Intersection between Ecological Destruction and Human Rights: Study of Illegal Mining Activities in Ghana

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ABSTRACT

This thesis explores the intricate relationship between ecological destruction and human rights abuses, specifically focusing on illegal mining activities in Ghana, commonly known as *galamsey*. Drawing on green criminology theory and human rights framework, this research aims to unravel how criminogenic conditions influence people to engage in illegal mining activities in Ghana and how the failure to regulate illegal mining, which causes environmental degradation, affects the fundamental human rights of those living around such mining areas. In doing so, an autoethnographic recounting of my experiences as a Community Development Officer at AngloGold Ashanti Obuasi and Iduapriem Mines and a community member in a mining town Obuasi-Tutuka since childhood is used as the primary source of data to address the research questions. Secondary data sources, including news publications, scholarly articles, the internet, and electronic media, complement the primary data source. This thesis addresses these overarching questions: (1) What criminogenic (or crime-producing) conditions influence people to mine illegally in Ghana? (2) How does the failure to regulate illegal mining in Ghana violate the human rights of those living near the mines?

The study indicates that galamsey mining in Ghana causes environmental degradation, thereby affecting the right to a quality life for those living around such mining areas. Several diseases and ailments, including birth defects in pregnant women, have been linked to the release of toxic substances into the environment as a result of galamsey mining in Ghana. The study also reveals the criminogenic conditions that encourage galamsey mining in Ghana and the interventions to mitigate the environmental harm and human rights abuses driven by illegal mining.

The research underscores the importance of ensuring adequate employment opportunities, community engagement on the health impacts of galamsey, financial literacy programmes, and alternative sources of livelihood for mining communities, institutional and legal reforms, and sustained political will to protect the environment for future generations.

Keywords: Small-scale mining, illegal mining, Galamsey, mercury, Human Rights, Environmental Degradation, Green Criminology, Obuasi, Tarkwa, Ghana.

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DEDICATION

I dedicate this thesis to my lovely daughter, Phoebe Lori Gaisie, my son, Jackson Kevin Gaisie and my husband, Mr. Emmanuel Kelvin Gaisie. Words cannot express my gratitude for your immense support and prayers. Also, to the Ainoo-Ansah family, which comprises my siblings and lovely parents, I thank you all. God richly bless you.

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CHAPTER ONE

INTRODUCTION AND BACKGROUND

Africa holds about 30% of the globe's mineral resources. These minerals are vital in the world market due to their importance and thus attract numerous foreign investors to Africa. For example, pieces of jewelry are created from gold, silver, and diamonds, tantalums are used in cell phones and laptops whereas manganese is a vital element of low-cost stainless steel (Butler, 2011). According to Zhang (2011, as cited in Edwards et al., 2014), investments from Chinese financiers into African mining increased fourfold to US$103.4 billion per year from US$25.7 billion between 2000 and 2009. This was comparable to foreign investments from states like Australia, Canada, Russia, Brazil, and India (Janneh & Ping, 2011).

Gold can be mined on a large scale or small scale. Large-scale gold mining is carried out by transnational mining companies primarily from Canada, South Africa, Australia, the United States, and the U.K. Large-scale mining involves the use of highly technological mechanical extraction processes. This form of mining, according to Yankson & Gough (2019), mostly occurs underground. Artisanal and small-scale mining (ASM), on the other hand, relies primarily on simple tools for extraction. Artisanal and small-scale mining occurs globally, but is mostly prevalent in emergent nations in Oceania, Africa, Asia, and South and Central America (Dorner et al., 2012). In Ghana, gold is mined on both a large scale and a small scale. Foreign persons are the main actors behind large-scale while small-scale mining, known locally as Galamsey, is practised by indigenous community members. Artisanal small-scale gold miners in Ghana — or galamseyers — are of two types. Some officially acknowledged small-scale miners operate according to a formal small-scale gold mining process (registered small-scale miners). Any Ghanaian citizen who is 18 years or older can obtain a permit for a parcel of land to mine on a

small scale (Teschner, 2012). The other type is the unregistered small-scale miners who do not operate according to the formal small-scale mining process but mine illegally.

Raised in a town that is considered to be the heart of mining in Ghana, I have always been fascinated by the natural environment and disturbed by how humans continually pollute it. Growing up, I witnessed several mining activities in both large-scale and small-scale mines. However, after repeated attempts to sensitize the communities around the mine catchment areas on the need to maintain a healthy environment due to the proliferating practice of illegal mining at the time (through my prior work as a community development officer at AngloGold Ashanti Obuasi and Iduapriem mines), I realized that Ghana's environmental problems require more than public education. I can vividly recall how a close family friend lost her son when he fell into an open pit left by mining activities in an area of town where we all played as kids. The trauma the boy's family experienced, as well as that felt by his friends, was significant. We, his friends, returned home after the incident, so afraid and anxious to have to report the event to his mother, who then reported it to the leaders of the community, who subsequently sought help from community members to search for our friend. The area had looked like a pool we could swim in; we did not know it was a pit dug for mining activity that was left uncovered and had filled with rainwater. My friend jumped in first and never returned. We called his name several times without any response before we rushed home to tell his mother what had happened. The community, upon seeking help and reaching the scene, retrieved his dead body.

This was a very traumatizing incident for me; it is why I am interested in mining issues, especially small-scale mining activities. My Bachelor's degree dissertation was titled "The Effects of Illegal Mining on Mining Companies in Ghana: A Case Study of AngloGold Ashanti Mine, Obuasi." In it, I examined the effects of illegal mining on large-scale mining companies

and communities in Obuasi as well as the individuals involved in the practice of illegal mining. At the time, there were many recorded deaths of illegal miners who had endangered their lives by passing through pipes and other dangerous equipment, creating holes, and making other efforts to mine in underground facilities belonging to large-scale companies. As a community member who had several internships with mining companies while in school, I became worried and asked myself why these young and vibrant men and women would endanger their lives as such. Often, they appeared motivated by destitution, including not having an opportunity to work in the mining industry, as well as a lack of education, lax laws, or the influence of gangs seeking to gain illegal profit by disrupting mining operations. My interest further led me to work as a community development officer at AngloGold Ashanti mine, Obuasi. I had lots of engagement sessions with stakeholders of the mine, including but not limited to community leaders and leaders of small-scale miners associations, illegal miners, and others.

The issue of illegal mining gradually became a political campaign issue. Promoting the small-scale mining sector was one easy way for political figures to appear compassionate to the unemployed youth and the various families for which they are responsible (Teschner, 2012). Several such messages were heard during election campaigns for some political parties in the country. For example, late President John Atta Mills, the New Democratic (NDC) Party flagbearer, held the then-ruling New Patriotic Party (NPP) accountable for the friction between large-scale companies and small-scale mines by accusing them of neglecting the needs of the unregistered galamsey miners by saying "Are our brothers in the galamsey business not Ghanaians?" (ModernGhana.com, 2008 as cited in Teschner, 2012 p. 312). According to Peace FM (2010, as cited in Teschner, 2012), the New Democratic Party was successful and came into power but was under pressure to fulfill the promise made to galamseyers, whereas the opposition

party (NPP) was also waiting patiently to capitalize on Mills's broken promises for the next election year. Teschner (2012) indicates that illegal mining is ubiquitous in Tarkwa, a key town in the Western region of Ghana. As mentioned by Ayee et al. (2011, as cited in Teschner, 2012 p. 312), "Ghanaian politicians are not known for this type of audacity and mining reforms are continually stifled by the dominance of the president and MP's tendency toward party loyalty".

In September 2006, the Ghana government embarked on a nationwide sweep of illegal mining communities named the "Fight Against Illegal Mining" (Hilson et al., 2007, p. 413). This sweep was carried out by the National Security Council under the patronage of the Ghana Chamber of Mines and sponsored by Ghana's chief large-scale mine operators. They began on October 10, 2006, from Prestea (Western Region of Ghana) to Obuasi Ashanti Region to Noyem and Ntronang (Eastern Region). All unlicensed operations were suspended, illegal mine types of equipment were destroyed, and several illegal miners were arrested (Hilson et al., 2007). According to Joyce Aryee, the then CEO of the Chamber of Mines, this military intervention was important since illegal operators not only "steal" gold but also "destroy environmentally sensitive installations such as tailings dams, dangerous chemical containment areas and infrastructure" (Hilson et al., 2007, p. 414). However, as mentioned by Hilson et al., (2007), despite the fact that the activities of illegal miners surely cause significant environmental damage, artisanal miners in Ghana do not steal gold from large-scale mining companies. Instead, "in mining localities such as Prestea and Noyem, where lands have been demarcated to multinationals, galamseyers have converged to work near surface deposits that these companies cannot extract economically" (Hilson et al., 2007, p. 414). According to him, they are not only mining deposits that could not be mined by these large-scale operators but are also creating income for the government in the form of collected gold. This makes any decision to attempt a

nationwide clamp down on galamsey activities problematic, especially when such exercises mostly result in human rights abuses. The "Fight Against Illegal Mining" did not solve the environmental and social problems of illegal mining but rather advanced a political agenda as Hilson et al., (2017, p. 414) note:

> All signs point to the sweep not being about addressing criminality and environmental problems as suggested, but rather being a strategic move engineered by President John Kufuor, whose New Patriotic Party (NPP) is working desperately to gain the confidence of the Ghanaian people; the securing of additional foreign investment for large-scale mineral exploration and mining activities is seen as an essential first step.

