

Physico-chemical characteristic changes of soil and groundwater in tsunami affected southern Sri Lanka

*T.H.Y. Dharmasena¹, R. U. K. Piyadasa², K. D. N. Weerasinghe¹, J. A. Liyanage³,
W.A.D.C.S. Weerasinghe¹*

¹Department of Agricultural Engineering, University of Ruhuna, Mapalana, Kamburupitiya

²Department of Geography, University of Colombo, Colombo

³Department of Chemistry, University of Kelaniya, Kelaniya

Abstract

Asian Tsunami tragedy had a big impact to the southern Sri Lankan coastal strip of groundwater. The Previous studies conducted in the southern coastal belt after the tsunami indicates that the groundwater electrical conductivity (EC) increased from 300 to 5000 micro siemens/ cm. The main objective of the present research study was to identify the variation of physiochemical characteristics of soil and groundwater in Tsunami affected southern coastal belt. The study was conducted during 2006 December to 2007 June in coastal belt from Midigama to Kudawella in southern Matara district, which has been seriously affected by the tsunami waves. 48 auger points were constructed along thirteen parallel lines from sea in every 4km distance. The exact position of sampling points was identified by GPS. The soil sampling was done at the surface layer and moreover in every 50 cm up to water table by using a manual auger. Water samples were taken from auger holes and from nearest dug wells to compare the physiochemical characteristics of the groundwater. The study helped to prepare Electrical conductivity, Total dissolved solids and pH distribution maps of soil and groundwater in the tsunami affected area using the GIS package. A closed relationship was identified between soil and groundwater salinity. Electrical conductivity of the soil and groundwater in the study area was changed in the range of 11.3 to 796 μ siemens/cm and 346 to 5690 μ siemens/ cm respectively. pH values varied from 6.8 to 7.4. This result revealed that the Electrical conductivity and Total dissolved solids of ground water was high in the area after the tsunami and significantly correlated with Electrical conductivity of the soils (Correlation value is 0.82).

Keywords: EC, Southern Coastal Belt, Physiochemical Characteristics of Soil