Review Article

Review on Effects of Mining in Ghana; The case of Obuasi Municipality

ABSTRACT

The mining industry has been crucial to the development of Ghana. As with all industries, mining has both advantages and disadvantages for the inhabitants of mineral-rich communities. The manner in which these environmental and health effects are managed by the government, neighboring communities, and mining companies can either worsen or improve the quality of life for community residents. It appears that land degradation, environmental pollution, and numerous socioeconomic issues have been major concerns for Ghanaian communities practicing small-scale mining. The majority of these negative effects are the result of regulatory agencies' failure to adequately oversee the mining industry. This paper looks at the effects of mining in Ghana, especially in the Obuasi Municipality. It does this by looking at the history of mining in Ghana (Obuasi), the regulatory actors along the mining value chain, and some important lessons about mining.

Keywords:*Mining in Obuasi, mining industry, gold mining, social effect of mining, health effect of mining*

1.0 Introduction

Although mining, which is a key fiscal activity (Awudi, 2002), has the prospect of promoting wealth (Aryee, 2001) and, consequently, the development of mineral-endowed regions (Yeboah, 2008), the African Center for Economic Transformation(ACET) Synthesis Report in 2017 emphasizes that the opposite has been the experience for most resource-rich countries in Africa. The report asserts that the mineral-abundance of a land does not always translate into better lives for the people resulting in or as a result of boosted economies.

Ghana, a historic repository of a range of minerals, continues to experience challenges with the developmental impacts of its extractive resource activities despite the fact that, with respect to its gold production, it places second and tenth in Africa and globally, respectively (Agbesinyale, 2003).

Mining, however, remains a prominent influence in Ghana's economy (Agbesinyale, 2003), along with other fiscal activities such as oil and gas extraction, food processing, etc. (World Bank, 2019). The Institute of Statistical Social and Economic Research opines that the minerals and mining sector, in 2012, ranks higher than any other sector in the provision of foreign exchange by accounting for 38.96% of Ghana's total export earnings. Ghana's gold alone earns 95% of Ghana's natural resource income and 3.1% of the global gold reserves (Awudi, 2002).

The mineral-richness of Ghana, therefore, continues to attract many mining multinational companies (MNCs) (Akabzaa & Darimani, 2001) and has led to their proliferation on lands endowed with this natural resource (Ofosu-Mensah, 2012).

Obuasi, in the Adanse traditional area of the Ashanti Region, is one of such lands. Being one of the earliest mining areas in Ghana (Agbesinyale, 2003), and occupied by the largest MNC in Africa, AngloGold Ashanti Gold Mining Limited (AAGL), Obuasi has contributed immensely to Ghana's economic development for centuries (Tuokuu et al., 2019). Though Obuasi township is universally associated with gold-mining, Ofosu-Mensah (2012) asserts that its reputation is not only limited to the activity of gold-mining but also in the established huge quantities and quality of gold it produces. The economic pillar of the Municipal, therefore, is mining and its associated activities and it forms a part of AngloGold Ashanti's concession of about 200sq kmOfosu-Mensah, 2012).

Prior to the arrival of foreigners, much of the Adanse land was covered in dense and productive tropical forest (Ofosu-Mensah, 2012).These lands, which stretched wide and far, were used mainly for hunting, subsistence agricultural production, and cocoa plantations (Ofosu-Mensah, 2012).

However, with a rise in foreign mining investments in Ghana's mining lands such as Obuasi, following Ghana's Economic Recovery Programme (ERP), these land covers were drastically

affected as they had to make way for mining operations; Obuasi was not exempted in this pursuit (Mensah et al., 2020).

Therefore, from small indigenous mining operations into the situation and operation of an MNC which has continent-wide representation in gold-endowed lands, Obuasi (Adanse) has come a long way (Mensah et al., 2020; Barenblitt et al., 2021). Despite mining communities sometimes deriving some benefits from mining operations by these MNCs, Awudi (2002) argues that the tradeoff is generally more costly to these communities, and UNECA (2011) claims that the changes that occur as a result of mining make people living within and/or around mining communities like Obuasi more vulnerable to social, health, and environmental impacts (Agbesinyale, 2003;Yeboah, 2008; Mensah et al., 2020).

