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Influence of anthropogenic activities and seasonal variation on groundwater quality of Kathmandu Valley using multivariate statistical analysis

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Abstract Increasing anthropogenic activities in Kathmandu, the main urban centre of Nepal, have mounted heavy stresses on groundwater quantity and quality. Changing climate reflected by significant annual variations in temperature and precipitation may further exacerbate the situation, which will have a direct impact on groundwater levels, reserves and quality. In this study, several water quality parameters were used as possible indicators to trace the impact of anthropogenic activities on the groundwater quality of Kathmandu using multivariate statistical analysis. Impact of climatic and seasonal variations on groundwater quality was also discussed. Compared to the dry season, groundwater sources sampled during the wet season were more contaminated. The reasons for higher contamination levels during the wet season were probably due to the high recharge resulting in a shallow water table, and supplemented by leakages from septic tanks, haphazard disposal of solid waste and sewage.

Key words multivariate statistical analysis; groundwater quality; anthropogenic activities; climate change; seasonal variation; Kathmandu, Nepal