Dominant discourses depict illegal miners as criminals who disregard the destructive consequences of their activities (Babut et al., 2003 as cited in Ofori & Ofori, 2018). This is most obvious in a current anti-Galamsey campaign that is ongoing in the media targeting the negative social and environmental impacts of illegal mining (Adogla-Bessa, 2017, cited in Ofori & Ofori, 2018), which has led to the destruction of equipment and arrest of a number of illegal miners (Ghana Web, 2017 as cited in Ofori & Ofori, 2018). Issues of illegal mining in Ghana and some African countries have become more relevant recently, and therefore, it is an important social problem that needs further research.

Mining comes with several environmental challenges: "Sometimes one is tempted to believe that the mineral endowment of most African countries is more of a curse than a blessing" (Duncan, 2020 p. 1). The reason is that several mining communities face numerous environmental challenges, including but not limited to water pollution, farm destruction, exposure to harmful chemicals, and child labour.

Drawing on green criminology theory and a human rights instrument – namely the Stockholm Declaration of 1972 – I address the following questions:

1. What criminogenic (or crime-producing) conditions influence people to mine illegally in Ghana?

2. How does the failure to regulate illegal mining in Ghana violate the human rights of those living near the mines?

In doing so, I use primary and secondary data: an auto-ethnographic unfolding of my experiences will comprise my primary data, while publications, books, the internet and electronic media will be my secondary data sources. As intended in this thesis, mining refers to "the extraction (removal) of minerals and metals from the earth e.g., manganese, gold, copper, and tin…Africa harbours the world's largest mineral reserves of platinum, gold, diamonds, chromite, manganese, and vanadium" (Duncan, 2020, p.1; see also Taylor et al. 2009, as cited in Edwards et al. 2014, p. 302).

This thesis shows some criminogenic factors that explain why people engage in galamsey mining. The research discovered that Ghanaians engage in galamsey activities as a result of the criminogenic regulatory structure that exists in terms of the registration process to acquire a legal permit to mine, as well as the absence of well-stipulated compensation packages available to farmers who lose their lands to mining activities. The procedures, amount of money, and time frame to be granted a mining permit and concession discourage people, thereby making them cut corners to mine illegally. In addition, there is also a criminogenic market structure that exists, which encourages the practice of mining illegally. Inadequate employment opportunities and

education, lax regulations, weak enforcement of small-scale mining regulations, and poverty were additional identified factors that encouraged the practice of illegal mining.

This study illuminates several health and environmental impacts of small-scale mining in Ghana. Several children have lost their lives as a result of them falling into uncovered galamsey mining pits. Several bodies of water in the country have been contaminated, making them unsafe for use by community members. The turbidity, arsenic, lead, cadmium, and chromium levels in most of these bodies of water in mining areas are all above the World Health Organization (WHO), Ghana, and the United States (US) accepted values of water for drinking and for other domestic uses. These heavy metals are harmful to humans; however, communities still rely on these bodies of water for survival. Several medicinal plants, including *Acheampong* and *Agyama* have all been proven to be contaminated by these heavy metals. Strange diseases, including leukemia and kidney and liver diseases, were also proven to be a result of the concentration of these toxic substances in the environment and bodies of water. A link is made between heavy metals and food in mining areas as well as birth defects in pregnant women as a result of these heavy metal concentrations. Chemicals, including arsenic, lead, titanium, and copper, were found in root crops and soil in mining areas, including Tarkwa, Prestea, and Obuasi communities. Some illegal miners who encroach on the concessions of large-scale mining companies also lose their lives in the process due to the dangerous tunnels and channels they use to access the underground facilities of these mines as well as threaten community safety, peace, and security.

High-commodity value metals such as gold, tin, and tantalum, especially those linked to ASM activities, significantly add to world supply. These minerals when extracted, whether on a large scale or small scale, serve lots of purposes worldwide. In 1994, the ASM sector in South Africa was first acknowledged as a means to sustain social and economic development through

the involvement of Historically Disadvantaged South Africans (HDSAs) in the mining industry (Ledwaba, 2017). Mining contributes significantly to economic growth and development and there is therefore the need to efficiently address most of its environmental and social concerns to ensure the safety of both the environment and humans for maximum economic growth.

This thesis indicates that the rights to freedom, equality, and adequate conditions of life in a healthy environment that ensures the well-being of indigenous people have been compromised. Therefore, small-scale mining (galamsey) is a public emergency that needs urgent attention to safeguard the rights and well-being of humans living in the mining areas.

In Chapter One, I provide an introduction and a background of the study. Chapter Two provides a literature review for the study, offering insights into existing research on mining issues together with the environmental harms caused as the result of both large-scale and small-scale mining activities in Africa and, specifically, Ghana. Chapter Three presents the theoretical framework as well as the research methods. Chapter Four presents and analyzes the data, drawing on the concepts discussed in Chapters Two and Three. Chapter Five offers a conclusion and presents possible recommendations arising from this research.

CHAPTER TWO

LITERATURE REVIEW

This chapter explores mining in Africa before focusing on Ghana. It examines the various forms of mining together with their associated harms to the human species and environment. It discusses and explains the two major categories or types of mining in Ghana and how each came about in the country. Elaborating on these types of mining, this chapter also discusses traditional Ghanaian methods for the small-scale extraction of minerals as compared to recent methods of extracting minerals, specifically gold. It will further focus on recent methods of extracting gold on a small scale and their contribution to various forms of environmental and human harm.

2.1 Mining in Africa

Mining presents challenges for many African nations. Hayes and Burge (2003, cited in Cartwright, 2016, p. 418) note how severe accidents take place on a regular basis when mining coltan in Central Africa "[…] in areas near rivers where soil is unstable". According to Hayes and Burge (2003, p.16), tantalum-bearing materials can be sourced in various ways from artisan mining of alluvial deposits in Central Africa by the use of picks and shovels, "to large-scale open-cut mining in Australia, to underground room and pillar mines in Canada". However, techniques to access alluvial deposits have been exhausted and therefore mine production has increased recently for the extraction of tantalite (Roskill, 2002, cited in Hayes and Burge, 2003).

Other scholars, such as Cartwright (2016), have also highlighted some of the adverse effects associated with mining. Cartwright (2016 p. 418), in her article "Thinking into the Future: Eco-Risks of Extractive Mining Industries", states: "As the current Apple store

advertisement enticingly describes it, the newest iPhone is one amazing little machine and it 'feels great in your hand' (retrieved from Apple.com, February 23, 2014). What makes that smooth little smartphone tick? Coltan". The Magma Coltan (2012) report, prepared by a Costa Rican company that focuses on the peaceful mining of coltan in Costa Rica, highlights how the demand is high for coltan as a metallic ore that stores electrical energy for electronics. The high demand has consequently caused several residents of the Democratic Republic of Congo (DRC) to resort to illegally mining coltan regardless of the health implications, environmental degradation, and contamination caused to bodies of water. "In the most common form of coltan mining men, women, and children mine by hand. They dig basins in or alongside streams by scraping away the mud and letting the stream's water rush in. They then swirl the water around, creating a minor whirlpool that washes away lighter debris while the ore settles to the bottom" (Magma Coltan, 2012 cited in Cartwright, 2016, p. 418).

Bhebhe et al. (2013), in a case study of the alleged social and environmental harms generated in Gwanda District, Zimbabwe by illegal gold mining, demonstrate that poverty is a key motivator of illegal mining activities, which consequently causes destruction to bodies of water and land as a result of the use of chemicals like cyanide and mercury. Many a time, some of these farmers in the community sell their farmlands and join the troupe of illegal miners to engage in the act (Bhebhe et al., 2013). Mining activities involve the removal of soil from underground to the surface. Illegal mining activities take place mostly along rivers and streams. As I have witnessed, they construct sluice boxes and gradually and continuously wash the silt in the river or at the banks. As established by Bhebhe et al. (2013), this process eventually contaminates the river and affects its normal flow, disrupting usage by community members and resulting in soil erosion that further impacts the river's course. Where explosives are used, the

lives of community members are at risk from fire and ear damage. Sometimes informal miners pay with their lives when they are buried in collapsed shafts (Bhebhe et al, 2013). Contamination of surface water from the use of chemicals such as mercury can lead to illnesses. As well, community members who solely depend on rivers for food and water are placed at risk, especially when aquatic life in these mercury-contaminated rivers is consumed.

