

HYDROCHEMISTRY OF THE TERTIARY AQUIFERS OF KERALA, INDIA

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Abstract

Kerala has a coastal line of about 600 km. Older Tertiary beds overlain by laterites and recent alluvium represent the sedimentary formation of the coast. Numerous rivers, backwater channels and lakes dissect the coastal area. Two areas, namely Kuttanad and Kole lands, lie below mean sea level. As per the published literature prior to 1976, the Tertiary formation of Kerala is made up of two distinct beds known as Quilon beds and Warkali beds. The subsequent exploration carried out by Central Ground Water Board had confirmed the existence of two older beds underlying the Quilon beds, namely Vaikom and Alleppey beds. The Tertiary beds are overlain by laterites, which again are covered by recent alluvium. The Vaikom beds are seen all along the sedimentary basin, whereas the Quilon and Warkali beds are encountered only south of Cochin. Among the Tertiary beds, only Vaikom and Warkali form potential aquifers. The Vaikom is the most extensive aquifer and it contains fresh water south of Karuvatta in Alleppey district. Isolated pockets of fresh water are also seen north of Karuvatta (Udayanapuram, Vypin etc). The Warkali bed has fresh water south of Sherthalai of Alleppey district and west of Vembanad Lake. The source of salinity in the Tertiary aquifers was studied in details by the Central Ground Water Board and it was found that the salinity/brackishness is due to leaching of salts from the aquifer materials (insitu) and not due to sea water intrusion. The formation waters from the deeper confined Tertiary aquifers are high in bicarbonate and iron compared to the groundwater in the phreatic zone and higher incidence of fluoride is seen in and around Alleppey town in Alleppey district.

Keywords: Coastal hydrogeology, Hydrochemistry, Freshening, Sea level changes, Insitu salinity, Tertiary aquifers.