

GROUNDWATER QUALITY ASSESSMENT AND HUMAN HEALTH IN THE SOUTH CHENNAI COASTAL AQUIFER, INDIA

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Coastal aquifer south of Chennai, India is bounded by salt/sewerage contaminated water on all four sides: the Bay of Bengal in the east, a canal in the west, and the Adyar river and Muttukadu estuary in the north and south, respectively. Environmental and ecological imbalance is arising in this area due to over exploitation of groundwater by private wells due to increase in settlements, hotels, tourism and industrial activities. Exploitation of groundwater is often not matched by rainfall recharge which promotes seawater intrusion. In the year 2002, the government brought an act that makes rainwater harvesting mandatory for all buildings in this area. The objective of this study is to determine the groundwater quality of this region. Groundwater samples were collected from 50 wells once in three months from August 2008 to May 2009. Groundwater level, Electrical conductivity, pH, ORP and temperature of samples were measured in-situ. The concentrations of major and minor ions were determined by titration and ion chromatography. Groundwater qualities based on the measured concentrations were compared with recommended drinking water limits based on the Bureau of Indian Standards and the World Health Organisation. Various thematic layers were prepared and an overlay analysis was carried out by using weighing method. Groundwater quality index map prepared indicate the influence of salinisation and anthropogenic activities in the northern part of the study area and marginal in southern part due to aquaculture activities.

Keywords: groundwater quality, Health impact assessment, overlay analysis, Chennai, India