عنوان مقاله:

Spatial Distribution of Cadmium in Agricultural Soils of Eghlid County, South of Iran

محل انتشار:

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خلاصه مقاله:

Background & Aims of the Study: Heavy metal contamination of soils, due to improper consumption of materials, such as different agrochemicals and pesticides, has caused major concerns in previous decades. Eghlid county, in the south of Iran, represents an area with contaminated soil by heavy metal which is due to the long-term use of fertilizers in cultivation. In this regard, the present study aimed to examine the spatial distribution of cadmium (Cd) contamination of soil and the soil properties that affect the Cd concentration in soil using geostatistical methods. Materials and Methods: This study was performed on 100 randomly selected surface soil samples. Some of the physical and chemical properties of the samples were measured, including calcium carbonate, electrical conductivity (EC), pH, soil texture, and organic matter. Cadmium concentration in samples was measured through the aqua regia method using inductively coupled plasma optical emission spectrometry (ICP-OES). The spatial distribution and temporal variation of data were carried out using the Kriging interpolation method and geographic information systems. Results: According to the results of geostatistical analyses, the semi-variogram of Cd, calcium carbonate, pH, and EC in the studied area followed a linear model, while that of the organic matter followed an exponential pattern. Moreover, the mean value of Cd concentration in the studied area was 2.80 mg kg-1 which indicated that most of the area had a high concentration of Cd, according to the Kriging map. Furthermore, based on the spatial distribution pattern of the soil characteristics, the percentage of clay in the northern and central parts of the studied area was found to be more than the southeastern sections. Besides, pH and carbonate calcium rates were higher in the northeast and southeast regions. In addition, the northern part of the studied area contained higher rates of EC and organic matter. Conclusion: Based on the findings, it can be argued that human activities, such as the excessive use of fertilizers, have had a significant effect on the increase in Cd concentration in the studied area.

کلمات کلیدی:
Cadmium, Environmental pollution, Soil pollutants, Spatial distribution