In the Nigerian context, there are also several challenges associated with mining. Nigeria, located in the West of Africa is blessed with several mineral resources including gold, tin, marble, limestone, and others that attract various mining interests into the country (Merem et al., 2017). According to Merem et al. (2017, p. 10), mining operations in the country have caused extensive environmental degradations "in the form of air particulate emissions, the flow of chemicals from abandoned mines and ponds, water contamination, littering of radioactive waste and land degradation". These have constituted serious hazards to the public, especially habitats around Ewekoro and Shagamu areas of Ogun state in the western region of Nigeria, as the result of quantities of air pollution released by solid mineral extraction through limestone excavation and the cement industry (Merem et al., 2017). According to Merem and their co-authors, there have been several cases of human mortality from lead contamination, several complaints of asthmatic attacks caused by airborne particulates mixed with toxic dust, and eye pains, as well as the reduction of kola nut production from local plantations as a consequence of the concentration and effects of the plumes on flora.

In other places around the middle belt of Nigeria, members of the community suffer the effects of destruction caused by deserted mines (Merem et al., 2017). For instance, Merem et al., (2017) report of how the people of Plateau State have unwillingly experienced repeated risks from radioactive mine tailings dispersed around fields in the Barkin-Ladi, Jos, Bukuru, Riyom,

and Bossa districts. This has led to the unexplained deaths of several community members who used high levels of monazite-rich sand for building. Mining presents many challenges to community members living around the mines. Merem et al. (2017) highlight several of the challenges faced by these community members. They identify several fatalities that befell Kawo village in the Madaka Rati local government of Niger state as the result of lead poisoning, together with the death of 400 children in 2010 at Zamfara state in Northern Nigeria due to the same lead poisoning and water contamination from coal mines in the Enugu area (Merem et al., 2017). The mining industry in Nigeria is to a large extent dominated by informal miners and this has historically been encouraged by high prices and the demand for precious stones and gems coupled with people's desire for a better life (Merem et al., 2017). However, the main aim of such a group of miners is to earn a living, compelling them to work in conditions that are dangerous to human life and environmentally unfriendly (Merem et. al, 2017).

Mining activities can impact human life and the environment directly and indirectly. This impact can be great or less severe depending on the scale of operation as well as the types of equipment used for the extraction of minerals. According to Duran et al. (2013, cited in Edwards et al., 2014, p. 303), direct impacts of mining take place within mine catchment communities or among individuals living around the mines, whereas indirect impacts happen as the result of "external infrastructure, pollution, synergistic developments, and population migration". Commenting on the direct impact of mining on the environment, it is evident how mine excavations directly or indirectly deteriorate the natural habitats of species "with the affected area ranging from <1 to several dozen km^2 in area, depending on the mineral being mined (Edwards 2001, cited in Edwards et al., 2014, p. 303). "A related concern is the spectre of downgrading, downsizing, and degazettement of protected areas (PADDD) to allow mining

prospecting and development" (Edwards et al., 2014, p. 303). According to Duran et al. (2013, cited in Edwards et al., 2014), approximately 44% of major metal mines in Africa are situated within 10km of protected areas. Table 1 shows examples of some African countries where downgrading, downsizing, and degazettement have taken place in protected areas for mining exploration. "Downgrading relates to a reduction in the level of legal protection, downsizing to a reduction in a park area, and degazettement to a removal of formal protection" (Edwards et al., 2014, p. 304).

Table 1: Downgrading, downsizing and degazettement at protected areas in some African countries

COUNTRY	LOCATION	YEAR	PADDD	MINING ACTIVITY	AREA KM^2
Guinea	Mount Nimba World Heritage site	1993	Downsize	Iron-ore prospect	15.5
Zambia	19 National Parks	1998	Downgrade	Mining	63,585
Uganda	Queen Elizabeth National Park	2005	Downgrade	Limestone	Unknown
Democratic Republic of Congo (DRC)	Basse Kando Reserve	2006	Degazette	Mining	Unknown
South Africa	Marakele National Park	2009	Downgrade	Unknown	Unknown
Tanzania	Selous Game Reserve	2012	Downsize	Unknown	200

Source: PADDDtracker www.PADDDtracker.org (accessed Jan 2013) as cited in Edwards et al. (2014, p. 304).

Roads and railways are constructed and expanded to make places for mining activities and easy transportation of minerals. All these activities affect human habitats and wildlife. People from different places migrate to mining communities for job opportunities in the mines or

embark on small-scale artisanal mining. They become miners who are described as "economically marginalized people using unregulated, improvised, and often harmful extraction methods to piggyback onto operations involving precious commodities, especially gold and diamonds" (Edwards et al. 2014, p. 304). The unregulated, improvised, and harmful extraction methods of local small-scale artisanal miners result in the release of chemicals like mercury and toxic substances into rivers for example gold, which are very harmful to human life and the environment (Durand, 2012). Carrington et al. (2011) note an increase in violence and other social harms in mining communities. However, there is little empirical research and factual understanding of the "criminological impacts of post-industrial mining regimes" as well as regulatory policies to address such problems (Carrington et al., 2011, p. 13).

Adding to the environmental challenges of mining in most African countries is the issue of corruption. Several researchers have discovered that countries with lots of natural resources that should be beneficial to the growth and development of their economy often discover that they are a curse. The natural resource curse is the condition where the benefits derived from resource consumption are below the overall operation cost (Corrigan, 2014). According to Edwards et al. (2014), Transparency International's corruption perception index (Transparency International, 2012) ranked several African nations where mining activities are thriving with a number of infrastructural developments very poorly in terms of corruption. Kolstad & Wiig (2009, p. 522) define corruption as "the abuse of public office for private gain". These corrupt activities inhibit transparency and accountability, resulting in the resource curse (Kolstad & Wiig, 2008, cited in Adams et al., 2019). This is because corruption results in the embezzlement of funds. A study on corruption in Ghana, a democratic country for the past 29 years, reveals that corruption is still an overwhelming issue (Asomah, 2023). Some politicians' accounts presented

in the study reveal how political parties are formed by a group of friends whose interests are mainly directed toward the embezzlement of public funds rather than serving the public's needs (Asomah, 2023). However, with weaker checks and balances these acts of embezzlement go unpunished and keep repeating themselves from one political party to the next (Asomah, 2023). Research by oil-rich developing countries reveals "corruption, transparency, weak institutions, and poor governance as causes of developing countries natural resource curse" (Adams et al., 2019, p. 2).

White (2018, p. 123 cited in Bedford et al, 2020), in his eco-global criminology perspective, notes how environmental crimes are mostly not defined by laws because they are executed by nation-states and the powerful in society: "destructive practices are in fact quite legal, precisely because they are facilitated by nation-states as well as corporations and other powerful actors". The idea of ecologically unequal exchange argues that "structures of social and environmental inequality between the Global North and Global South are founded in the extraction of materials from, as well as the displacement of hazardous production processes and wastes to, the Global South" (Frey and colleagues, 2019, p. 1 quoted in Bedford and colleagues, 2020 p. 482). Using the idea of ecologically unequal exchange, it is argued that Transnational Corporate Mining (TNC) in Africa supports crimes of globalization, which can "incorporate elements of state crime, political white-collar crime, state-corporate crime, and finance crime" (Friedrichs and Friedrichs 2002: 18 quoted in Bedford et al. 2020 p. 482). Using as an example an Australian-based company mining in Xolobeni, South Africa, Bedford et al. (2020) criticize how TNCs take advantage of local communities, damage the natural environment, replace regulatory processes, and cause instability in state governance.

African countries are faced with a huge mining boom greatly motivated by foreign investment (Edwards et al. 2014). The speed of this boom comes with the likelihood of environmental conservation being circumvented or totally ignored. Addressing some of these impacts and concerns will go a long way to protect humans and the environment.

2.2 Mining in Ghana

Ghana, previously known as Gold Coast, is located on the coast of the Gulf of Guinea with Accra its capital city. Its neighbouring countries are Cote d'Ivoire (in the west), Togo (in the East), and Burkina Faso (in the South). The exportation of cocoa has been the primary driver of the Ghanaian economy and Ghana is among the largest exporters of cocoa worldwide. Agriculture continues to be a vital economic sector for Ghanaians as it offers a source of livelihood for almost half of the population. Ghana is rich in natural resources and some of these natural resources, like gold, bauxite, manganese, oil, and timber, have contributed to placing the country among the rich nations in West Africa. It is amongst the largest gold producers in Africa and is endowed with abundant natural resources and vast agricultural lands that are instrumental to its development (Duncan, 2020). However, Ghana remains heavily reliant on foreign aid (Adams & Atsu, 2014) and is confronted with overwhelming ecological challenges – including environmental degradation associated with illegal mining – as its economic growth relies greatly on natural resources (Cobbinah et al., 2017). Gold is mined in Ghana on a large-scale and small-scale.

2.2.1 Large Scale Mining in Ghana

Large-scale mining activities consist of vast transnational mining companies that are primarily from Canada, South Africa, Australia, the United States, and the U.K. The Late 1980s brought in a new age for the mining industry in Ghana, after a period of movement from privately controlled companies to state proprietorship within the mining sector post-colonization (Tsikata, 1997; Akabzaa & Darimani, 2001, cited in Ofori, & Ofori, 2018). This period led to less state control with policy creation geared towards the attraction of "foreign direct investment under the World Bank-led Structural Adjustment Program" (Hilson, 2001, quoted in Ofori & Ofori, 2018, p. 357).

