality (Romani, 2007). Presently several millions of people are affected by fluorosis caused by its