

AHW023-P05

Room:Convention Hall

Time:May 25 16:15-18:45

Stable isotopic composition of rainwater and soil water of Kathmandu Valley, Nepal

Sujan Shrestha^{1*}, Sangam Shrestha², Takashi Nakamura³, Futaba Kazama³

¹University of Yamanashi, Japan, ²Asian Institute of Technology, Thailand, ³ICRE, University of Yamanashi, Japan

The present study examined the hydrogen and oxygen stable isotopic composition of rainwater and soil water and of Kathmandu Valley, Nepal. Ten stations were selected for rainwater sampling and two sites were selected for soil water samplings. Bulk rainwater samples were collected in biweekly basis whereas soil water samples were collected in a weekly basis during monsoon season (June - September) of 2010. Soil water samples were collected from 4 different depths (50, 70, 120 and 150cm) using tension lysimeter. Both the rainwater samples and soil water samples were analyzed water oxygen and hydrogen isotope values using Cavity Ring-Down Spectroscopy (Picarro, L1102-1).

The preliminary results of stable isotopic composition are used to construct the Local Meteoric Water Line (LMWL), and found to be $\delta D \text{ (permil)} = 8.17 \delta^{18}O + 10.8$ ($r^2 = 0.98$). This meteoric line was then compared with the Global Meteoric Water Line (GMWL), where the slope and intercept of LMWL are close to that of GMWL (i.e. $\delta D \text{ (permil)} = 8\delta^{18}O + 10$) as described by Craig (1961).

The isotopic composition of soil water varies according the depth of soil. In upper surface (50cm and 70cm depth), most of the soil water samples contain lighter $\delta^{18}O$ composition where the heavier values are observed in the greater depth (120 and 150cm). However some of the samples showed the similar isotopic composition of in all depths.

The variations and differences in isotopic composition of rainwater and soil water of Kathmandu Valley could provide the estimates of evaporation, infiltration processes which are very useful for the groundwater management perspective.

Reference

Craig (1961)

Keywords: rainwater, soil water, stable isotopes, Kathmandu