Tax reductions and profitable interest rates were implemented to attract foreign international mining companies (Hilson and Potter, 2003, cited in Ofori & Ofori, 2018). This enticed several foreign mining companies, which eventually resulted in the leasing of farmland and deforestation for large-scale mining projects (Ofori & Ofori, 2018). Bauxite, iron ore, and manganese are also produced in commercial quantities. Large-scale mines are the most viable market prospects for U.S. mineral exporters. This form of mining requires a high level of automation and is very capital-intensive. These companies contribute significantly to the economic growth of a country. They operate under mining licenses and therefore are mandated to pay royalties ranging from three to six percent of their gross revenue (Larsen et al., 2009). They pay "corporate tax, employee income tax, social security payments, and national reconstruction levy" (Yankson & Gough, 2019, p. 123). Large-scale mines also engage in Corporate Social Responsibilities (CSR) in the catchment communities that are affected by their activities. However, some of "these policies are often couched in terms aimed at mitigating

business risk and creating business opportunities (Innes, 2009), rather than long-term social sustainability" (Carrington et al., 2011, p. 10).

Large-scale mining, also referred to as legal mining, produces more than 95 percent of the world's entire mineral production and gives employment opportunities to about 2.5 million people across the world (Emmanuel et al., 2018). Nineteen large-scale mining companies operate in Ghana, of which 16 are gold mining companies, and the other three are manganese, diamond, and bauxite. Examples of some of these mines are Ashanti Goldfields, Kinross Gold, Golden Star Resources, AngloGold Ashanti, and Newmont Mining (Akabzaa & Darimani, 2001). With the exception of two mines, namely Ashanti Goldfields Company's Obuasi mine (currently known as AngloGold Ashanti) and Prestea Gold Resources Limited, which are underground-operated mines, all the remaining are surface-operated mines (Akabzaa & Darimani, 2001). "These companies are largely privately owned with a 10 percent free share and an optional 20 percent share for the government" (Emmanuel et al., 2018, p. 44).

Before the era of structural adjustment, the Ghana government had 55 percent shares in large-scale mines; however, with private investors now playing the principal role, foreign companies now own 70 percent of shares in these large-scale mines (Akabzaa & Dramani, 2001). According to Emmanuel et al., (2018), the interest of these large-scale mining companies is a major focus for the government of Ghana. Most of these large-scale companies take advantage of their legitimate status to the disadvantage of the environment, and most of their operations affect the environment negatively, especially rivers as water is a vital component of their operations (Emmanuel et al., 2018). There are three operational stages namely mining, processing, and mineral conveyance for large-scale mining and water is important to all these stages, especially during processing. Water is also used as a coolant for cutting edges and

inhibiting fraction-induced ignition. Also, surplus mine water is at times treated for reuse or dispensed back into the rivers in the communities (Emmanuel et al., 2018). Emmanuel et al., (2018), further note that the cost of treatment for surplus mine water is very expensive and most companies dispense untreated water back into community catchment Rivers.

Most of these companies in these mining areas rely heavily on these rivers and water bodies for the release of chemicals, which compromises the health of community members, who rely on these river bodies for food and water. Most of these bodies of water have either dried up or are polluted with chemicals. Rivers like Kwabrafo, Wheaseammo, Kunka, Nyam, Pompo, Jimi, and Akapori have all been massively impacted by mining and other human activities. These fresh bodies of water have been affected "through pollution from discharged mining waste and seepage from tailings and waste rock impoundments" as well as the use of water for processing ore (Emmanuel et al., 2018, p. 46). Fish in these rivers, especially Kwabrafo, have all perished as the result of "intoxication", according to an interview by Yeboah with an agricultural extension officer (Emmanuel et al. 2018, p. 46). Abompe and Sanso communities complain that their water may have been adulterated by underground chemicals (Emmanuel et al., 2018).

Gold mining in Ghana benefits the economy but to the detriment of the local mine catchment communities. As reported by Akadzaa and Darimani (2001), almost all the mines in Ghana are surface-operated mines with the exception of two, and therefore mining removes the topsoil and deprives the land of all the vital nutrients needed for agricultural purposes. Emmanuel et al., (2018) note that mining activities such as huge excavations by Newmont Company in Kenyasi and Tarkwa have changed the landscape of these communities, making it very difficult for one to undertake agricultural or other livelihood activities in the area. There were several instances where community members lost their farms to mining activities.

Newmont has excavated three key pits with heaps of sand from the pit covering large areas of the land that cannot be used for any other purpose (Emmanuel et al., 2018).

> Almost 31,237 square kilometres of Ghana's land area (13.1%) is under concession to mining companies. The total agricultural land lost due to large-scale gold mining in the Tarkwa, Bogoso/Prestea and Damang concessions is 4,935 hectares, representing 25.5% of Bogoso/ Prestea and Damang and 5% of the Tarkwa Nsuaem municipality's total agricultural land. This figure, 4,935 hectares, represents 45.42% of all agricultural land within the concessions. Although 30.63% of land in these three concessions was still under agricultural use as of 2002, it is threatened by future mining activities (Emmanuel et al., 2018 p. 48).

In Ghana, compensation, a payment to people whose property has been lost, damaged or affected by a problem, is one of the basic requirements for obtaining land for any purpose (Darko, 2017). This compensation requirement is evident under Section 4.3 (d) of Ghana's 1999 National Lands Policy, which states that "no interest in or right over any land belonging to an individual, family or clan can be compulsorily acquired without payment, in reasonable time, of fair and adequate compensation". Article 257, section 6 of the 1992 constitution of the Republic of Ghana as well as section 1 of the Mining and Minerals Act 703 (2006), however, describe minerals as belonging to the state. It reads:

> Every mineral in its natural state in, under, or upon land in Ghana, rivers, streams, water courses throughout the country, the exclusive zone and an area covered by the territorial sea or continental shelf is the property of the republic and is vested in trust for the people of Ghana.

By the Constitution, minerals found in any land are entrusted to the president on behalf of the people of Ghana (Okyere, et al., 2021). Also, the 2006 Minerals and Mining Act (Act 703) and 1962 State Lands Act (Act 125) make room for payment or compensations to be paid to affected farmers; however, according to Darko (2017, p. 12), "the Administration of Lands Act (ACT 123) stipulates that royalties and rents be paid annually to traditional leaders who own lands as a form of compensation. Though the compensation of farmers is based on legal foundations". Ayee et al. (2011 quoted in Darko, 2017, p. 12) note that there is lots of confusion and variability regarding a fair and suitable package, which has rendered "compensation processes to negotiations between concerned stakeholders (affected parties and mining companies)". Some mining companies, however, disregard these requirements and deal with the traditional leaders of the land and not the affected farmers, whereas others who otherwise adhere to the law pay amounts that are insufficient to sustain these farmers (Arezki et al, 2013, cited in Akadzaa & Darimani, 2001). These farmers are only entitled to the farm produce on the land and compensation calculations are based on specific rates assigned to each type of produce (each produce has an assigned rate per unit. For example, Aboagye (2014, quoted in Darko, 2017, p. 12) in a study conducted at Ntotoroso community, the location for the Newmont Ahafo Mine owned by the Newmont Ghana Gold Limited (NGGL), notes that "the NGGL refused to pay for compensation for affected uncultivated and fallow lands during the initial stages of its operations in the Ahafo mine citing that, Ghana's Mining Act did not adequately address the compensation of land loss and hence their inability to compensate for land loss". These farmers not being compensated for the land means that they are entitled to and compensated for only the crops on the land.

The below table gives examples of compensation packages paid by NGGL at Ntotoroso community to some affected farmers during the initial stages of their operations:

Table 2: Examples of compensation packages paid at Ntotoroso community

	GH ₵
An acre of cocoa farm	3400.00
An acre of teak	6,900.00
An acre of oil palm	900.00

Source: Yaro (2010) cited in Darko (2017 p. 12)

Yaro (2010), further discovered that there were disparities in compensation packages and cited examples of communities like Akyem and Tarkwa in the Eastern and Western regions respectively where affected farmers had received higher packages compared to that of Ntotoroso community. Furthermore, most of these farmers use these packages for the upkeep of their families and end up with nothing after a period of two to three years. Consequently, local communities resort to the practice of illegal mining to compensate for lost income based on this "concessionary model" (Emmanuel et al., 2018, p. 48).

