

The Impact of Small Scale Mining on Irrigation Water Quality in Asante Akim Central Municipality of Ghana

D. Nukpezah¹, F. Abdul Rahman² and S. S. Koranteng³

1, 2,3 Institute of Environment and Sanitation Studies, University of Ghana, P. O. Box LG 209, Legon, Accra, Ghana

Corresponding author; Email: dnukpezah@staff.ug.edu.gh

Abstract

Small scale mining is a major threat to water resources and agricultural activities in most mining communities across Ghana. This study investigated the effect of small scale mining on the quality of water for irrigation from some selected sites along a river and a reservoir which was used as a control. The physical and chemical parameters of the water samples were measured using standard methods for water quality analysis. The samples were acid digested and assayed using Atomic Absorption Spectrophotometry (AAS). The study revealed that several of the physico-chemical parameters (turbidity, pH, conductivity, TDS) and heavy metals such as Pb and Hg were significantly higher (5% level of significance) at the river sites compared to the reservoir. Whilst most of the parameters measured were within range of the Food and Agriculture Organisation (FAO) limit for irrigation water quality, Hg, Cd, K and turbidity levels were higher than FAO permissible limits for irrigation water. Hazard assessment based on the sodium adsorption ratio (SAR), US Salinity laboratory classification and the Wilcox diagram for irrigation water quality showed the water to be within acceptable salinity and sodium limits for irrigation. It is inferred from the findings that activities of small scale miners along the river affects the quality of the water. The high turbidity and detection of some level of heavy metals in the water should be a major concern to stakeholders in the Municipality as continuous influx of small scale miners in the area could increase heavy metal concentration beyond the acceptable thresholds