

## **Groundwater resources and sea water intrusion in Kwale District**

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### **Abstract**

This work describes the results of water quality analysis carried out along the coastal plains of Kwale District, Kenya, to determine the influence of sea water intrusion, the relationship between tidal changes and water quality in boreholes close to the sea shore, and the effectiveness of the pumps in the provision of potable water in the study area. Four types of water were found in the study area; calcium bicarbonates, sodium bicarbonate, sodium chloride and calcium chloride water. Total dissolved solids (TDS) in sodium-rich waters varied from 800 ppm to 10,000ppm with most of the TDS concentrations being below 1000 ppm (recommended concentration limits for drinking water). The salinity hazards for the water are greater than 750  $\mu$  s/cm at 25 degree C. Consequently this water has limited practical use. A salt tongue (sea water intrusion) was detected covering a distance ranging from 1.5 to 6.5 km from the shoreline in Mwabungo-Waa area. But in the Msambweni area, sea water intrusion is still limited and waters are safe for drinking up to the shoreline except adjacent to Msambweni hospital and South Kigwede in the Shirazi area. During periods of high tide some wells exhibit higher levels of water and higher salinity than during the time of low tides. This effect decreases with distance away from the seashore.