This paper seeks to review some impacts of mining in Ghana, focusing on the Obuasi Municipality, by reflecting on the history of mining in Ghana (Obuasi), the regulatory actors along the mining value chain and some key lessons on the concept of mining.

2.0 The main characteristics of the phenomenon of mining in Ghana

2.1 History of Mining in Ghana (Obuasi)

Back in the 7th century A.D., Arab traders were incentivized to explore Ghana because of its gold deposits (Worlanyo et al., 2022), as were the Portuguese in the 15th century (Ofosu-Mensah, 2012). They began their extraction activities, which were purposefully located along the coasts of this land, subsequently becoming known as the "Gold Coast". Many Europeans, such as the Danes, Dutch, Swedes, French, and British, who were also attracted by the Gold Coast's profitable reservoir of gold, arrived later on the coasts (Ofosu-Mensah, 2012;Tuokuu et al., 2019; Worlanyo et al., 2022).

In Obuasi, it is known that two Cape Coast Fante businessmen, Joseph E. Ellis and Joseph E. Biney, launched the contemporary history of the AGC in March 1890, when they laid claim to a 265-kilometer-square concession (Agbesinyale, 2003). A lucrative goldmine named the Ellis Mine was subsequently established, but with the need for more capital and expertise arising, the concession was transferred to Edwin Arthur Cade (Snapir et al., 2017). The concession which lay

between Bekwai and Adansi kingdoms was transferred on August 16th, 1895, in the presence of both chiefs (Ofosu-Mensah, 2012). The British Government at the time ratified the right of the company to the concession after the interim pact for the new mine, Cote d'Or Mining Firm, was contracted at Cape Coast. On June 11, 1897, approval for mining and its associated activities was given and AGC was registered with all possessions and responsibilities of the former company duly transferred to it. On that day, the company got listed on the London Stock Exchange (Szoke-Burke & Werker, 2021).

Prior to all this, by using the trans-Saharan trade routes to transport their minerals, the indigenous Obuasi people used shafts and pans to mine reefs and extract gold in the precolonial times, long before the arrival of the foreigners (Snapir et al., 2017). It was not until 1989 that the land, which hitherto was an underground mine, was exposed to surface mining activities. The local Obuasi folks handled this trade for a long time until colonization, which saw the British predominantly take over gold mining in the Gold Coast. AngloGold Ashanti (AGA), formed in 2004, was borne through a merger between Ghana-based AGC and AngloGold Company (Szoke-Burke & Werker, 2021). Prior to the merger, the AGC was a gold mining firm called The Ashanti Mine, which was situated in Obuasi, 56 kilometers south of Kumasi, and had been producing gold since 1897 (Wireko-Gyebi et al., 2022).

The State Mining Corporation, which the Ghana government created to supervise mining activities in the country, facilitated the 55% government majority-ownership of all mining operations, mainly by acquiring most mining companies, especially the British-owned ones. Artisanal and small-scale mining (ASM) has also been dominant in Ghana's mining sector as the large-scale MNCs, evidenced by 1,000,000 employed people in that sector and a projected 10,503 people formally engaged by the MNCs (Ghana Chamber of Mines, 2018).

2.2 Mining Regulations in Ghana

Using many institutions and agencies, the Ghana government employs many strategies, guidelines, procedures, rules and acts to govern its mining sector. Within these are established goals, principles, and standards that facilitate these mining activities while managing the various actors along the value chain. Ghana Chamber of Mines (2018) says that some of the most

important people are the people who work in the mining communities and the people who work in the civil and business sectors.

There are the customary laws that address the land tenure systems, as well as legislation that protects the environment, forests, water bodies, and water use (Wireko-Gyebi et al., 2022). But overall, the Ghana government exercises the Minerals Commission Act and Ghana's Constitution as the principal legislative instruments that govern mining on the land (Cobbinah & Amoako, 2018; Ghana Chamber of Mines, 2018).

