

UDC 553.411.071

DANGERS ASSOCIATED WITH GOLD MINING

© Ofori Yeboah, Efimova E.A.

e-mail: oyeboah16@gmail.com

Samara National Research University, Samara, Russian Federation

Mineral resources contribute immensely to the development of almost every single country on our planet earth and gold is one of them. Gold is used as a medium of exchange for money, as in jewelry and many other uses but we cannot escape the dangers associated with the mining of this precious mineral, the dangers associated with gold mining around the world varies according to level of technology in that community. Most artisanal gold miners are from socially and economically marginalized communities, and turn to mining in order to escape extreme poverty, unemployment and landlessness. The dangers force miners to not only risk persecution by the government, but also mine shaft collapses, and toxic poisoning from the variety of chemicals unsafely used in processing. Despite the many dangers of this activity, artisanal mining operations continue to spread as the demand for metals increases and other livelihoods such as farming, are no longer economically viable. UNIDO estimates that mercury amalgamation from this kind of gold mining results in the release of an estimated 1000 tons of mercury per year, which constitutes about 30 per cent of the world's anthropogenic mercury emissions. It is estimated that there are between 10 and 15 million artisanal and small scale gold miners worldwide, including 4.5 million women and 600,000 children. According to the United Nations Industrial Development Organization (UNIDO), as much as 95 percent of all mercury used in artisanal gold mining is released into the environment, constituting a danger on all fronts – economic, environmental and human health. Ghana a small country on the western part of Africa the second largest producer of gold in Africa and 10th on the world list is not an exception from these dangers. Some of the dangers are as follows

- The use of acid;
- Destruction of the ecological system and
- Toxic waste

The use of acid. Dirty gold mining often leads to a persistent problem known as acid mine drainage. The problem results when underground rock disturbed by mining is newly exposed to air and water. Iron sulfides in the rock can react with oxygen to form sulfuric acid. Acidic water draining from mine sites can be 20 to 300 times more concentrated than acid rain, and it is toxic to living organisms. The dangers increase when this acidic water runs over rocks and strips out other embedded heavy metals. Rivers and streams can become contaminated with metals such as cadmium, arsenic, lead, and iron. Cadmium has been linked to liver disease, while arsenic can cause skin cancer and tumors. Lead poisoning can cause learning disabilities and impaired development in children. Iron is less dangerous, although it gives rivers and streams a slimy orange coating and the smell of rotten eggs. Once acid mine drainage starts, it is difficult to stop. Acidic waters flowing from abandoned mines can raise acidity levels and destroy aquatic life for generations.

Destruction of the ecological system. Gold mining boom is accelerating the destruction of the Amazon rainforest, a biologically diverse ecosystem that acts as a check on global warming. Artisanal, or small-scale, gold miners are tearing down the forest to access the rich gold deposits beneath. One study found that deforestation rates in the Madre de Dios region of the Peruvian Amazon have increased six-fold due to gold mining. Large-scale

mining operations, especially those using open-pit mining techniques, can result in significant deforestation through forest clearing and the construction of roads which open remote forest areas to transient settlers, land speculators, and small-scale miners. These settlers and miners are probably a greater threat to the tropical rainforest environment than one well-documented example is the conflict between the Yanomani Indians of Northern Brazil and Venezuela and garimpeiros—illegal Brazilian miners. Reports indicated that Yanomani populations have fallen significantly since the first incursion of miners in the 1980s.

Toxic waste. Modern industrial gold mining destroys landscapes and creates huge amounts of toxic waste. Due to the use of dirty practices such as open pit mining and cyanide heap leaching, mining companies generate about 20 tons of toxic waste for every 0.333-ounce gold ring. The waste, usually a gray liquid sludge, is laden with deadly cyanide and toxic heavy metals. Many gold mines dump their toxic waste directly into natural water bodies. The Lihir gold mine in Papua New Guinea dumps over 5 million tons of toxic waste into the Pacific Ocean each year, destroying corals and other ocean life. Toxic waste spills have had devastating consequences in Romania, China, Ghana, Russia, Peru, South Africa, and other countries. In 2014, a dam collapsed at the Mount Polley gold and copper mine in British Columbia, sending about 25 million cubic meters of cyanide-laden waste into nearby rivers and lakes enough to fill about 9,800 Olympic-sized swimming pools. The spill poisoned water supplies, killed fish, and harmed local tourism.

In Conclusion: Gold mining cannot be stopped because, of all the minerals mined from the Earth, none is more useful than gold. Its usefulness is derived from a diversity of special properties. Gold conducts electricity, does not tarnish, is very easy to work, can be drawn into wire, can be hammered into thin sheets, alloys with many other metals, can be melted and cast into highly detailed shapes, has a wonderful color and a brilliant luster. Gold is a memorable metal that occupies a special place in the human mind and it also contributes immensely to the development of countries, communities in the form of employment, infrastructural and many aspects of our lives as humans, therefore the industry players, scientists and governments must come together to find a solution to these dangers through researches and development high-tech equipment for gold mining which will help to reduce or eradicate these dangers associated with its mining and also educate miners who use traditional methods through workshops.

References

1. Gold Mining and the Environment [Electronic Resource]: <https://www.brilliantearth.com/gold-mining-environment/> (accessed 14 February, 2019).
2. Gold mining industry contributed over US\$171 billion to global economy according to World Gold Council [Electronic Resource]: <https://www.gold.org/news-and-events/press-releases/gold-mining-industry-contributed-over-us171-billion-global-economy> (accessed 14 February, 2019).
3. Environmental Impact of Mining in the Rainforest: [Electronic Resource]: <https://www.brilliantearth.com/gold-mining-environment/?fbclid=IwAR1Wm3LYIF131gnyl3OoRExoYokV5BCmjFyNpnP5YjfuFsjaMI7DITAYgEI> (accessed 14 February, 2019).
4. Blacksmith Institute [Electronic Resource]: <https://www.pureearth.org/artisanal-gold-mining-dangerous-pollution-problem> (accessed 14 February, 2019).