ABSTRACT

Heavy metal concentrations in a water sample from Habbaniyah Lake (HL), Iraq (Cr, Cd, Ni, Fe, Co, Zn, Pb, and Cu). Thirty-three sites were chosen in the research area from October 2020 to April 2021 to evaluate emissions of heavy metals during two seasons (dry and wet). Spectrophotometer for atomic absorption was used to test heavy metal concentration (USA Phoenix-986). The findings of the study indicate that water levels were concentrated Cr>Ni >Fe>Co>Pb>Zn=Cd=Cu during the dry season and the wet season Cr>Fe>Pb>Co>Ni=Zn=Cd=Cu. HMPI and HMEI were both used to assess the level of water supply toxicity of heavy metals in the area of research. In Habbaniyah Lake water, several concentrations of heavy metals exceed the criteria for drinking and water life such as Co and Pb were exceed the allowed limits of WHO, CCME in the dry and wet seasons. The study area's human, agricultural and industrial activities and human population resulted in a rise in heavy element concentrations including Cr that surpassed the WHO, CCME, FAO, EPA, and IQS. The mean values of (Cd, Zn, and Cu) during dry and wet seasons were non-consistent in all stations. The average value of Ni was above water life limit during the dry season. The average values of CD, HMPI, and HMEI during the wet season were 20.8984, 57.8248 and 24.8977 and in the dry season were 17.3745, 61.8769, and 22.3747 respectively. Results indicate that HL is highly contaminated with HMs according to national and international guidelines, (CD), (HMPI) and (HMEI) indices pointed that HL water quality was bad. Principal component analysis (PCA) and cluster analysis (CA) were applied to estimate the pollution sources, results show that, pollution are originated from multiple sources, anthropogenic sources are major pollution sources while lithogenic is minor pollution sources, anthropogenic origin, which is mostly due to the wastewater point sources on Warrar stream