

◆ Research paper

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Groundwater Quality Assessment of Deltaic Aquifers of Indus Basin: A Case Study of Thatta District, Sindh, Pakistan

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Abstract: This study focuses on groundwater quality for public health in Thatta district that represents a very poor socioeconomic profile. The city has a very limited piped water supply where people mostly rely on well water. For this purpose, groundwater samples were collected from 21 different locations and water quality was assessed for physicochemical and biological analysis using standard methods. Groundwater wells are installed at variable depths (Range: 18 – 70ft). Aesthetically, about 67% samples showed saline taste and three samples are yellow in color or opacity with earthy smell. About half of total samples are turbid (0.03-93 NTU) where four samples (GH-1, GH-3, TH-5, TH-6) showed very high turbidity (5.31-93 NTU). The pH varied in a circum neutral range (6.7-7.4) which is within permissible range (6.5-8.5) of WHO set for drinking water. Conversely, Eh/ORP of all samples remained on lower side (28-120 mv) against WHO guideline range (300-500 mv). Similarly, objectionable hardness (600-2000 mg/L) is reported in all collected samples against WHO limit of 500 mg/L. Likewise, TDS content (567-1609 mg/L) of all and one third samples is above permissible limit of WHO (500 mg/L) and Pakistani guidelines (1000 mg/L) respectively. About half of the samples are reported to be sewage impacted as indicated by the occurrence of pathogenic bacteria. It is concluded that the groundwater is highly polluted due to domestic and agricultural discharge. The problem is further aggravated by poor sanitation conditions and seawater intrusion. None of the water samples met the water quality criteria set by WHO. The groundwater was found to be highly contaminated and possess serious human health risks. Effective measures are urgently required for water quality management in the city.

Keywords: Groundwater, Quality, Drinking, coastal aquifers, Indus delta, Thatta, Sindh.



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