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Assessment of the extent of salt water intrusion and vulnerability of freshwater aquifers at Koggala lagoon area

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Groundwater is very important and is the only source of fresh water in the coastal belt of Sri Lanka, especially in the sand stretches located between brackish water lagoons and the sea. Therefore this study was conducted to assess the extent of the saltwater intrusion in the Koggala lagoon area, Galle District,Southern Province in Sri Lanka. The objectives of the research were to investigate salt affected area at Koggala lagoon and assess the vulnerability of fresh water aquifers at Koggala area to salt water intrusion.

Electrical conductivity values (at three different depths, *viz*., surface, middle and bottom) of 57 selected dug wells located within 700m from the Lagoon bank were measured during the study period from March 2017 to August 2017. Further, undisturbed soil samples collected at the lagoon bank were analyzed for hydraulic conductivity and for particle size analysis.

It was noted that salinity levels and electrical conductivity fluctuateconsiderably with high rainfall. During the study average EC levels of dug wells drastically decreased in June due to comparatively high rainfall and dilution. Electrical conductivity values of many wells in the seaside were above the desirable level of 750 µS/cm, stipulated in Sri Lankan drinking water quality standards of SLS 614(1983), while other wells in the seaside have exceeded the permissible level of 3500µS/cm in the dry months, March and April. However, all the dug wells located on the inland side have not exceeded the maximum permissible level of EC during the study period.

This study reveals that there is significant correlation between EC values of the dug wells and distance from the lagoon bank while the wells located beside the lagoon mouth, in between sea and the lagoon have comparatively higher EC values due to salt water intrusion.

Key Words:Salt water intrusion, Fresh water acquirers, Vulnerability, Koggala lagoon area, Electrical conductivity.

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