

## EVALUATION OF HEAVY METAL POLLUTION IN SURFACE SOILS IN ZANJAN PROVINCE, IRAN

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### ABSTRACT

Increases of heavy metals in soils are harmful to the environment and human health. Heavy metals in soils originate from both natural and anthropogenic sources. Zanzan province in Iran due to industrial and mining activities is susceptible to increasing of heavy metals. This paper investigated heavy metals concentration in 296 composite soil samples in Zanzan Province. Enrichment Factor (EF) and Geoaccumulation Index (Igeo) calculated for each soil sample to determine the soil quality. EF results show low enrichment in heavy metals except Pb and Zn. Igeo calculated for each sample and results indicated that most samples have no pollution except for Pb, Zn, and Cu. For the understanding of pollution pattern in the study area, the spatial distribution of heavy metals based on EF values evaluated and location of pollutants were determined. Results showed main pollutants were located in central part and western part of this area where industrial stated and mines have activities related to heavy metal.

**Key words:** Soil Pollution, Heavy Metals, Enrichment Factor, Geoaccumulation Index, Zanzan