HYDROCHEMICAL INVESTIGATION OF RIVER PUNJKORA AND ITS TRIBUTARIES USED FOR IRRIGATION IN LOWER DIR, KHYBER PAKHTUNKHWA, PAKISTAN

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Abstract

The water of River Punjkora and its tributaries is used for irrigation in Lower Dir. The growing of vegetables and crops is closely related to the presence of water. Irrigation with poor water quality adversely affects soil fertility and crop yields. This study focus on hydro chemical analysis such as pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Na, K, Ca, Mg, and Sodium Adsorption Ratio (SAR) to evaluate the suitability of irrigation water of River Punjkora and its tributaries. The analysis indicated that pH, EC, TDS, Na, K, Ca, Mg and SAR ranged between 6.95-7.43 (mean = 7.204), 103-149 (113.344) µS/cm, 54.6-78.4 (60.066) mg/L, 7.306-43.836 (14.208) mg/L, 1.924- 6.136 (3.862) mg/L, 0.05- 2.375 (1.069) mg/L 24.05- 26.95 (25.747) mg/L and 0.633- 3.224 (1.124) meq/L respectively for River Punjkora and 7.02-7.57 (mean = 7.339), 212-374 (267) µS/cm, 114-196 (141.667) mg/L, 14.274-34.528 (24.29844) mg/L, 1.716-6.006 (3.481) mg/L, 0.975-32.275 (10.422) mg/L, 10.275-19.4 (14.083) mg/L and 2.743- 1.859 (2.494) respectively for its tributaries. By comparing the hydro chemical contents with water quality guideline on crop productivity illustrated that pH of both River Punjkora and tributaries is normal. The EC and TDS are the two important aspects for measuring the salinity of irrigation water. The EC and TDS concentration showed that water of River Punjkora and its tributaries is non- saline and is suitable for irrigation purpose. The contents of major elements in irrigation water of River Punjkora and its tributaries were found in the safe limits showing no toxicity hazard. The SAR calculation of the irrigation water of River Punjkora and its tributaries indicated that the water is suitable for irrigation. The SAR values also showed that irrigation with both sources did not show soil dispersion and permeability.