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A Novel Approach for Groundwater Budgeting Using GIS in a Part of Pondicherry Region, India

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Author(s)

Sivaraman Pethaperumal, Sabarathinam Chidambaram, Kandasamy Vijayaragavan, Mohan Viswanathan Prasanna, Kannan Anandavel, Ulaganathan Karmegam, Ramachandran Manivannan, Paluchamy Anandhan, Kesari Tirumalesh

ABSTRACT

The over extraction of groundwater from the coastal aquifers, result in reduction of groundwater resource and lowering of water level. In general, the depletion of groundwater level enhances the landward migration of saltwater wedge. Pondicherry is one such region with recent alluvium as the major formation. Since the study area forms a part of the coastal aquifer system this behaves as a fragile ecosystem. The present study has been attempted to calculate the extraction of water and to estimate the amount of recharge into this alluvial aquifer by using groundwater level variations. The monthly water level fluctuation was observed during the study period (2000-2002) in eighteen locations. The maximum rise in groundwater level observed during 2000 was considered as the initial water level for the study and the subsequent decline in water level (draw down) was monitored monthly until the rising trend was noted. This indicates the fall in water level due to extraction. Later keeping the deepest draw down as the initial value increasing water level trend was studied until there was a notice of decline in groundwater level. This indicates as the rise in water level due to recharge. This method of observation carried out at a single location was adopted for all eighteen locations. The spatial representation of these data for eighteen locations were carried out by using GIS and the area occupied by different groundwater level contours were calculated and the amount of water withdrawn/re- charged was estimated. The maximum recharge was noted in the central and the northern part of the study area when compared to the other regions. Similarly, the maximum discharge was noted in the northern and the southern part of the study area during the study period.

KEYWORDS

Water Level, Recharge, Groundwater Budget, GIS

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