SAFE GOLD MINE DEVELOPMENT AND MINING METHODS IN MIGORI COUNTY-KENYA

ABSTRACT

The study area lies in South Western Kenya; it borders Tanzania to the west and covers approximately 1969 square kilometers, with a total population of 563,033 persons. Gold mining has been an on-going activity in the county since independence, with artisanal gold mining being the most dominant type.

The area is covered by volcano-sedimentary sequences and intrusive rocks of the Migori Greenstone Belt, which is part of the Achaean Tanzanian craton. Gold is hosted in quartz veins and also it is associated with massive sulphides (pyrrhotite, pyrite, chalcopyrite, and galena).

The main objectives of this project is to investigate the environmental and health challenges, which arise due to current gold mine developments and mining methods and determine the procedures that are necessary to best mitigate the challenges. So as to achieve the objectives of the project, a field execution was carried at Carlos mines in Kehancha and Prancis mines in the Kuria-Transmara border, where data on mining methods, mine development, geology and mining challenges was collected in form of notes and photos. Secondary data (library research) was also used in explaining the sources and remedies to the challenges faced in mining.

The results obtained showed that the mining methods used in the area are both surface and underground. Surface mining involves both alluvial mining and mechanical mining such as open cast while underground mining involves supported and unsupported mining methods. The challenges that arise from mining are; acid nine drainage (AMD), air and noise pollution, heavy metals pollution, mine caving and mercury pollution. Some of the challenges like AMD, heavy metals pollution and mine caving are related to the local geology, while others such as noise and mercury pollution are not.

The mitigation to the above challenges include treatment of the AMD or prevention of its occurrence, limiting the amount of mercury released into the environment by involving relevant technologies, using of protective devices for control of both air and noise pollution effects and doing of continuous mine rehabilitation programs for purposes of restoring degraded land especially in exhausted mines. Mine caving can be minimized through the adoption of supported mining methods such as stull stopping and cut and fill, which generally makes the roofs of the mines stable, limited explosive usage can also reduce chances of mine caving.