With respect to the health impact of mining, a study in five communities namely Anyinam, Sanso, Abompe, Tutuka and Anyimadukrom in Obuasi, Ghana, by Emmanuel et al. (2018) revealed that catchment communities around AngloGold Ashanti operations in Obuasi suffered from fever, colds, catarrh, malaria, skin diseases and respiratory infections. According to these authors, skin diseases accounted for 17.7 percent of the diseases reported in their study, especially for community members in Anyimadukrom, who were closer to the Pompora Treatment Plant (PTP) where chemicals such as arsenic (Sulphur dioxide) were used whereas Malaria, accounted for 42 percent. Salifu et al. (2003) discuss how open pits created as the result of mining operations become breeding places for the vector that causes malaria in Africa, which

is the Anopheles mosquito (Akadzaa & Darimani (2001). However, the establishment of the AngloGold Ashanti (Ghana) Malaria Control (AGAMaL) program by AngloGold Ashanti Ghana (AGAG) was a good venture that helped fight the issue of malaria that was affecting surrounding communities' health and wellbeing.

The use of heavy operations in mining generates dust and noise pollution in mining areas. In the case of Tarkwa, out of the 16 large-scale mining companies in Ghana, eight of them are located in Tarkwa (Akadzaa & Darimani (2001). This city has the highest concentration of large-scale mining companies in Ghana, some of which are Goldfields (Gh) Limited, AngloGold Ashanti Iduapriem mine, Barnex Ltd., Ghana Manganese Company (GMC), which is the only manganese company in Ghana, and Abosso Goldfields. According to Akadzaa & Dramani (2001, the major concern of the catchment communities around the various large-scale mines in Tarkwa is the potential for cyanide contamination of ground and surface water resources. According to their study, samples of water obtained from well, boreholes, and streams within Tarkwa showed astonishing results of elevated content of "faecal chloroform, suspended solids, chloride, colour and manganese content, particularly in the Angbenabe River at Nkwantakrom" (p. 49). Mining companies responded to this threat through the provision of hand-dug boreholes, which proved futile as most of these wells are in a deplorable state and are as polluted as the water sources they are meant to replace. Blasting also poses a danger to communities, especially in terms of noise and cracks in houses situated closer to the blasting sites. Atmospheric dust exposure and other toxic elements from mining activities expose one to various forms of diseases like classical silica-induced pneumoconiosis (Okyere et al., 2021).

People from all over the country travel to mining sites in search of job opportunities. However, according to Okyere et al. (2021), the migration of all these people leads to an increase

in commercial sex workers in such communities. The reason is that all these people migrated for job opportunities; however, not all end up getting access to work in such companies and resort to the sex trade. This has resulted in an increase in sexually transmitted diseases (STDs) in mining communities in Ghana (Salifu et al., 2013, cited in Okyere et al., 2021).

Large-scale mining companies provide employment to over 27,000 people (Minerals Commission, 2015, cited in Okyere et al., 2021). These companies engage in Corporate Social Responsibilities (CSRs) in the catchment communities and beyond. Large-scale companies help provide roads, electricity, schools, hospitals, teachers' quarters, water, etc. to mine catchment communities and are also easily traceable to amend most of their environmental damages through grievances and complaints from communities. However, these communities have suffered air and water pollution together with various forms of environmental damage as the result of these operations, putting community members' lives at risk.

2.2.2 AngloGold Ashanti

Based on production, the third largest gold mining company in the world is AngloGold Ashanti (Afanyi-Dadzie, 2019). The Company's portfolio of 14 operations in nine countries as of 31 December 2018 (Argentina, Australia, Brazil, Ghana, Guinea, Mali, the Democratic Republic of Congo, South Africa and Tanzania) encompasses long-life, comparatively low-cost operational assets with diverse ore types, located in significant gold-producing counties around the world (Afanyi-Dadzie, 2019). According to Afanyi-Dadzie (2019), these operational assets are assisted by three greenfield projects in a tenth country and a focused global exploration program. Greenfield project is "one which is not constrained by prior work; It is constructing on

unused" (Song & Woo, 2013, p. 132). The company's operations and greenfield projects are categorized into Australasia, Americas, South Africa and Continental Africa regions.

AngloGold Ashanti's business operations span the full cycle of mining – from surveying to the production of refined gold together with selling (Afanyi-Dadzie, 2019). They are also keen on protecting the environment and the catchment communities within their operations. They aim to create value for their employees, shareholders, and partners (both social and business) by means of mining responsibly and orderly allocation of capital to sustain and build up their social capital (Afanyi-Dadzie, 2019).Although AngloGold Ashanti's main intention is to mine gold, it also works towards other value-creation minerals by utilizing its existing assets, skills, and experience to enhance value delivery. The company's vision is to be the leading company in the world in terms of mining. AngloGold has six values. The first value is safety, which is always used as a slogan during morning safety meetings in every department. Treating each other with dignity and respect is the second value. The remaining four are respect for the environment, value for diversity, being accountable for their actions, and being accountable for the progress of the communities within which they operate. As mentioned earlier, most of these large-scale companies claim accountability for their actions through most of CSR and engagement sessions with catchment communities unlike most small-scale companies (both legal and illegal).

2.2.3 AngloGold Ashanti (Ghana) Limited

AngloGold Ashanti (Ghana) Limited has two major operations in Ghana, namely the Iduapriem mines in Tarkwa, the western region of Ghana, and the Obuasi mine in Obuasi, the Ashanti region of Ghana. AngloGold Ashanti Iduapriem mines operate as an open-pit mine,

which contains the Teberebie and Iduapriem mining leases. This lease covers an area of 110km^2 concession (Afanyi-Dadzie, 2019). During my work with the Sustainability department as a community development officer, 19 communities were on the mine's list for engagement. Iduapriem mine began operation in June 1992 and became part of the AngloGold Group after the merger with Ashanti Goldfields Limited in 2004 (Afanyi-Dadzie, 2019). According to Afanyi-Dadzie's (2019) report, Iduapriem Mine provides employment opportunities for about 2500 people.

However, the AngloGold Ashanti (Obuasi) mine is an underground-operated mine. During my national service orientation in 2012, we were informed of the Obuasi mine being the oldest mine in Ghana. The mine has been in existence since the 1897 and is presently operated by AngloGold Ashanti after the business merged with Ashanti Goldfields Limited in 2004. The mine operates on a 201km^2 (20,100 ha) mining lease (Afanyi-Dadzie, 2019). Fifty-nine catchment communities were engaged as mine communities during my work as a community development officer. Following some challenges faced by the mine at the time, including illegal mining activities, the Obuasi mine was placed on a limited operations phase (LOP) in 2014 and several workers, including myself, were laid off as redundant. The mine transitioned to a care and maintenance stage beginning in 2016 to be able to undertake developmental projects underground. Considering the fact that the Obuasi mine has been in existence for decades, this move was intended to usher the mine into a more modern and mechanized underground mining operation.

AngloGold Ashanti, which owns the Obuasi gold mine, is one of Ghana's longest-producing underground and open pit mines. Its stated intention was to carry out a major restructuring in 2014 (*The Economist*, May 2014). The Obuasi Mine directly employs about

4,300 people. Initial figures projected by AGA executives at a general meeting with employees on May 22 indicated that 400 staff would be made redundant by the close of 2014 (*The Economist*, May 2014). A statement issued by the local Member of Parliament, Hon. Kwaku Kwarteng, estimated that 3,700 workers would be made redundant in total, leaving a remaining workforce of 600 staff to assist the restructuring process of the concession (The Economist Group, 2014). A temporary shutdown of underground operations is imminent to kick-start a redevelopment phase of the concession that would see greater use of machinery over human labour—in order to extend the life span of the mine further to 17 years of operating capacity.

Aside from the restructuring exercise, *The Economist* (May 2014) points to other factors that contributed to the decision of the redundancy exercise which were: the weak currency of the country, which increased the cost of fuel prices and high inflation, leading to calls for large wage increases from staff; ore depletion, since the mine was 117 years old in 2014; and lower international gold prices. Additionally, there were ongoing power shortages in the country.

The Obuasi Mine has been the centrepiece of commercial activity for the Obuasi community and crucially for the Ghanaian state. It has provided a solid revenue stream from gold export earnings throughout the decades.

2.2.4 Artisanal Small-Scale Mining in Ghana

Artisanal small-scale mining in Ghana is executed commonly by indigenous companies. Indigenous mining operations, however, tend to be comparatively simple and rely on low-cost equipment, especially from Chinese manufacturers (Teschner, 2012). This method of mining relies primarily on non-mechanical processes of extraction. Artisanal and small-scale mining

(ASM) occurs globally, but is usually prevalent in emergent nations in Asia, Africa, Oceania, and South and Central America (Dorner et al., 2012). Artisanal small-scale gold miners are of two separate types in Ghana. Some officially recognized small-scale miners operate according to a formal small-scale gold mining process. To achieve recognition, any Ghanaian citizen who is 18 years or older can obtain a permit for a parcel of land to mine on a small scale (Teschner, 2012). Even though the application process is accessible, about 85% of Ghana's small-scale mines do not go through the official licensing process (Hilson and Potter, 2003 as cited in Teschner, 2012). This is likely due to the cumbersome process one must go through to register, as well as the cost of capital involved in registering. By indigenous agreement, documented legal mines are usually mentioned as "small-scale mines" and the undocumented mines are referred to as "galamsey" (illegal) mines (Teschner, 2012, p. 309).

