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Statistical Method for Identification of Potential Groundwater Recharge Zone

Pallavi Banerjee and V.S. Singh
National Geophysical Research Institute (CSIR), Hyderabad, India (vns_pal@yahoo.co.in)

The effective development of groundwater resource is essential for a country like India. Artificial recharge is the planned, human activity of augmenting the amount of groundwater available through works designed to increase the natural replenishment or percolation of surface waters into the groundwater aquifers, resulting in a corresponding increase in the amount of groundwater available for
abstraction. India receives good amount of average annual rainfall about 114 cm but most of it's part waste through runoff. The imbalance between rainfall and recharge has caused serious shortage of water for drinking, agriculture and industrial purposes. The over exploitation of groundwater due to increasing population is an additional cause of water crisis that resulting in reduction in per capita availability of water in the country. Thus the planning for effective development of groundwater is essential through artificial recharge. Objective of the paper is to identification of artificial recharge zones by arresting runoff through suitable sites to restore groundwater conditions using statistical technique. The water table variation follows a pattern similar to rainfall variation with time delay. The rainfall and its relationship with recharge is a very important process in a shallow aquifer system. Understanding of this process is of critical importance to management of groundwater resource in any terrain. Groundwater system in a top weathered regolith in a balastic terrain forms shallow aquifer is often classified into shallow water table category. In the present study an effort has been made to understand the suitable recharge zone with relation to rainfall and water level by using statistical analysis. Daily time series data of rainfall and borehole water level data are cross correlated to investigate variations in groundwater level response time during the months of monsoon. This measurement facilitate to demarcate favorable areas for Artificial Recharge.

KEYWORDS: Water level; Rainfall; Recharge; Statistical analysis; Cross correlation.