Environmental and Health Impact of Small-Scale Gold Mining Activities in Ibanda District of Uganda

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ABSTRACT: In the recent past, artisanal small-scale gold mining activities in Kicuzi Subcounty, Ibanda District, Uganda, have had a severe influence on the environment and people's health. The study investigated the environmental and health impacts of small-scale. The questionnaires of 156 respondents were given to the Ibanda District's surrounding areas. The findings demonstrated that p-value is substantially associated with perception and the surroundings (p < 0.0005). The finding also demonstrates that p-value is substantially connected with the environment and health (p< 0.0005). The findings revealed that diarrhoea, skin illness, and injuries are the most common ailments in the population. As can be observed from the results, 75% of health workers admit that the health system in this municipality is not equipped to deal with mining-related health issues.

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MSGM (miniature artisanal and gold mining) activities are often found in places with substantial mineral resources and low labor costs. The substantial impact of artisanal small-scale gold mining (ASGM) is related to job generation, foreign exchange gains, and the country's economic growth. ASGM provides assistance in locations where natural resources are being deposited and simple tools and appliances are being used. Many countries have turned to a variety of activities to exploit natural resources in order to achieve rapid economic development. Mining is one of the most profitable activities. As a result, mining is a significant economic endeavor with the potential to contribute to the development of the community that provides the resource (Allen, 2019; Arah, 2015; Arifin et al., 2015; Aboka et al., 2014 and Ayanbo et al., 2014). Mining has a wide range of environmental and health consequences. This has resulted from mining corporations' operating tactics, as well as their effects on the natural environment and people beings in the surrounding towns. The health benefits of mining activities often outweigh the earnings. Small producers, including authorized miners and craftspeople, have produced the majority of gold. Artisanal miner production numbers are common, considering that most contractors are unlicensed, and even those that are licensed learn to under-proclaim. As a result, the majority of gold mining is done in questionable ways (Awomeso et al., 2017; Basu et al., 2015). The Ugandan government recently included small-scale mining activities in the draft national mining and minerals policy. This strategy, along with the government's master plan, will serve as the foundation for mining legislation and regulations. The significant impact of small-scale mining activities will be greatly needed in light of this planned policy (Omara et al., 2019). Simba Mining Company has reopened the Kitaka Gold Mine in the Kasyoha-Kitomi
forest reserve in Ibanda District, which has been closed for more than 50 years (Eludoyin et al., 2017; Omara et al., 2019). Despite being mined on a modest scale, the finding of gold in the Ibanda District provides employment to thousands of locals. Since the creation of small-scale mining activities, the community has had three major impacts: rapid loss of farmland, water and soil pollution, and difficulties in managing mine wastes (Omara et al., 2019).

ASGMs are typically confronted with a variety of problems, including occupational, environmental, and social factors. The main environmental and health hazards associated with artisanal and small-scale gold (ASG) mining are elemental mercury emissions and cyanide toxicity, both of which have negative consequences for humans, animals, plants, and aquatic species (Nakazawa et al., 2016; Arah, 2015; Ministry of Health, 2014). At both local (mine sites) and broader scales, gold mining degrades forest functions and has a negative impact on biodiversity, protection, and economic values of the forest (forest surrounding the mining sites and construction of roads). In terms of better livelihoods and the prevalence of illnesses linked to mercury poisoning, the indigenous community benefits in a limited way from existing mining activities.

ASG miners are regularly subjected to hazardous health, safety, and living situations and they typically use ineffective and dangerous "prospecting and extraction" practices (Ministry of Health, 2014). In this industry, the use of mercury in gold processing has resulted in increasing occupational health and environmental dangers. Miniature gold mining has increased as a result of rising poverty and a persistent and continuous lack of rain. Farmers who have settled down have turned to ASM as a source of income, and they are collaborating with miners to facilitate mining on their land. ASM has been embraced as part of a coping master plan to mitigate the economy's negative effects, penury and lack of rain. Artisanal mining is probably more profitable than agriculture, gaining momentum in the past two decades (UBOS, 2017, Ministry of Health, 2014). Miniature gold mining leads employment generation, it is associated with ecological and health hazards. Artisanal small-scale gold mining has been acknowledged as one of the major pilots which are accountable for the demolition of the environment (Awomoso et al., 2017).