Mantey et al. (2017 as cited in Otoo, J. 2021, p. 4), define "galamsey" as the "practice of illegally mining and or extracting gold found either below soil or water surface in Ghana". Aubynn (2009, p. 572) further describes the term as the practice of "discretely gathering minerals found just below the soil surface and selling them in contravention to state law". According to Otoo (2021), Aubynn's definition of galamsey spotlights the origin of the term. "Galamsey" was created in the colonial era by those who saw how "gold was gathered and sold in the Gold Coast" (Otoo, 2021, p. 4). According to Wilk (1993), the trade of gold between Europe and West Africa brought the Ashanti kingdom more wealth and power and hence the name Gold Coast was given to the region. Thus, the use of the name "Gold Coast" persisted until after independence in 1957, when the country was renamed Ghana. The word "galamsey" means "gather" and "sell".

It is extremely important to draw a clear line concerning what is referred to as illegal mining and what ASM is since they are both logistically similar in their operations. "Illegal

mining refers to mining operations carried out without a valid legal permit, in which operators are not entitled to their own concessions and most often mine within the authorized concessions of other companies or areas prohibited for mining purposes" (Ofori, & Ofori, 2018, p. 356). ASM, conversely, is the broader term to connote all mining activities performed on a small-scale regardless of whether they are executed legally or illegally. The different terms suggest a separation in their activities but both galamsey mines and small-scale mines are indistinct in their functioning (Teschner, 2012). For this reason, most Ghanaians and several researchers use the term galamsey to indicate all small-scale mining activities (Teschner, 2012). For the purpose of this research, illegal mining will be used to refer to all unregistered mines.

ASM, if managed efficiently, can offer employment to over one million people, especially those in rural communities as well as generate revenue for the government in Ghana (Akadzaa & Dramani (2001). A serious concern is the recent friction and rivalry between small-scale miners and large-scale mining companies. The rise of large-scale mining companies is a contributing factor to this friction in that their existence limits the lands on which native small-scale miners can utilize or control (Akadzaa & Dramani (2001).

Generally, small-scale mining in Ghana causes lots of damage to the environment and bodies of water. This degradation of the environment happens regardless of whether they are registered small-scale mines or unregistered since they are both indistinct in their operations (Teschner, 2012). According to Amponsah-Tawiah and Dartey-Baah (2011, cited in Okyere et al., 2021), as of 1988, Ghana lost 41.7 billion Cedis yearly through environmental degradation. A greater portion of this degradation is the result of mining activities in the country (Okyere et al, 2011). Small-scale mining activities along riverbanks also distort the natural flow of these rivers thereby causing flooding in nearby communities and destroying properties and lives during

heavy rainfall (Emmanuel et al. 2018). Lands are greatly affected due to the degradation caused by small-scale mining activities. “Throughout rural regions of the developing world, peoples’ livelihoods are structured around an assortment of agrarian activities and complementary subsistence occupations” (Hilson and Banchirigah, 2009 p. 5). Community members therefore suffer from the degradations caused to the lands as a result of mining activities especially small-scale mining activities.

The story becomes so sad and interesting when the camera is tilted towards the practice of galamsey (illegal or unregistered mines) in Ghana. Illegal mining poses threats to human lives and children. This is because most of the pits created by “galamseyers” (illegal miners) are left uncovered (Bhebhe et al., 2013). According to the Ghana Health Service, the use of mercury in the activities of illegal miners together with the pollution of bodies of water, are very dangerous to human health. The mercury when consumed by humans can damage their central nervous system (Agbesi, 2017). Dawiejuah et al., (2015) have asked for continual surveillance of water bodies in small-scale mining areas in Ghana after their research showed excessive levels above World Health Organization (WHO) limits of metals in water bodies (Ofori & Ofori, 2018). The Environmental Protection Agency (EPA) of Ghana has also suggested there will be a shortage of potable water in the country as a result of the actions of these miners (Allotey, 2017 as cited in Ofori & Ofori, 2018). Farmlands have been destroyed by excavators in their efforts to extract minerals from the land and pits created are mostly left uncovered. Children usually abandon school to work as panners, carriers, and processors at Galamsey sites (Tschakert & Singha, 2007). Aside from working at galamsey sites as panners, carriers, and processors, some of these children in the community also die as a result of falling into some of the uncovered pits created by these illegal miners.

Eicher (2003) argues that “Mercury (Hg), the only liquid metal, has been used in the mining industry to amalgamate and concentrate precious metals since the Phoenicians and Carthaginians applied it around 2700 B.C.” (as quoted in Tschakert, P., & Singha, K. 2007, p. 1308). However, in recent times, mercury is frequently used by small-scale gold miners in most emerging nations (Veiga et al. 2006). The 1933 mercury law banned the use of mercury at the time, though it was still being used in ASM. There was therefore a sharp increase in its use in Ghana following the legalization of its usage in the Artisanal small-scale mining sector in 1989 (Donkor et al., 2006a).

Cyanide substituted for mercury in large-scale gold mining operations after the mercury law in 1933, which banned the use of mercury; however, the galamsey resorted to mercury usage in recent times when mining gold proved more difficult (Rambaud et al., 2000). According to Amegbey and Eshun (2003), 97 percent of the 25000 kg of mercury brought into Ghana from Europe and Canada around 1994 to 1999 was intended for the Artisanal small-scale mining sector. Panning with mercury is the common process of gold retrieval in Ghana from both alluvial and hard rock mining sites according to Amegbey and Eshun (2003). According to Tschakert and Singha (2007, p. 1308), the process of hard rock mining involves the “digging of shafts with picks, shovels, hammers, and chisels or blasting with dynamite”, followed by the “crushing and grinding of ore rocks with mechanized metal mortars and pestles”. However, the procedure for the retrieval of gold is identical under both methods (thus alluvial and hard rock mining methods). Tschakert and Singha, (2007) describe the process of extraction of gold by Galamseyers in Ghana as follows:

> First, the gold-containing material is washed on sluices where the heavier gold particles are caught and concentrated on carpets or towels due to gravity. The concentrate from the

> sluice box is re-assembled in rubber dishes or wooden pans. Through panning, the undesirable sediments are separated from the gold particles until the latter clearly appear in the final concentrate. Next, a carefully gauged quantity of mercury is poured into the miner's palm and added to the concentrate in the pan. Mercury is usually mixed by hand with the concentrate, forming a lump or ball of mercury–gold amalgam. Water is added several times to discard tailings and remove lighter particles until only the amalgam remains. The amalgam is then squeezed into a piece of cloth to recover excess mercury (often re-bottled and used again). Some miners put the fabric with the amalgam into their mouth to suck out additional mercury. Finally, the amalgam is placed into a small can on a stove or coal pot to roast for 15–40 min, depending on size. Burning can also occur with a blowtorch. Mercury losses occur at various stages during gold production: (1) during amalgamation, where mercury may be washed out during the gravity washing; and (2) during burning, where mercury, with its high volatility, is released into the atmosphere. After burning, a sponge-like gold dore´ stays behind in the can. When the gold has cooled, it is weighed and ultimately sold. Due to impurities and trapped mercury, the gold often undergoes a refining process off site that involves additional heating steps and the use of acid, borax, and soda ash (pg. 1308-1309).

Gold in a dore form simply refers to a rough or an unrefined gold which needs a further heating or refining process to get rid of the impurities and trapped mercury. Veiga and Baker (2004) estimate that for every single gram of gold generated in ASM, one or two grams of mercury evaporates (as cited in Mantey et al., 2020).

According to Duncan (2000), the extraction and processing of gold have long been the source of economic wealth for many nations and employment for several community members.

The ASM sector's quick growth (especially in sub-Saharan Africa) and descriptions of it being a source of livelihood for vulnerable groups comprising children and women (Hilson, 2008a, 2008b; Hilson and Banchirigah, 2009), suggest that its existence is connected deeply to peoples' destitution (Hilson, 2009). Women make up about 50 percent of the small-scale mining labour force (Hilson, 2001 as cited in Teschner, 2012). According to Emmanuel et al. (2018) about 100 illegal miners got buried in a galamsey pit that collapsed near Offin River in a report from Dunkwaw Offin in the central region of Ghana. A report from modern Ghana in 2010 also indicated that over 112 small-scale miners including pregnant women and individuals between the ages of 17 and 35 got stuck under a mining pit in Akyempem Breman in the upper Denkyira East Municipality (Okyere et al., 2021). Several of these catastrophes happened in mining sites in Ghana, claiming the lives of individuals involved (Yelpaala and Ali, 2005 as cited in Okyere et al., 2021). Farmlands are being destroyed with excavators to extract gold from the land and rustic agricultural families are diversifying into small-scale mining due to seasonality and declining farm output (Ofori, & Ofori, 2018). Women and children are excessively open to dangerous mercury fumes that can result in birth defects and brain damage (Hilson, 2002a; Hentschel et al., 2002). Some young women are molested by the men on site due to their vulnerability to sexual violence. Another interesting aspect of the trend small-scale mining has taken in Ghana is the influx of Chinese immigrants in the country to engage in the act. Teschner (2012 p. 309), using the case of Tarkwa (in the western region of Ghana) in his analysis, indicated how the "Chinese run Chang Fa engine depot in Tarkwa, importing powered rock crushing machine and water pumps designated specifically for small-scale mining applications".

