

The Use of Isotopic Technique to the Assessment of River Recharge to the Depleted Ground Water Systems in Dhaka, Banglad

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Surveys of groundwater quality across Dhaka demonstrate the impact of intensive groundwater abstraction, which has led to invasion of the Dupi Tila aquifer by lower quality water in parts of the city. Groundwater chemical/isotopic monitoring is capable of discriminating between the effects of induced recharge from the polluted River Buriganga and of enhanced vertical leakage through the Madhupur Clay in contaminated urban areas. Over-exploitation of the aquifer has led to a progressive decline in water levels. The resulting cone of depression is thought likely to be causing the infiltration of polluted surface water. Stable isotopic techniques were used to characterize the hydrogeology and water sources the Dupi Tila aquifer beneath Dhaka. An interpretation of the linear $\delta^{18}\text{O}$ versus $\delta^2\text{H}$ relationship as a simple two-member mixing series between river water and recent meteoric recharge suggests that all groundwater in the lower Dupi Tila aquifer of Dhaka contains at least 30% river water.

Environmental isotope distributions approaches identify the polluted River Buriganga as the main threat to groundwater quality, indicating priorities for monitoring and aquifer protection.

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