

ASSESSMENT OF HEAVY METALS CONTAMINATION LEVELS IN SURFACE SOIL IN BAQA'A AREA, JORDAN

Abstract

Baqa'a is a residential area located in Ain al-Basha District, Balqa Governorate in Jordan. The population is estimated at 68,816 according to the 2015. The aim of this study is to determine the level of contamination of heavy metals in soil and to indicate their potential sources of origin. Thirteen samples were collected and analyzed using granulometric analysis, pH, electrical conductivity (EC), Total dissolved solid (TDS), Inductive coupled plasma (ICP) and X-ray diffraction (XRD). Soil contamination was assessed using three indices including index of geoaccumulation (I_{geo}), a contamination factor (CF) and degree of contamination (Cdeg). Soil contamination assessment allows for the arrangement of the metals from the higher to lower mean content in the studied samples as follows: $Mn > Cr > V > Ni > Zn > Cu > Co > Pb > Cd$ compared to the average soil. The I_{geo} values indicated that the results reported uncontaminated soil ($I_{geo} \leq 0$ for Cu, Pb, V and Cd), uncontaminated to moderately contaminated soil ($0 < I_{geo} < 1$ for Co, Mn, Zn and Ni). The CF of the heavy metals of the studied samples indicating low contamination to considerable contamination for most of heavy metals. It can be concluded that the value of Cdeg for most of heavy metals in the tested samples indicated moderate to considerable degree of contamination. Exception from this conclusion was noticed in some sites for Cr and Ni that could be related to high contamination due to agricultural, industrial and dumping of waste.