Environmental crimes are often not well-defined by law as crimes (Bedford et al. 2020). Mining comes with lots of challenges but the issue becomes more difficult when the camera is

tilted to the practice of small-scale gold mining. As stated by Teschner (2012 p. 308), The "current formalization system for small-scale gold miners in Ghana has been undermined to the point where the small-scale mining laws no longer capture the reality of the sector's activities". The practice of illegal mining especially threatens the basic needs of life for communities around such areas where they are being practised and therefore a great concern that needs careful address.

CHAPTER THREE

THEORETICAL UNDERPINNINGS

This chapter outlines the theoretical underpinnings of this research and the methodology used. Green Criminology and the Stockholm Declaration on Human Rights provide the theoretical foundations of this research. The qualitative research strategies and data collection methods/sources employed are reviewed along with the ways in which reflexivity and rigor are achieved to ensure credible results.

3.1 Green Criminology Theory

According to Ruggiero and South (2013, p. 360), Green Criminology is "a framework of intellectual, empirical and political orientations toward primary and secondary harms, offences and crimes that impact in a damaging way on the natural environment, diverse species (human and non-human) and the planet". Green criminology identifies that diverse living things can be sufferers of human damage to ecosystems. Green criminological research thus explores ecological crime, victimization, and justice from various theoretical positions that recognize these distinct sufferers.

The human and natural worlds are mutually dependent and not autonomous; they have always been part of the same global ecology (Potter, 2017). Humans and the social worlds we have built depend on nature. Basically, we all need healthy food to eat, clean water to drink, and air to breathe to stay alive. However, our exploitation of nature in this modern era intensifies natural disasters and causes various forms of environmental harm to humanity, individual victims, social groups, and society (Potter, 2017). Green criminology focuses on environmental harm (White,

2008) and "the analysis of environmental harms from a criminological perspective, or the application of criminological thought to environmental issues" (Potter, 2012a as cited in Potter, 2013, p. 126). These simple definitions centralize the idea that green criminology pertains to environmental problems and that there is something in criminology that can be applied fruitfully to studying environmental harm.

Illegal miners cause a tremendous amount of environmental harm through their operations (Tschakert & Singha, 2007). Green Criminological theory helps identify the harm and damages caused by illegal mining activities. This theory helps examine why miners mine illegally and addresses my research question pertaining to the criminogenic (crime-producing) conditions that encourage them to mine illegally. Criminological concepts such as criminogenic market structure and criminogenic regulatory structure, which refers to the existence of an economic market and regulations that are structured in such a way that inherently influences or encourages criminal behaviour, will be applied to ecological harms. For example, it may be the case that lax environmental regulations and the global demand for minerals encourage illegal mining. It may also be that the practice of illegal mining is a result of the changes in economic and cultural conditions of individuals (poverty), as the result of a shortage of resources, or as a response to their exposure to environmental harms due to the activities of large-scale mining companies in Ghana. The activities of illegal miners affect the environment and all the different species living and surviving on the earth. These concepts will be used to explain the individual or group participation in illegal mining activities.

The human and natural worlds are codependent and cannot be separated. Therefore, any harm caused to the environment affects human life. While applying criminological concepts to the harm done to the environment to allow me to examine the conditions that facilitate ASM's

harm-causing actions, a conceptual framework is also needed to better describe the harm caused to people who live in areas where illegal mining takes place. To itemize these harms, the 1972 Stockholm Declaration will be employed to examine the human rights abuses related to illegal mining.

3.2 1972 Stockholm Declaration on Human Rights

Human Rights – Stockholm Declaration on Human Rights In 1972

The Stockholm Declaration on Human Rights provides a framework for evaluating how the failure to regulate illegal mining in Ghana violates the human rights of those living near the mines. The United Nations Conference on the Human Environment took place from 5 to 16 June 1972 in Stockholm to contemplate the potential to identify common views and rules to motivate and guide individuals in global conservation and improvement of the human environment. This conference was the first-ever UN conference with the word "environment" in the title and began a new period of worldwide collaboration on environmental issues.

The 1972 Stockholm Declaration documents the linkage between human rights and environmental issues (Kiss, 2003; Maggio & Lynch, 1997). This pronouncement provided the first worldwide set of principles for future international cooperation on environmental issues and led to the establishment of the United Nations Environment Program (UNEP). Principle 1 of the Stockman Declaration states that: "Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears solemn responsibility to protect and improve the environment for present and future generations" (Clark, 2009, p. 130). The safeguarding and improvement of the human

environment is a key concern that disturbs the welfare of humanity and economic development globally. The rate of natural growth of the population puts pressure on the environment, and so there is a need for adequate policies and measures to protect the environment. Environmental issues should be a concern and responsibility for all people.

Human rights abuses and green criminology share similar concerns. For example, any damage to the natural environment negatively affects the right to life of any living creature around such an environment. Exposure to fumes comes as a primary harm that damages the environment, affects the fundamental rights of freedom, good conditions of life, and denies one of a quality life. Both approaches would agree that the right to life and dignity is unachievable in a polluted environment. Unrestrained small-scale and illegal mining activities remain a crucial challenge for most African countries.

The Stockholm Declaration of 1972 "is the first document which recognized the linkage between the environment and human rights" (AKYÜZ, 2021, p. 223). This principle emphasizes the connection between human rights and the environment (AKYÜZ, 2021). It stems from the fact that humans cannot exist without a safe environment and therefore corresponds well with research question two on how the failure to regulate illegal mining in Ghana violates the human rights of those living near the mines. It emphasizes the role the environment plays in the aspect of human rights and is, therefore, a useful tool for analyzing the harms of illegal mining activities to the environment.

3.2.1 The 2022 United Nations (UN) General Assembly's Recognition of the 1972 Stockholm Declaration on Human Rights

The 1972 Stockholm Declaration on Human Rights after several decades has been acknowledged by the Human Rights Council and the United Nations General Assembly. In a news publication by the United Nations (UN News) on July 28, 2022, the UN confirmed the right to a clean, healthy and green environment as a Universal Human Right with 161 votes in support and 8 no votes (United Nations, 2022).

In the words of the UN Secretary-General, António Guterres, "the resolution will help reduce environmental injustices, close protection gaps and empower people, especially those that are in vulnerable situations, including environmental human rights defenders, children, youth, women and indigenous peoples". The UN High Commissioner for Human Rights, Michelle Bachele, commended the Assembly for their decision and urged all states to work through collective efforts towards its implementation to avoid an environmental crisis. The right to a healthy environment gaining international recognition will help to ensure a safe environment as people now have the right to demand and not just beg for a healthy environment.

3.3 Research Methodology

Why is the practice of illegal mining so prominent in African countries, especially Ghana? In trying to find answers to this question, I will examine some of the reasons (criminogenic factors) why the indigenous people in Ghana engage in illegal mining and how failure to regulate the sector affects those living near the mines. My goal is to provide an in-depth understanding of the environmental and human harm caused by illegal mining and possible

recommendations for addressing or mitigating the problem, making the qualitative approach most appropriate for this study.

3.3.1 Qualitative Research Strategy

A qualitative research strategy identifies humans as active and innovative and actively negotiating the world around them to create and sustain meaning (Snape & Spencer, 2003). My research questions are best answered through an interpretive method that tries to "explain and understand social phenomena and their contexts" (Snape & Spencer, 2003, p. 5). By examining people's meaning-making, viewpoints, individual feelings, and exposures of their everyday lives to illegal mining activities, I intend to understand the motivations that draw actors into ASM (galamsey), as well as local experiences of victimization caused by ASM. This approach also allows for examination of whether Ghanaians' human rights are abused as a result of the failure to regulate the illegal mining sector, and how they grapple with questions of human and ecological rights. My approach follows the principles proposed by Holdaway (2000), who states there is a need for qualitative researchers to be involved in the perspective of the researched so as to engage with their creation and mediation of meanings for their actions across space and time. This approach will help to capture the complexities involved in the practice of illegal mining activities as well as understand and appreciate the reasons why participants still engage in the act together with how failure to regulate the sector affects their rights as humans.

3.4 Sources of Data

Both primary and secondary sources of data have been used in this research. Primary data refers to the firsthand data gathered by the researcher directly (Ajayi, 2017). Having lived in

a mining town specifically Obuasi and Tarkwa in the Ashanti and Western regions respectively throughout my childhood and worked as a community development officer at AngloGold Ashanti Obuasi and Iduapriem mines, I have had the privilege to interact with several community members who engage in illegal mining activities and experienced life in a mining community. My firsthand data comprised an autoethnographic recounting of my experiences. Considering the COVID-19 global pandemic, its travel restrictions as well as safety concerns at the time of this research, the autoethnographic recounting of my experiences was deemed practical and appropriate.

