



Hydrogeophysical investigations to assess the carrying capacity of the fresh groundwater resources in the Kalpitiya Peninsula, Sri Lanka

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Recent developments of the rural areas in Sri Lanka and other parts of the third world have resulted in an increased exploitation of the natural resources. On the Kalpitiya Peninsula on the North West coast of Sri Lanka, extremely high values of nitrate and other chemical pollutants have recently been measured in the primary aquifer originating from intensive agriculture. The extensive pumping of the shallow aquifer for irrigation has increased the risk of pumping up saltwater from deeper layers, deteriorating the groundwater quality even further.

In this study we investigate the hydrogeological conditions along a profile across the Southern part of the Kalpitiya Peninsula to estimate the carrying capacity of the freshwater aquifer. In order to map the distribution of clay lenses/layers and the fresh-saltwater interface we integrate collected Multi Electrode Profiling (MEP) data with geological logs obtained from three boreholes located along the profile line. We conduct resolution tests base on synthetic data to determine ambiguities and resolution of the inverted electrical profile.

The geophysical findings are used to construct a hydrological model along the transect. The ultimate goal of the project is to estimate future impacts of increased agricultural activity or climatic changes on the freshwater resource in the area.