The Minerals Development Fund Act (Act 192) 2016, gives the Ghana government proprietary rights over all un-earthed minerals, as well as a 10% interest in any mining operation that takes place on the land. It also details how mining operations get licensed in Ghana and how mining revenues are to be distributed along the value chain (Wireko-Gyebi et al., 2022).

The ASM operations, which also play a significant role in Ghana's mining sector, are supervised by the Precious Minerals and Marketing Corporation (PMMC) Law. It facilitates the operations of the ASM by providing marketing support for their output (Cobbinah & Amoako, 2018). Other auxiliary laws that support the Minerals and Mining Act are a set of General Regulations (LI 2173) and regulations that address mining support services (LI 2174). There are those that also address licensing (LI 2176), health and safety (LI 2182), compensation & resettlement (LI 2175), and explosives (LI 2177) (Ghana Chamber of Mines, 2018).

To oversee all these institutions that make policies and regulate the mining industry in Ghana, the Parliamentary Committee on Mines and Energy was set up to act as the main promotional and regulatory body for Ghana's mineral sector. The Minerals Commission acts together with the Ministry of Lands and Natural Resources to coordinate and implement mining policies with the Municipal and Metropolitan District Assemblies (MMDAs) (Ghana Chamber of Mines, 2018; Ofosu-Mensah, 2012).

As the Forestry Commission assesses the impact that mining may have on the forest and ecosystems, to recommend licensing or otherwise, the Environmental Protection Agency manages its environmental impacts. Other key government regulatory bodies that support the Minerals Commission include the Water Resources Commission (which creates water permits),

the Land Valuation Board (which determines the land value of a given concession), the Land Commission (which approves or disapproves new licenses) and the Geological Survey Department (Snapir et al., 2017).

Also, highly influential in the acquisition of all large-scale land for mining are the chieftaincy institutions and the traditional councils, which, on behalf of the communities they represent, hold an interest in land in their trust (Benshaul-Tolonen et al., 2019; Adu-Baffour et al., 2021). This notwithstanding, sometimes, out of the need to pursue the interest of the public, the government may acquire land using the law without the consent of the chieftaincy institution or the traditional council (Cobbinah & Amoako, 2018; Benshaul-Tolonen et al., 2019).

Other global mining initiatives that Ghana affiliates with include the Mineral Development Policy (EMDP), the 2011 Economic Community of West African States' (ECOWAS), the 2009 African Mining Vision (AMV), and the 2003 Extractives Industries Transparency Initiative (EITI) (Ofosu-Mensah, 2012). All these institutions, regulations, and associations ensure that Ghana complies with human rights and transparency codes and amplifies its strategies that channel its mineral resources for sustainable national development (Ghana Chamber of Mines, 2018).

3.0 A Theoretical Perspective on the Relationship Between Mining and Its Effects

There are basically two stances, perspectives, or assumptions from which one's reality about mining and its effects can be informed. Mining can be hypothesized as a double-edged sword with respect to its effects; positive or negative, good or bad. But whichever position one takes, its impact from the other perspective is almost impossible to overlook.

As Stewart (2020) mentions, the world's modes of transport and communication, as well as housing essentials, are all mining products in one way or another, without which our modern way of life would be unbearable. Again, community members have the opportunity to be gainfully employed due to mining (Mining Health Initiative, 2013), and the community as a whole benefits from infrastructural development with the situation and operation of mining operations, especially by MNCs (Adu-Baffour et al., 2021). All these, coupled with other

tangible positive mining outcomes, make it easy to posit mining as, indeed, essential and beneficial for and to mankind.

On the other hand, considering the other consequences of mining such as mental stress (Basu et al., 2015), physical ailments, social and cultural disorientation, and ecological ruins, one can say that mining is not beneficial but rather destructive to mankind and their survival. Perhaps mining can simply be viewed as a "necessary evil" (Mining Health Initiative, 2013; Basu et al., 2015).

