

An Investigation into Pollution of Selected Heavy Metals of Surface Soils in Hamadan Province Using Pollution Index

M. Barzin¹, H. Kheirabadi^{2*} and M. Afyuni¹

(Received: June 21-2014 ; Accepted : Feb. 10-2015)

Abstract

Soil pollution and accumulation of heavy metals in soils and crops are the most important bioenvironmental problems that threaten the life of plants, animals and humans. This study was conducted to explore contamination of heavy metals in soils of Hamadan province. A total of 286 composite surface soil samples (0-20 cm) were collected throughout the province. After preparation of the samples, the total contents of Zn, Pb, Cu, and Ni in soil samples were extracted using HNO₃. Total contents of heavy metals were measured by ICP. Contamination factor results showed that most samples were moderately polluted and contamination factor for lead was highly polluted. Interpolated distribution map of contamination factors (CF) and pollution load index (PLI) of the heavy metals were prepared using GIS. The overlap of CF and PLI maps with geology and land use maps indicated that the concentrations of Ni, Pb, Zn, and Cu have been controlled by natural factors such as parent material, but agricultural activities according to excessive consumption of animal manure and chemical fertilizers can increase most of these elements in soil.

Keyword: Soil pollution, Heavy Metal, Contamination Factor, Hamadan Province.

1. Dept. of Soil Sci., Isfa. Univ. of Technol., Isfahan, Iran.

2. Dept. of Soil Sci., Shahid Bahonar Univ. of Kerman, Kerman, Iran.

*: Corresponding Author, Email: kheirabadi@ymail.com