

AHW023-06

Room:102

Time:May 25 10:15-10:30

## Analysis of indicator bacteria presence affected by hydrologic factors in groundwater of Kathmandu Valley, Nepal

Kei Nishida<sup>1\*</sup>, NAKAMURA Takashi<sup>1</sup>, OSAKA Ken'ichi<sup>2</sup>, HARAMOTO Eiji<sup>1</sup>, TANAKA Yasuhiro<sup>3</sup>

<sup>1</sup>ICRE, The Univ. of Yamanashi, <sup>2</sup>The Univ. of Shiga Prefecture, <sup>3</sup>The Univ. of Yamanashi

Microbial contamination routinely causes water-borne diseases in Kathmandu Valley, Nepal (WHO 2007), nevertheless, qualitative & quantitative data still remains insufficient in the central area of the valley (Joshi 2003, Pradhan 2004, Prasai 2007, Warner 2007). The present study aims (i) to survey distribution of faecal indicator bacteria in wells and track the sources and (ii) to identify the microbial community structure for development of water quality assessment & control. 12 deep tube wells, 36 shallow tube wells and dug wells, river and rain waters were investigated during dry and wet seasons of 2008-2010. *E. coli* was detected from most of all wells. River waters showed extremely high levels, however, no clear relation was observed between *E. coli* conc. in any type of GW and distance of wells from adjacent rivers. According to stable isotope analyses, nitrate in river & dug wells probably originated from sewerage. These findings indicate that tube wells were rather protected and dug wells were most vulnerable for faecal contamination at very local scale. Genetic analysis of bacterial communities for deep well samples showed the existence of *Enterobacter*, *Acinetobacter* as well as methane & iron-metabolizing groups which provide information of alternative indicators for understanding the pollution system and controlling groundwater quality in the valley.

Keywords: groundwater, Kathmandu, Nepal, indicator bacteria, stable isotope ratio, hydrologic factor, *Escherichia coli*