



Quality Evaluation and Study of Ecological Toxicity of Heavy Metals in Shadegan Wetland

* Samar Mortazavi¹, Mohsen Tizhoosh², Zahra Cheraghi³

^{1,2,3} Department of Environmental Science, Faculty of Natural Resources and Environmental Science, Malayer University, Iran,

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ABSTRACT

Wetlands hold a principal position in storing food for primary producers, so they are not able to bear the pressure. The slightest disturbance, hence, may harm wetlands and cause detrimental effects. The present study aims at monitoring heavy metals and evaluation of the sediment quality index of Shadegan wetland in Iran. Thus, a sampling of surface sediments of the wetland was performed at ten stations with three replications; after the preparation of samples with aqua regia, the concentrations of heavy metals were measured by atomic absorption spectroscopy. The quantification of sediment pollution using the contamination factor, contamination degree, pollution load index, ecological risk assessment index, and ecological toxicity of heavy metals in the region were all carried out. The results of Cf and Cd showed that the degree of zinc and copper contamination is low; however, the degree of lead contamination is moderate. Moreover, the obtained PLI was less than 1 indicating a lack of sediments contamination with heavy metals. The RI was less than 150 indicating a low risk of contamination. In addition, comparing the concentrations of elements with National Oceanic and Atmospheric Administration and Sediment Quality Guidelines showed slightly toxic and non-toxic sediments, respectively. Finally, based on a mixture of effect range median, all sediment samples are placed in the first category with less than 12% toxicity probability.

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1. Introduction

Aquatic ecosystems, as one of the main environmental features, are a key supplier of food and a roof over aquatic organism's head; on the other hand, they are also large sources for a wide range of pollutants. Since these ecosystems withstand a high capacity for development, they are subject to more serious risk due to the pollutants. Domestic and industrial sewage discharges, the growth in urbanization,

and industrial activities in coastal areas are severe threats to the safety of the coastal environment and aquatic ecosystems. Among

*Corresponding Author:

Department of Environmental Science, Faculty of Natural Resources and Environmental Science, Malayer University, Iran,

E-mail address: mortazavi.s@gmail.com