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Groundwater quality in Polwathumodera river basin due to Saline water Intrusion (Case study in Weligama – Southern Sri Lanka)

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Abstract

Saline water intrusion due to tidal waves and groundwater quality changers in the Polwatumodera river basin area in southern region of Sri Lanka was studied selecting 23 dug wells and 10 river points along the river in the distance of 4 km from sea. The selected dug wells are sunk into the permeable quaternary sand depósits overlying Precambrian granite gneiss and main unconfined aquifer consist with calcareous sand stone. The aquifer in the river basin area is very permeable and hydro geological conditions are very favorable for salt-water intrusion. Continues monitoring was conducted in the dug wells and river with respect to Groundwater levels, Electrical conductivity (EC), Total dissolved solids (TDS) in monthly interval from May to November 2006. The results of the study help to prepare EC, TDS and pH distribution in the river due to tidal waves using the GIS package Arc view. Hydrographs were prepared to identify groundwater quality changers with respect to atmospheric precipitation in study period.

According to the EC, TDS and pH variations within the cross-sectional area of the river is affecting the tidal wave from sea. High tide morning period denser saline water distributes near to bottom of the river basin and values are change from close to sea 6500 to 10250 μ siemens/ cm and salinity levels are change nearly 3.5 km distance from sea. Low tide evening period's salinity levels are low values indicates close to river banks due to groundwater recharge. The characteristic of the hydrograph provides a conclusion, unconfined quaternary aquifer groundwater level intimately related to atmospheric precipitation and salinity of the dug wells close to river bank relatively high and values are in the range of 1500 to 700 μ siemens/ cm.

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