

Effect of Pumping Duration on Irrigation Water Quality at Farmer's Field of Kaluthawalai Coastal Village of Batticaloa District

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ABSTRACT. Rapidly growing human populations with its attendant needs for water and food supplies have resulted in global exploitation of available water and land resources. Over exploitation of groundwater has become a common issue along the coastal areas of Batticaloa district and consequently, many coastal regions in the district experience extensive saltwater intrusion in aquifers resulting deterioration of the quality of groundwater resources. Therefore, this study was conducted during the period between July to August 2009, with a view of assessing irrigation water quality with pumping duration at the farmers field of Kaluthawalai coastal village. The irrigation water samples were collected from wells in different locations at 30 minutes time interval. Collected water samples were analyzed for pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), cation concentrations (Na, Ca and Mg) and Sodium Adsorption Ratio (SAR). Then the results were statistically analyzed to find the correlation between water quality parameters and pumping duration.

Correlation study revealed that EC ($r = 0.317$, $p < 0.05$) and TDS ($r = 0.308$, $p < 0.05$) of irrigation water showed significant positive correlation whereas, sodium ($r = 0.087$, $p > 0.05$), magnesium ($r = 0.106$, $p > 0.05$) and sodium adsorption ratio ($r = 0.090$, $p > 0.05$) of irrigation water showed non-significant positive correlation with pumping duration. Calcium ($r = -0.083$, $p > 0.05$) and pH ($r = -0.074$, $p > 0.05$) showed non-significant negative correlation with duration of pumping. Further, this study reveals that, EC and TDS concentrations are increasing with the pumping duration in study site and it will affect the crop yield by deteriorating the soil in long run. Therefore, proper management practices such as improve the drainage, intermittent irrigation practices and the use of drip irrigation method might be the solutions for the existing water quality problem in the study area.

Key words: Electrical Conductivity, Ground Water, Pumping, Saltwater Intrusion.

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