4.0 Mining effects on the people of Ghana (Obuasi).

After the increase in mining sector investments following Ghana's ERP, mining became the chief earner of Ghana's foreign exchange (Adu-Baffour et al., 2021). Aside from giving the government a lot of money and giving the people wealth and public infrastructure (Wireko-Gyebi et al., 2022), it also created a lot of direct and indirect jobs and helped mining communities grow (Akabzaa & Darimani, 2001).

This notwithstanding, mining still leaves detrimental effects which are particularly significant to the inhabitants of areas in which or near which mining occurs (Stewart, 2020). For instance, Akabzaa and Darimani (2001) report that the environmental, social, economic, and health effects mining exerts on the inhabitants of Obuasi and those in its environs are the combined effects of its historic mining activities and the more recent extensive surface mining operations.

4.1 Environmental Issues of Gold Mining

Mahoney et al. (2015) validate the claim by many studies that intense and continued mining activities in a given region have resultant negative environmental consequences. Aram et al. (2021) highlight that the main factors that determine the severity of these environmental impacts include the technology used, the scope of extraction operations, and the project's site. The report, however, asserts that the environmental burden that mining operations exert far outweighs any benefits the community derives; and to further demonstrate the association between mining activities in Ghana and environmental complications, Mensah et al. (2022) recorded, among others, water and air pollution, biodiversity loss, and land degradation as some of the consequences.

In their study, Mensah et al. (2022) highlighted a direct correspondence between the rise in mining activities and massive environmental pollution. For instance, with the use of cyanide in industrial quantities at the AGA Obuasi mines, the gases released during the extraction processes are poisonous and destructive to human health (Yeboah, 2008). The people living within or near this site pay for these negative environmental costs in many dimensions of their lives. ActionAid(2006)reports that the vast amounts of water required and the installation of tailing dams to control ore-extraction run-off residues leave persistent poisons such as arsenic and cyanide acids (Ros–Tonen et al., 2021). These significantly impact the quality of water and its unstableness for all life forms within the region, essentially threatening the communities' everyday survival and economic capacities (Yeboah, 2008; Ros–Tonen et al., 2021).

Surface and underground mines that use explosives to blast rocks cause noise and vibrations in these communities (Yeboah, 2008), underscoring a very important source of pollution in this area. Again, in Obuasi and its environs, ActionAid (2006) reported high acidic levels in the water. These levels were outside the EPA's and WHO's series of principles. More than 1,800 times the World Health Organization (WHO) maximum amount of arsenic may be found in the water, which contains heavy metals including iron, arsenic and manganese. The same trend was reported for all other heavy metals tested. These staggering statistics prove the hostile consequences of gold-mining in the Obuasi community.

Moreover, Obuasi and its environs experienced incidences of cyanide leakage and effluent discharges from AGA's water treatment center into their rivers due to overflowing and dam failure; this led to the abandonment of villages altogether (ActionAid, 2006).

Furthermore, because mining represents a high-value land use alternative, vast expanses of arable lands that were previously readily available for agriculture have been significantly reduced (Benshaul-Tolonen et al., 2019). In addition to this predicament, the mining operations in Obuasi have resulted in farmers in the area losing their crops as well as the fertility of their land (Ros–Tonen et al., 2021) because of the overexploitation and subsequent degradation of customary fallow lands for mining purposes as a result of land shortages in the region (Akabzaa & Darimani, 2001).

4.2 Social Effects of Mining in Ghana (Obuasi)

Humans are affected by communal or reserved actions such as mining, which cause significant changes to their lives by way of their ability to meet their livelihood needs, their interaction with one another both for recreation and work, and their coping mechanisms to generally survive in society (Pereira et al., 2021).

The boom in mining activities, with its corresponding dislocation of indigenous people (Ofosu-Mensah, 2012), drastically disorients the social institutions and traditional principles of people in and around mining communities (Wireko-Gyebi et al., 2022). Displacement of populations, livelihood disruptions, inequality issues, and social injustices are all listed by the African Centre for Economic Transformation (ACET) as some of the social impacts of mining. As migrant workers invade communities thriving with mining activities, housing deficits occur, with subsequent inequality implications: housing units become expensive and therefore available to only a few, exempting mostly the indigenes who are unable to afford them (Akabzaa & Darimani, 2001). This situation ends in social inequality with respect to housing, as owners of housing units may over-exploit this opportunity to rip people off while denying other community members access (African Centre for Economic Transformation, 2017).

