

## Water Quality Distribution in Tsunami Affected Areas using GIS (in Weligama- Sri Lanka)

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### ABSTRACT

Sri Lanka was hit its worst ever natural disaster and national tragedy on December 26, 2004, and shallow groundwater wells was completely damage. The study was conducted in Weligama coastal belt from May 2005 to May 2006 to identify scale of groundwater pollution due to tsunami. The network of ninety dug wells distributed over both the affected and non affected tsunami area was selected and location of the wells was detected with a GPS. Continuous monitoring of the water levels in the wells was conducted with respect to electrical conductivity (EC), total dissolved solids, salinity and pH. GIS package MAPINFOR was applied to plot the hydro-geological map and quality distribution maps. After one year and six months, EC values are still high and depend on the hydrogeological condition, elevation, topography and etc. The results of the study revealed that the electrical conductivity (EC) of groundwater quality situated in the Tsunami-affected region have EC values, on average, 1500- 3000  $\mu$  Siemens/cm.

### INTRODUCTION

Coastal resources exist in environments comprising complex dynamic geomorphological and ecological systems that are extremely sensitive to misuse by man. Sri Lanka was hit its worst ever natural disaster and national tragedy on December 26, 2004, when a horrific tsunami ravaged the island's coastal region, leading to tremendous destruction on coastal environment (ADB, 2005; Domroes, 2006).

The water supply for domestic purposes was affected through the breach of water distribution pipe lines and through the filling of wells with debris and saltwater. Shallow groundwater wells have traditionally provided the main domestic water source in the coastal areas of Sri Lanka. In coastal region of Sri Lanka, groundwater has generally being considered to be a readily available, good quality source of water for drinking and for agricultural and industrial uses. However, with the increase of water demands, significant changes in land use patterns and a vast increase in the quantities and types of industrial, agricultural and domestic effluents entering the hydrological cycle, create a stress on groundwater.

The groundwater studies are auxiliary important in tsunami affected areas and serve as information on the inter-relation between surface and groundwater or between the water of different aquifers, condition of natural water recharge and



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under the influence of natural and artificial  
of long-term observations of the groundwater  
are available, the groundwater recharge value  
and analyzing these regime observation data  
(Kiimentov.P.P, Kononov. V.M; 1973).

The main objectives of the present research study are to: evaluate the groundwater regime and identify groundwater quality distribution after the tsunami in the southern coastal area.