Depth to Gravel Layer Mapping to determine Potential Areas of Artificial Groundwater Recharge in Patan Area

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ABSTRACT

Groundwater has been extensively used in Kathmandu Valley through dug wells, ponds and dhunge dharas (stone spouts) since ancient period. Shallow groundwater was tapped through dug wells and dhunge dharas. Rapid urbanization and increasing demand have however put enormous stress on the traditional water supply system especially as current municipal water supply barely fulfills 25% of the demand. Even in those days, recharge ponds were made and water was brought from the valley rims through long canals to recharge the system.

Local geology and the geomorphologic factors influencing the infiltration and recharge rates. Points located on terraces have relatively higher infiltration rates than those located on low lands due to high water level in lowlands which rejects rainwater recharge. The areas around Jawalakhel, Gabahal, Kumaripati and Lagankhel in Patan show immense potential for rainwater recharge. As dug wells and shallow tube wells have higher recharge rates than the pits and infiltrometers due to their access directly to the aquifer horizons, dug wells would be good structures for recharging shallow groundwater even in places lies in Kalimati Formation. More than 50% of the study area is high recharge potential area which mostly covers in the Southern and Western part of the study area according to the geology, topography and infiltration rate of the region. The percentage of coarse material is about 90% at Lagankhel area especially Patan Hospital periphery and infiltration rate is 1.2 cm/min which is relatively higher than other study area. It is concluded that Lagankhel area is more feasible than others.

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ABBREVIATION

LSMC	Lalitpur Sub-Metropolitan City
DOHM	Department of Hydrology and Meterology
N S E W	North South East West
TU	Tribhuvan University
DMG	Department of Mines and Geology
BGR	Bundesanstalt fur Geowissenschaften und Rohsoffe
JICA	Japan International Cooperation Agency
NGS	National Geological Society
WHO	World Health Organization
NWSC	Nepal Water Supply Corporation
DOI	Department of Irrigation
CBS	Central Bureau Statistic
MLD	Million Liter Daily
SW	Well Graded Sand
GP	Poorly Graded Gravel