[JJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-HW Hydrology & Water Environment

## [A-HW26]Water Environment and Geology in Urban Areas

convener:Takeshi Hayashi(Faculty of Education and Human Studies, Akita University), Kei Nishida(Interdisciplinary Centre for River Basin Environment, Interdisciplinary Graduate School, University of Yamanashi), Hiroaki SUZUKI(日本工営株式会社 中央研究所, 共同) Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe) The scope of this session is to create an interdisciplinary forum on the most recent advances in water environment and environmental geology research in urban areas. Various kinds of studies concerning environmental issues on water and geology in urban areas (e.g. water balance, water cycle, water resource development and management, inundations, hydrogeology, pollution and remediation, geohazard, basic law on the water cycle) are welcome from academia, industry, and government as well as wider geographic diversity.

## [AHW26-P05]Analysis of Nitrogen Pollution of Ground water in Kathmandu Valley

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In the Kathmandu Valley, capital city of Nepal, building infrastructure for water supply and sewage systems is delayed while water demand is higher population is rapidly growing in urban area. Because of the insufficient water-related infrastructure, people highly depend on ground water for domestic and agricultural uses, more than half of water demand, despite the chronic nitrogen pollution in ground water. In this study, ground waters were sampled from shallow dug and tube wells (3-30m) and deep tube wells (80-335m) in the valley, and pollution pattern and sources were analysed by using water quality tracers. While Na<sup>+</sup> or Cl<sup>-</sup> concentrations in shallow wells were plotted along the linear line, Cl<sup>-</sup> was not detected in most of deep wells. Assuming Cl<sup>-</sup> is not supplied from geological sources in this region, shallow groundwater is possible to be influenced by infiltration from ground surface containing domestic waste water. Ammonium nitrogen was more frequently detected in deep wells than in shallow wells with 65% of exceeding rate for National Drinking Water Standard in Nepal (1.17mgN/L). The values of δ <sup>15</sup>N-NH₄ in deep well waters were in the range of 0 &ndash; 0.1&permil;, supposedly derived from the lacustrine sediment of Paleozoic Lake Kathmandu. On the other hand, the values for shallow dug wells and shallow tube wells were higher than those for deep wells and were in the range of 3.0 & ndash; 7.0‰ and 2.0 – 5.0‰, respectively, implying the mixing of anthropogenic domestic or livestock waste waters and the natural lacustrine sediment. Nitrate nitrogen was not detected in most of deep wells and, in shallow wells, the exceeding rate for NDWS (11.3mgN/L) was lower than 20%. The δ<sup>15</sup>N-NO<sub>3</sub> in shallow dug well waters and shallow tube well waters were obviously higher than those of and were in the range of 9.0 – 22.0‰ and 15.0 – 23.0‰, respectively, The higher values of NO<sub>3</sub>-N than NH<sub>4</sub>-N can be partially caused by fractionation through denitrification and more possibly caused by mixing of anthropogenic sources. The results from this study indicate that, for resolving the nitrogen pollution of ground water, identification of the sources and fate is highly necessary in this region.