

Sustainable Water Management: Ground Water Recharging

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Abstract: This paper presents a comprehensive study on artificial groundwater recharge techniques with a specific focus on their application in the Sangamner region of Ahmednagar district, Maharashtra, where declining groundwater levels and increasing salinity pose significant challenges to sustainable water management. The project follows a structured approach comprising three phases: research and analysis, design and development, and implementation with continuous monitoring. Various artificial recharge methods—including recharge wells, pit recharge, spreading basins, rainwater harvesting, percolation ponds, and the indigenous JalTara technique—are evaluated for their feasibility and effectiveness in recharging aquifers. Detailed physico-chemical analysis of groundwater samples before and after the monsoon highlights fluctuations in water quality parameters such as pH, EC, TDS, nitrates, and total hardness, revealing spatial and seasonal variability. The JalTara method, in particular, demonstrates a scalable, low-cost, and farmer-friendly solution with the potential to improve agricultural productivity, reduce waterlogging, and enhance groundwater levels. This study emphasizes the need for integrated water resource management and localized recharge strategies to mitigate water scarcity, especially in semi-arid and agrarian regions affected by climate change and over-extraction.

Keywords: Artificial Groundwater Recharge, JalTara Technique, Water Quality Analysis, Sustainable Agriculture, Aquifer Management

