

CERAMAH TEKNIK TECHNICAL TALK

Groundwater and surface water interaction revealed by multi-tracer method in Klang River watershed, Malaysia

Saito Mariko
University of Tsukuba, Japan
Date: 6 March 2024
Venue: Webex and Facebook Live

The above talk was delivered by Dr. Saito Mariko on 6th March 2024 via Webex and Facebook Live of Faculty Science and Technology UKM. The total attendees were 137 persons.

Below is the synopsis of the presentation:

We investigate the groundwater flow system in the Klang River watershed, Malaysia, which has high precipitation and large topographic gradients, using multi-tracer methods such as dissolved ion constituents and stable isotope components of hydrogen and oxygen ($\delta^2\text{H}$ and $\delta^{18}\text{O}$). We conducted five sampling campaigns between September 2019 and December 2022, collecting 44 river water and 34 groundwater samples from upstream to downstream of the watershed. Water samples were analyzed in the laboratory for dissolved ion constituents, $\delta^2\text{H}$ and $\delta^{18}\text{O}$. In addition, existing data on the $\delta^{18}\text{O}$ of the precipitation in the downstream area and the hydraulic head of the groundwater were collected. As a result, the $\delta^{18}\text{O}$ of the river water at the headwaters and that of the deeper groundwater downstream ranged between -8.3‰ to -7.9‰ and -8.1‰ to -7.6‰ , respectively, suggesting that the deeper groundwater downstream recharged at the headwaters. The $\delta^{18}\text{O}$ in the mainstem of the Klang River decreased from -7.2‰ to -7.6‰ as the river flowed from the midstream to the downstream, which is lower than the precipitation weighted average of -7.2‰ in the downstream. The hydraulic head of deep groundwater is higher than that of shallow groundwater downstream, indicating that the direction of groundwater flow is upward. These results suggest that deep groundwater recharged in the headwaters, which is composed of low $\delta^{18}\text{O}$, is discharged to the downstream river with high flux. Thus, our study demonstrates the importance of the groundwater discharge in downstream river under conditions of high precipitation and large topographic gradients.

We would like to thank the invited speaker for the support to UKM and to the Geological Society of Malaysia.

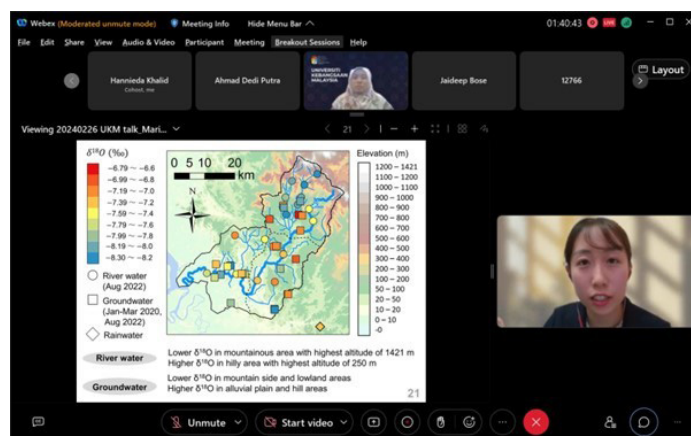


Figure 1: The invited speaker with the moderator and some of the participants that attended the session.

Prepared by,
Dr. Norsyafina Roslan
Moderator of Technical Talk (UKM)
12th March 2024