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Analyzing faecal contamination of urban groundwater in Kathmandu Valley, Nepal

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Shallow groundwater is an important source of domestic water in the Kathmandu Valley. Previous studies have reported *E.coli* contamination in water samples from many public and domestic wells, in urban area of the valley. Every year, about 3000 deaths due to waterborne diseases are reported. Microbial pollution in the groundwater could probably be the reason behind the deaths. The objective of this study is to investigate faecal contamination source and its contribution in the groundwater of the Kathmandu Valley, Nepal

We collected groundwater samples from shallow tube wells and dug wells (depth: 2.8-21 m) and river water samples from main rivers in Jan.2009, Aug.2009, Aug.2009 and May.2011. Then, we measured *E.coli* concentration, water oxygen and hydrogen isotopes, nitrate nitrogen and oxygen isotopes, and other chemicals in the water samples.

Higher *E.coli* concentrations were detected in the river water and the dug well (unprotected well) samples compared to the tube well (protected well). The high *E.coli* in the river water samples reflected wastewater discharge to the river without treatment. The seasonal variation of the water oxygen isotope and chemical concentration for both the groundwater and the river water samples indicated that the interaction between river water and shallow groundwater is insignificant. Additionally, high delta 15N of nitrate in the high *E.coli* water samples indicated sewage as possible source of faecal contamination in the groundwater

Keywords: Groundwater, Faecal contamination, E.coli, Stable isotopes, Kathmandu valley