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WORKING PAPER

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Evaluation for suitability of groundwater for irrigation and drinking purposes in the coastal region of Veraval, Gujarat

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Title: Evaluation for suitability of groundwater for irrigation and drinking purposes in the coastal region of Veraval, Gujarat

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Abstract (150 words): Worldwide, natural and human-caused intervention are influencing aquifer regeneration and ground water sustainability and production. Rapid urbanization, industrialization and excessive irrigation activities have intensified pressure on groundwater, depleting available supplies and degrading their quality. This study examines variations in the hydrochemistry of groundwater in the Veraval taluka of Gujarat's Junagadh Peninsula, using samples taken from 32 well sites. The aim of this report is to address the utilisation of water for drinking & irrigation applications. To determine the water's usefulness for the aforesaid applications, several hydro-chemical variables such as Total dissolved salts (TDS), Na⁺, pH, K⁺, SO₄²⁻, Ca²⁺, Cl⁻, Mg²⁺, HCO₃⁻ and their distributions are studied through spatial distribution plots generated using GIS mapping. The maximum of well samples are within the allowable maximum limit of BIS standards, but Chlorine, TDS, and Magnesium exceed the limit by 47.82%, 56.52%, and 69.56%, respectively. Water was analysed for a variety of direct and indirect applications using piper plots, ternary plots, multivariate analysis, and many other diagrams. The primary Water Quality Indices (WQIs) such as the Residual Sodium Carbonate (RSC), Sodium Absorption Ratio (SAR), Magnesium Hazard (MH), the Kelly Ratio (KR) and Salinity Hazard are examined for irrigational purpose. Veraval being on the coastal zone and surrounded by sea water, has high salinity and sodicity in their land and groundwater. Hence this water should be treated according to the requirement before utilisation as it could affect majorly on crops yield and human consumption. The findings of this research will aid end users in determining the appropriate water management procedures to perform prior to using the water for improving water quality for consumption and irrigation application in the study region.

Keywords: Ground Water, Irrigation, Peninsula, Veraval, Junagadh