Drinking water quality assessment for geochemical and microbial parameters in Nowshera District, Khyber Pakhtunkhwa, Pakistan; In an aspect of Geo-ethical Consideration

Muhammad Naveed, Muhammad Yaseen, Saba Shaheen, and Said Muhammad
University of Peshawar, Department of Geology, Department of Geology, Peshawar, Pakistan (naveed_geo@uop.edu.pk)

Abstract

This study investigated the physicochemical and microbial contamination in the drinking water of fifteen villages in the Nowshera District. For this purpose, water samples (n=165) were collected and analyzed for pH, alkalinity, total dissolved solids, anions: carbonate (CO$_3^{2-}$), bicarbonate (HCO$_3^-$), chloride (Cl), fluoride (F), nitrate (NO$_3^-)$ and sulphate (SO$_4^{2-}$), cations: sodium (Na), potassium (K), calcium (Ca), magnesium (Mg) and arsenic (As) and microbial parameters (total coliform, fecal coliform and E coliform). Results revealed higher F, NO$_3^-$ and Fecal coliform contaminations in drinking water of the study area that have surpassed 28%, 5% and 30% of sampling respectively. Higher level of these contaminants in drinking water could cause health hazards such as dental and skeletal fluorosis, joint pain, dysentery, diarrhea and various other water borne diseases among the inhabitants of the study area. Fluoride contamination in water could be attributed to the F containing carbonates rocks of Peshawar Basin. Higher NO$_3^-$ and Fecal coliform contaminations in water could be attributed to surface ongoing agriculture activities and animals wastes that have affected dominantly the shallow aquifers in the study area. The study, therefore, strongly recommends deep well boring and defluoridation of the drinking water in the study area.