

Assessing the Occupational Risks associated with Artisanal and Small-Scale mining- A Case study in Asankrangwa and Kenyasi Areas in Ghana

N.A. Buadee¹, S.K.Y. Gawu², and G. Foli^{2*}

*Departments of ¹Materials and ²Geological Engineering, College of Engineering
Kwame Nkrumah University of Science and Technology, Kumasi, Ghana*

Corresponding Author: gordon.foli01@gmail.com

Abstract

This study assesses some environmental and safety impacts, causes of accidents and hazards associated with operations at 10 selected Artisanal and Small-scale Mining (ASM) sites in Asankrangwa and Kenyasi areas. The aim is to establish the extent of the environmental and safety impacts and the risks associated with the hazards at the ASM sites and suggest ways to minimise the impacts. Dust and noise monitoring results show that silica dust and noise levels are above the American Conference of Governmental Industrial Hygienist (ACGIH) of occupational exposure limits. Results from questionnaire administration indicate that low levels of risk awareness, use of personal protective equipment, workplace monitoring and incident reporting, are the main challenges associated with the ASM operations. Causes of accidents are in the decreasing order of Pit collapse, Blasting, Flooding, Suffocation and Others. Using a 5x5 risk matrix, initial risk assessment (IRA), based on existing site conditions and residual risk assessment (RRA), based on recommended controls were conducted on 7 hazard types. The IRA scored HIGH (11-17) to EXTREME (18-25) values while the RRA scored MEDIUM (6-10) to LOW (1-5) values which represent average risk drop of about 47%. Fifty percent of the study sites indicate HIGH fatality rates. The causes of incidents are in the reducing order of; Handling of explosives, Digging to expose the ore, Shaft sinking, Ore preparation and beneficiation, Underground mining, Working in a poorly consolidated environment and Tunnelling. Risk Assessment is thus established as a necessary requirement for ASM practice in Ghana.