However, the environmental and health impacts of small-scale mining activities have not been carried out in Kicuzi Sub-county, Ibanda District. The objective of this work is to assess the environmental and health effects of artisanal small-scale mining activities in Kicuzi Sub-county, Ibanda District, Uganda.

**MATERIALS AND METHODS**

A survey questionnaire was distributed to 156 residents in the Division in order to meet the research objectives. The analysis was carried out using the Statistical Package for the Social Sciences and a qualitative approach (SPSS). Officials and employees of local health centers were also approached for pertinent information. Moreover, there field observations of the mine sites and other areas to determine the effects of mining operations on the environment. Background information about respondents, awareness, perception, and consequences of mining in the surrounding areas, health status of residents in the surrounding communities, food security, and the status of health facilities were all collected. This study included primary and secondary data collected through questionnaire administration, as well as literature, intent, and journals, among other sources.

**RESULTS AND DISCUSSION**

In this district's Ibanda settlements, both surface and underground mining were exploited. Both surface and subsurface mining, according to the respondents, have negative environmental consequences. Mining has been a major contributor to the destruction of land and vegetation in this area, as seen in Table 1. It also leads to pollution, such as water contamination, air pollution, and noise pollution, as seen in the table. Land degradation is one of the principal effects of surface mining, as illustrated in Table 1. The outcome is in line with Kessey and Arko's expectations (2013). Table 2 demonstrates that diarrhoea, skin illness, and injuries are the most common diseases in the community. Mining activities have resulted in fatalities, according to 75% of health personnel. The result is in agreement with Omara et al., 2019. Heavy machinery used to remove top soil, trees, and vegetation wears away the soil nutrients, rendering the ground unfit for farming. Table 4 reveals that the Ibanda District has the highest number of female miners (64.2 percent). In the Ibanda District, the percentage of respondents who had attended school was very high. The majority of the miners in this area have completed vocational and tertiary schooling. Table 4 shows that mining has been a key source of income in this municipality and has resulted in job possibilities for the educated. Farmers have benefited the most from mining activity (81), followed by business people (73). Child labor was more prevalent in ASGM sites that are more informal and where involvement is more voluntary.

**Table 1:** Extraction Methods and its Effect
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Mining activities have been blamed for land and vegetation degradation (66.4%). Since farming is directly negatively impacted by land and vegetation degradation with such a high percentage has undermined farming in this locality.

The study has emphasized policy applicability issues, such as the need for more awareness campaigns and programs for proper management of small-scale gold mining (ASGM) activities and effective regulations to enable spatial vegetation cutting without depletion in Ibanda District, based on the findings of these research studies. As a result, both government and non-governmental groups should make a concentrated effort to improve household perceptions and cognition approaches to environmental media interaction in the District through effective collaboration and coordination. It is highlighted that re-afforestation initiatives are required near and within the mine, since

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trees are taken down and replaced with new ones to ensure the future environment. To prevent mishaps, Simba Mining Company must offer safety equipment to its employees and implement safety precautions in hazardous areas. Similarly, more comprehensive mitigation measures for the negative impacts of mining on the environment and health of people living in and around Kitaka gold mines, Ibanda District, must be designed and implemented in collaboration between environmentalists and health workers. Future studies can be conducted on the effects of intervention measures adopted and implemented by mining companies and stakeholder organizations in the surrounding communities, and national environmental, health, and mining regulations are needed to generate effective policies in environmental management that can sustain the environment. The following are the contributions to the current body of knowledge based on the findings of this study: The effects of gold mining activities in the Ibanda District on environmental media interaction (i.e., soil, fill material, other geological materials, etc.) and the demographic features of gold miners in the Division are investigated. As a result, the effects of gold mining on vegetation loss in Ibanda Municipality as well as the health of miners in Ibanda communities have been determined.

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