Within the Obuasi catchment area, the loss of arable lands for crop production underscores an interesting parallel between the environmental and social costs of mining. This is due to the fact that the loss of this land due to mining operations has had a direct impact on the population's ability to survive (Benshaul-Tolonen et al., 2019).People's sources of income have been threatened, their coping strategies have been limited, and eventually they are unable to sustain themselves and, therefore, they remain poor (Pereira et al., 2021).

Also, depending on the susceptibility of one’s livelihood source to environmental changes, there is a faction that benefits from mining operations and another that becomes impoverished by them (ActionAid, 2006; World Health Organization, 2017). This scenario results in conflicts within those communities. Moreover, since one’s level of education often determines one’s employability within the mining economy and subsequent economic status (Adu-Baffour et al., 2021), those lacking in these may feel excluded and embittered. According to Ofosu-Mensah

(2012), the influx of migrants into mining communities has consequently increased in some social vices, as was reported in Obuasi, with the high incidences of criminal activities and promiscuous lifestyles following mining operations.

4.3 Health Effects of Mining in Ghana (Obuasi)

Yeboah (2008) reports a direct correspondence of several ailments to the commencement of mining in the Tarkwa mining area. The prevalence of such ailments decreased the further away individuals moved from mine sites (Teschner, 2013), validating the claim by Stewart (2020) that miners are prone to contracting several physical ailments that emerge from the toxicity of the mining environment as well as mental ailments because of the stress-prone nature of mining operations. Pereira et al. (2021), explicitly assert that globally, mining is the most harmful job one could engage in.

In Obuasi, biostatistics obtained by Friends of the Earth-Ghana showed a high occurrence of upper respiratory tract infection (URTI), malaria, and skin diseases (Awudi, 2002). Patients at the AGC hospital in Obuasi were found to have signs of arsenic poisoning. This was traced back to the company's mineral processing operations, which released pollution into the air (Mensah et al., 2022).

In addition, there is a parallel between the environmental consequences of mining and the health consequences of mining, the former resulting in the latter in most cases. As a consequence of mining operations, Yeboah (2008) found that the high frequency of malaria recorded in the Obuasi municipal may be attributed to mosquito breeding in contaminated water courses, tailings dams and other stagnant fluids gathered in holes and pits. Respiratory diseases were also linked to air pollution caused by the mine's open pits and processing units, which released dust and other chemicals into the atmosphere (Mining Health Initiative, 2013). Fever, skin infections, and diarrhea were attributed to the consumption of polluted rivers and other bodies of water in the community by residents (Aram et al., 2021). The cyanide and mercury that both ASMs and MNCs use in their operations, in addition to as deep-cast mines, result in incidences of heat exhaustion, high blood pressure, nervous system diseases, and myocardial infarction among their workers (Yeboah, 2008; Basu et al., 2015).

5.0 Conclusion

Even though mining operations in Ghana can positively impact the country and especially mining communities such as Obuasi, the negative consequences are quite conspicuous and consequential. Many studies have documented these operational negative effects in many mining areas such as Obuasi, highlighting the drastic environmental degradation, health complications, and social deconstruction that have occurred as a result of these operations.

At Obuasi, AAGL, through its Community-Based Agreement, should contribute considerably to the town's development while, at the same time, limiting the hazards its actions exert on the people. The Ghana government, together with all stakeholders, should reckon with these failures and take effective measures that can govern, control, and use their natural resources for the greater good of their citizens. Moreover, in order to develop sustainability competencies in the sector, stakeholders in Ghana's mining industry should seek to comprehend and implement the UN Sustainable Development Goals' Framework. Sanctions should also be placed on MNCs and even ASMs whose operations exert undue disadvantages on the people and the environment.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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