



Short Communication

Analysis of Water Quality Based on Total Dissolved Solids Along the Coastal Area of Kanyakumari, Tamil Nadu

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ABSTRACT

To ascertain the suitability of groundwaters for any purpose, it is essential to classify them depending upon their hydrochemical properties based on their TDS values. The groundwater of the area is freshwater except a few samples representing brackish water at Manakudi. Most of the groundwater samples are within the maximum permissible limit for drinking as per the WHO international standards. At the junction point, where Palayar and sea joins, the Echori effect was also studied and there is no such effect which affect the surface and groundwater properties. The TDS value of 2/3rd of the basin is below 500 mg/L indicating low content of chloride in groundwaters which can be used for drinking without any risk.

The quality of groundwater depends on various chemical constituents and their concentration, which is mostly derived from the geological strata of the particular region. A study area of 70 km long and 5 km width was taken into consideration for study after Tsunami along the Kanyakumari to Colachel coastal belt. The TDS values were determined as per APHA (1989). Good quality water with TDS values less than 500 mg/L containing less chloride is occurring in most parts of the study area. The groundwater in this area is of calcium bicarbonate/calcium chloride type. Based on TDS values, the groundwater in this area can be classified as suitable for both irrigation and drinking purposes (Wilcox 1955, WHO 1970, 1983). The TDS values more than 2000 mg/L were observed on the eastern part of the district in some areas like Monday Market. Water in these areas are sodium chloride type. Water from these places are, however, used for agricultural purposes. Generally, in this district water quality based on TDS is very good and suitable for agriculture and drinking purposes (Fig. 1).

In order to analyse the variation of water quality from 1972-2007, data from Public Works Department of 172 representative wells along the Kanyakumari to Colachel coastal belt of 350 sq. km area were analysed. The data on TDS values are shown in Figs. 2 to 8.

In Agastheeswaram taluk, Kanyakumari, Agastheeswaram, Kovalam, Manakudi, Rajakkamangalam wells have been selected. The wells show a near maximum increase in trend of TDS value at the rate of 12.769/year. However, after Tsunami of December 26, 2004, as per the analysis of water parameters, TDS value varies between 500 mg/L and 600 mg/L. In Kalkulam Taluk, Colachel and Monday Market wells have been selected, which show an increase in trend of TDS value at the rate of 4.670/year. However, after Tsunami, TDS values varies from 400 mg/L to 500 mg/L. The results on conductivity basis after and before Tsunami in the wells are given in Table 1. A minor change has occurred in the quality of water after Tsunami.

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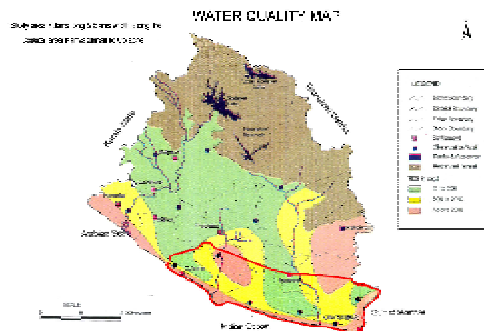


Fig. 1: Water quality map-Kanyakumari-Colachel coastal area.

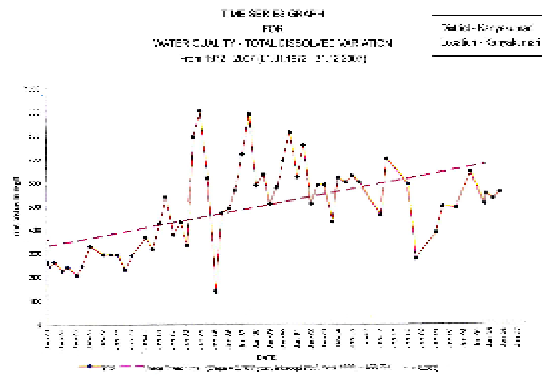


Fig. 2: Water quality- TDS-Kanyakumari.

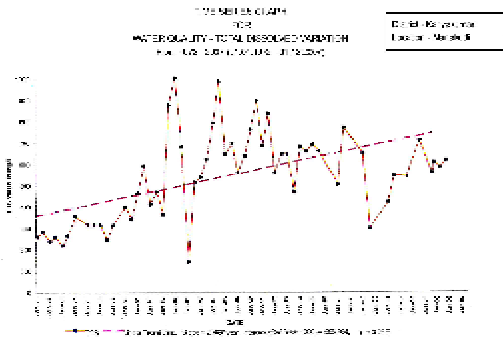


Fig. 3: Water quality-TDS-Agastheeswaram.

