

MAPPING OF GROUNDWATER QUALITY IN CHUNNAKAM AND JAFFNA TOWN: WATER QUALITY INDEX AND GIS

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Jaffna peninsula is dependent on groundwater resources for all its needs. The quality of groundwater has been progressively declining largely due to sea water intrusion - salinity development and inorganic agricultural inputs such as fertilizer and pesticides. The suitability of groundwater for human consumption is a need through mapping and assessment of its physical, chemical and biological characteristics.

The Water Quality Index (WQI) is a simple tool to convey water quality information to planners, policy makers and the public. A compound indicator aggregates information from several water quality parameters. For this study, Chunnakam was sampled to represent a predominantly agricultural area and the Jaffna town representing a residential area. Secondary groundwater quality parameters data were used for which twenty dug wells were chosen in each site. This study aims at mapping of Water Quality Parameters and WQI in the sampled groundwater. This study data was undertaken within a period of five months from December 2010 to April 2011. Nine critical parameters such as pH, turbidity, total alkalinity, total hardness, phosphate, chlorides, nitrate-N, total coliforms and sulphate were determined to assess WQI.

The WQI for the dug wells ranged from 1.2 to 75.5 with an average value of 11.8 ± 6.3 . The spatial distribution map for nitrate was high in the Chunnakam area due to intensive agriculture. The site map for Jaffna town showed high level of alkalinity, pH, chloride, EC, total hardness and sulphate due to very shallow well quickly recharged by rain and there closeness to the sea coast. The WQI value increased in December 2010 and the quality declined because of the recharge by rain. The WQI map in January 2011 is below 'fair' and the WQI for the rest of the study period shows below 'good' levels.

This study suggests that educating the public to adopt simple household treatment methods such as boiling and / or filtration during the rainy season will be a good hygienic practice due to high WQI. The methodology could be used to express the groundwater quality in water scarcity area to find out area with good quality water.