

Water quality status of selected rivers in Kota Marudu, Sabah, Malaysia and its suitability for usage

ABSTRACT

The water chemistry of selected rivers in Kota Marudu, Sabah was studied based on the major ion chemistry and its suitability for drinking and irrigation purposes. Ten sampling stations were selected and water samples were collected from each station to assess its chemical properties. The physico-chemical variables including temperature, electrical conductivity (EC), total dissolved solids (TDS), salinity, dissolved oxygen (DO), pH, turbidity, ammoniacal-nitrogen (NH₃-N), biological oxygen demand (BOD), chemical oxygen demand (COD) and total suspended solid (TSS) were measured. The cations (K, Mg, Ca, Na) were analyzed by ICP-MS. Most of the variables were within the drinking water quality standards stipulated by the World Health Organization (WHO) and the Ministry of Health (MOH), Malaysia except for turbidity. Sodium adsorption ratio (SAR) and salinity hazard were calculated to identify the suitability of the water as irrigation water. The Wilcox diagram classifies that only 10% of samples are not suitable for the purpose of irrigation. The overall results showed that most of the rivers in Kota Marudu are still in a clean condition and suitable for drinking and irrigation purposes except for Sumbilingan River, which is considered as slightly polluted. The results are supported by the hierarchical cluster analysis as the stations were grouped into two groups; low and high pollution intensities. This preliminary result can update the baseline data of selected water quality parameters in the Kota Marudu and could serve as tool for assisting relevant government bodies in regulating the water resources policies in the future.

Keyword: Guideline; Hydrochemistry variation; Kota Marudu; Water quality