Accepted Manuscript

Pathways of heavy metals contamination and associated human health risk in Ajay River Basin, India

Umesh Kumar Singh, Balwant Kumar

PII: S0045-6535(17)30122-4

DOI: 10.1016/j.chemosphere.2017.01.103

Reference: CHEM 18716

To appear in: *ECSN*

Received Date: 31 October 2016

Revised Date: 14 January 2017

Accepted Date: 20 January 2017

Please cite this article as: Singh, U.K., Kumar, B., Pathways of heavy metals contamination and associated human health risk in Ajay River Basin, India, *Chemosphere* (2017), doi: 10.1016/j.chemosphere.2017.01.103.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Research Paper

Title: Pathways of heavy metals contamination and associated human health risk in Ajay River Basin, India

Authors: Umesh Kumar Singh*and Balwant Kumar
Address: Integrated Science Education and Research Centre (ISERC), Institute of Science, Visva-Bharati, Santiniketan-731235, Birbhum, West Bengal, India
***Corresponding author
Email: umeshkumar.singh@visva-bharati.ac.in

Abstract

The sources of heavy metals and their loads in the Ajay River were investigated based on the seasonal and spatial variations. To identify variation and pathways of heavy metals, seventy-six water samples were estimated for two years at nineteen sampling sites. The multifaceted data were applied to evaluate statistical relation between variables and arithmetic calculation of the indices. Fickling plot suggested that the acidic pollutants do not affect the water quality because all samples lie within the neutral pH range. Further, OC showed significant relation with Fe, Mn, Ni and Co. Compositional analysis identified weathering of rocks, mobility of soil and sediment, atmospheric deposition and numerous anthropogenic inputs as major sources of heavy metals. The mean values of heavy metal pollution index (HPI) and pollution index (PI) were found above the critical index and strong loadings respectively due to higher values of Cd, Pb and Fe. Similarly, assessment of human risk revealed that the high load of Cd, Pb and Fe in water body could harm the population. Majority of the samples showed high concentration of heavy metals as compared to regulatory standard and background values, which suggests that the water is highly contaminated through numerous geogenic and anthropogenic sources.

Keywords: Heavy metals, Environmetric techniques, Exposure, Ajay River

Download English Version:

https://daneshyari.com/en/article/5747319

Download Persian Version:

https://daneshyari.com/article/5747319

Daneshyari.com