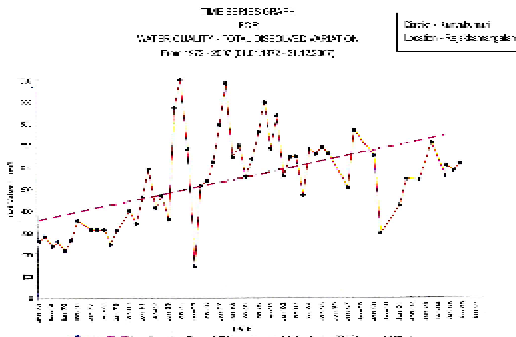


Fig. 4: Water quality -TDS-Kovalam.

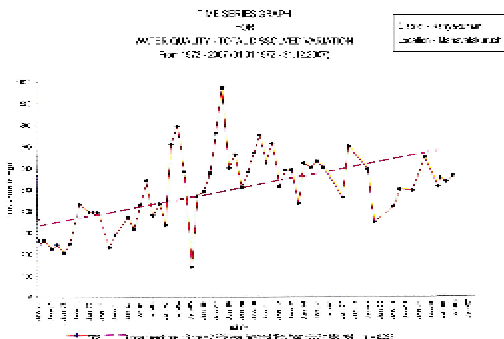


Fig. 5: Water quality-TDS-Manakudi.

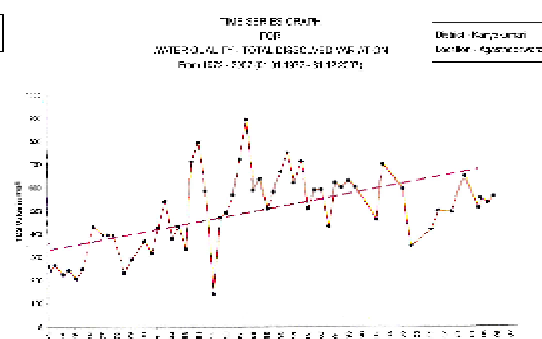


Fig. 6: Water quality-TDS-Rajakamankalam.

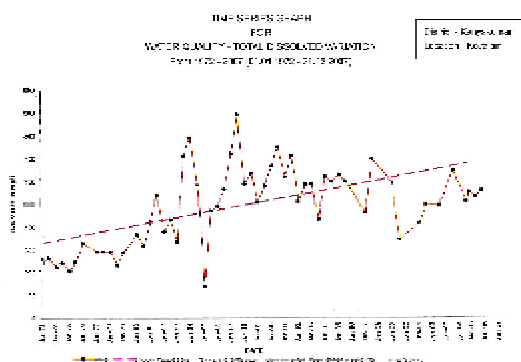


Fig. 7: Water quality-TDS-Manavalakuruchi.

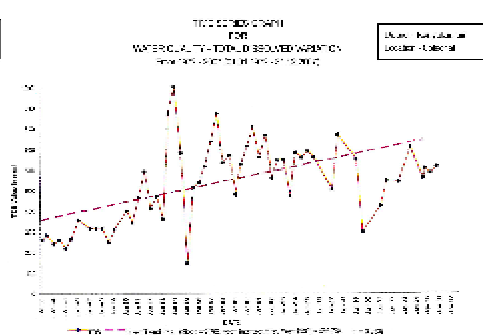


Fig. 8: Water quality-TDS-Colachel.

Table 1: Impact on quality of groundwater near sea coast affected by Tsunami on 26.12.2004 in Kanyakumari, South Tamilnadu, India.

S.No	Observation well No.	Location	Distance from sea shore	EC value as on 7/2004 micromhos/cm	EC value as on 29.12.2004 micromhos/cm
1.	93050	Colachal	1800m	1670	460
2.	A93019	Colachal (Municipal well)	700m	-	1080
3.	93052A	Manavalakurichi	1400m	Dry	Dry
4.	93053	Rajakkamanagalam	2500m	1040	900
5.	93055A	Mathusoothanapuram	5000m	480	1530
6.	93056A	Agastheeswaram	2700m	610	1560
7.	93043A	Kottaram	2800m	800	1510

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