

Determining the Amount of Contamination Caused By Heavy Metals in Water and Sediments of the Bahmanshir River

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Received date: 2016/07/15

Reception date: 2018/01/01

Abstract

This study, conducted in 2014, made attempts to determine and compare the amount of the heavy metals mercury, cadmium, lead, cobalt and vanadium in water and sediments of 5 stations of the Bahmanshir River in the middle months of summer and winter. This river has been an estuary area subject to the ebb and flow of the tide, hence rich in ecological and fishing value, and the main source of water supply for Abadan and Khorramshahr as well. Research studies have demonstrated that this ecosystem is at high risk in terms of heavy metals. Heavy metals were measured by atomic absorption and with the help of the Perkin Elmer 4100 machine. The data were analyzed by SPSS 17.00 and mean scores of the treatments were compared through One-Way ANOVA. The results showed the highest average of cadmium, lead, and cobalt in water at station No. 5, and there were mercury and vanadium at stations No. 1 and 4 respectively in summer. The study also displayed the highest levels of mercury, cadmium, lead, and cobalt in river sediments at station No. 1 and vanadium at station No. 2 in summer. The comparison of the obtained values through the standards indicated that these metals were higher than the standards. Also, the findings showed that the sediment levels of mercury, lead, cobalt, and vanadium in the river were higher in summer than winter. The reason for the increase of these metals in the summer is the presence of a small amount of water compared to the amount in the winter due to high evaporation and a decrease in the flow rate as well as an increase in the activity of many industrial units including petrochemical companies in this season. This increases the amount of contamination in the river as well. The transfer of water from the Karun headwaters, the return of drainage from agriculture and industry, and urban wastewater are the causes of pollution in this river. The sudden annual spillage of industrial liquid waste of the companies located at the beginning of the river and the increase in the use of chemical fertilizers and unauthorized fish farms are also a contributing factor to the interim contamination of the Karun River, hence ultimately entering the Bahmanshir River.

Keywords: Water Contamination, Heavy Metals, Sediments, Bahmanshir River.