

Assessment and Measurement of Heavy Metals Contamination in Sediments of Gandoman Wetland

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Abstract

Wetlands ecosystem is regarded as one of nature and tourism aspects. These ecosystems are of special ecological properties and unique biodiversity due to specific climate and ground conditions. Gandoman wetland is one of important wetlands and rich ecosystems in Chaharmahal and Bakhtiari. Not considering the wetland environmental conditions has caused some problems and challenges. One of problems can be mentioned as entering the agricultural wastewater into the wetland leading to the heavy metal contamination. Sediments are important as the most basic absorbent of contaminants. Thus, the current study has been conducted to measure such heavy metals as lead, cadmium, copper and zinc within sediments of wetland entrance and exit. 24 sediment samples have been taken from the entrance of Gavkosh and Ghale-Armani and exit of Ashkoft-Zoleikha in summer and fall in 2018. After specifying the amounts of elements in the sediments, in order to determine the contamination intensity, Muller Geoaccumulation Index was used and National Oceanic and Atmospheric Administration (NOAA), Interim Sediment Quality Guidelines (ISQGs) and Ontario Ministry of Environment Screening Level Guidelines (Canada environment standard) were applied to assess the limit of element contamination. Results of Muller Geoaccumulation Index indicated that the wetland sediments are in the moderate-high range of Cadmium but lead, copper and zinc are in the non-contaminated level. Results of sediment elements' mean comparisons indicated two indices of ISQGs and Canada environment standard showed the amount of Cadmium higher than the specified limit but other elements are not contaminated. Results of t-test confirmed the results of sediment quality standards indices.

Keywords: National Oceanic and Atmospheric Administration (NOAA), Interim Sediment Quality Guidelines (ISQGs), Ontario Ministry of Environment Screening Level Guidelines (Canada environment standard), heavy metals, sediment contamination.