Secondary data is data that has been previously gathered through primary sources and made readily accessible for researchers to use for their research (Clark, 2013). Newspaper publications, published articles, books, the Internet, and electronic media have been used to complement the primary source of data for this research. Some specific keywords like "illegal mining activities in Ghana," "illegal mining activities in Obuasi and Tarkwa," "effects of illegal mining activities in Ghana," "what influences the practice of illegal mining in Ghana," "what are some of the challenges faced by mining communities in Ghana," "why do community members mine illegally in Ghana," were used to search for specific news outlets. Headlines were read, and ones that aligned with the context of the research were selected.

3.4.1 Autoethnographic Research

Autoethnography, according to Adams, Ellis, and Jones (2017, p. 1), “is a research method that uses personal experience (“auto”) to describe and interpret (“graphy”) cultural texts, experiences, beliefs, and practices (“ethno”)”. Autoethnographers, according to Adams et al,

(2017, p. 1), "engage in rigorous self-reflection – typically referred to as 'reflexivity'" to unravel the connection or connectivity between the "self" and "social life" because personal experience is pervaded with political and cultural norms and anticipations. Autoethnographers aim to unravel the meanings of life endeavors together with how to understand and overcome challenges (Bochner & Ellis, 2006).

Brought up in Obuasi – a mining town in the Ashanti region of Ghana – illegal mining has been something I have always lived with and witnessed. Living in Obuasi since childhood, together with working as a community development officer at AngloGold Ashanti Obuasi and Iduapriem mines, in Obuasi and Tarkwa in the Ashanti and Western regions of Ghana respectively, has given me a great deal of personal experience when it comes to the issue of illegal mining. I have had several interactions and engagements with community members, including several illegal miners (since some are part of and live in the community). I kept notes of some of the interactions I had with these community members, which has served as a source of data for this autoethnographic research. As well, as a community member, with several experiences in mining communities, the secondary source of data incorporated in this research also reflect and have helped me remember many of my experiences as I read through the articles and other publications on this topic.

Repeatedly reading these materials allowed me to refresh my memories of experiences encountered as a community member living in a mining region, as well as my work as a community development officer in this region. I transcribed, compared, described and interpreted these experiences together with data gained from my secondary sources to examine the connection between the self and social life.

A journaling exercise has allowed me to organize my memories and to reflexively interrogate them. The notes I kept in my journal on some of my interactions, activities, and experiences during my work in the mining industry as well as a community member helped trigger my memories. I then coded these memories and notes as well as my secondary sources of data.

Through coding, comparing, interpreting, grouping like items together, and arranging them chronologically and according to themes, my memories were reviewed and organized towards finding answers to my research questions.

3.4.2 Coding

A vital stage in every research project is the analysis of the data as all the data gathered are grouped according to similarities and linkages to arrive at research findings. According to Morse (1994, p. 25), it is "a process of piecing together data, of making the invisible obvious, of linking seemingly unrelated facts logically, of fitting categories one with another, and of attributing consequences to antecedents." Coding is not the analysis in itself but rather a component of analysis (Coffey & Atkinson, 1996). Coding in qualitative research, according to Williams & Moser (2019, pg. 45), "is comprised of processes that enable collected data to be assembled, categorized, and thematically sorted, providing an organized platform for the construction of meaning." It involves developing and applying labels to the themes and topics in textual (or visual) data. Coding, according to Coffey & Atkinson (1996), is a way of ensuring a rigorous review of research data.

Coding methods utilize processes that help to bring to bear the themes embedded in the data and to propose thematic directions to take, through which meanings can be arranged, organised and presented (Williams & Moser, 2019). Employing an open, axial (which is developing the relationship between open codes to develop core codes[Straus, 1998]), and selective coding approach, according to Williams & Moser (2019, p. 47), guarantees a patterned and evolving "data loop" within which the researcher interrelates and continuously compares data, implementing the process of forming associations and data reduction procedures. According to Khandkar (2009, n. p.), "Open Coding includes labeling concepts, defining and developing categories based on their properties and dimensions."

My coding process involved reading through my data (primary and secondary) several times and applying labels that summarized what I saw happening in the data without imposing any initial themes on the data. Applying these labels to each line of the data sentence by sentence is referred to as line-by-line open coding (Khandkar 2009). Line-by-line open coding of the research data helps capture important categories and reduce the possibility of missing a category (Holton, 2007). I engaged in line-by-line open coding with these questions in mind: "'What is this data a study of?', 'What category does this incident indicate?', 'What is actually happening in the data?', 'What is the main concern being faced by the participants?', and 'What accounts for the continual resolving of this concern?'" (Glaser, 1998, p.140 as cited in Holton, 2007 p. 24). This process helped me avoid missing important categories and contributed to the creation of codes that fit the important areas of the phenomenon under study.

Based on this review through line-by-line open coding, a list of possible important substantive themes was generated in relation to concepts from my theoretical framework. After the identification of these themes, an axial coding technique was employed to further improve,

associate, and group these themes (Williams & Moser, 2019). According to Strauss (1998, pg. 109), "axial coding identifies relationships between open codes, for the purpose of developing core codes. Major (core) codes emerge as aggregates of the most closely interrelated (or overlapping) open codes for which supporting evidence is strong". My next approach in the coding process was selective coding, "enables the researcher to select and integrate categories of organized data from axial coding in cohesive and meaning-filled expressions" (Williams &Moser, 2019, p. 52). This is a continuation of the axial coding at an advanced level that further refines the data for an ultimate construction of meaning through selected themes. All these coding processes were carried out with themes derived from my theoretical framework in mind, to help focus my coding on matters related to green criminology, criminogenic conditions, and human rights violations. My observations as well as my experiences of being part of and having stayed in the mining community for several years were included in this review. Secondary sources were similarly reviewed to both confirm and expand upon these themes.

3.4.3 Reflexivity

In social science research, the researcher needs to develop a personal connection with the research process. According to Pillow (2003), reflexivity involves a continuous conscious knowledge of how one's self impacts upon the research process, which helps promote better knowledge creation and more accurate analysis in research. As stated by Davies (2012, p. 4), "reflexivity, broadly defined, means a turning back on oneself, a process of self-reference". This is a way of developing reciprocity with research subjects, according to Pillow (2003). Developing reciprocity, thus, "doing research 'with' instead of 'on'" by means of "hearing, listening, and equalizing the research relationship" (Pillow, W., 2003, p. 179). By this,

reflexivity is employed to reduce the writer's unconscious influence on the writing and research procedure. Employing these reflexive techniques thus doing research "with" instead of "on" according to Pillow (2003) or detailed accounts of the framework of production of this research gives an assurance that it is valid and truthful and that the voice of the subjects has been captured.

Using autoethnography as the primary source of data for my research requires the practice of reflexivity. The reason being that I have been in constant interaction with the research for many years. A review and examination of my memories is an opportunity to reflect on my experiences, which ensures that these narratives are written and understood with the sensitivity to the viewpoint of the researched while empathically working to understand these experiences through the eyes and perspectives of others. Autoethnography invites reflexivity because the researcher knowingly entrenches themself in theory and practice and clarifies a phenomenon under study by way of intimate autobiographic description. The act of reflection is seen as a cognitive activity, in that, it requires a high degree of critical thinking. Constantly revisiting and re-examining my work during the process, contributed to reflexivity with the goals of my research in mind. As Anderson (1989, p. 16-17) writes, "Reflexivity involves a dialectical process among five areas: 1. the researcher's constructs, 2. the informants' commonsense constructs, 3. the research data, 4. the researcher's personal biases, and 5. the structural and historical forces that informed the social construction under study". With the use of the journal that I kept during my work as well as when I was a community member in a mining town, I constantly revisited the journal and questioned my biases based on the data obtained as well as the thoughts from informants (journal). I engaged in the back and forth dialectical process and critical thinking within myself to ensure the credibility of the research findings.

Based on Anderson's (1989) dialectical process, my assumptions and position were interrogated together with that of the researched and data obtained. By so doing, the research is based on the views of the researched, the researcher, and what is contained in the literature.

3.4.4 Rigour

According to Trinh (1991), reflexivity is connected to validity and, in many instances, it is considered a form of scientific rigour. Quantitative research is valued due to its precision and accuracy but, as indicated by Winter (2000), high-level qualitative research is associated with rich and complex outcomes and gives insight into the meanings of social life and specific issues. Questions about rigour, according to Tracey (2010, p. 841), comprise the following: "Are there enough data to support significant claims? Did the researcher spend enough time to gather interesting and significant data? Is the context or sample appropriate given the goals of the study? Did the researcher use appropriate procedures in terms of field note style, interviewing practices, and analysis of procedures?" As a qualitative research inquiry, the findings of this research are rigorous, based on the following reasons: First, the two sources of data employed, primary and secondary, enrich the content of the findings and provided sufficient data from different perspectives by reflecting micro-, meso-, and macro-level engagements with the problems presented by ASMs. Adams et al. (2017) mention that a personal or direct experience with a phenomenon under study gives an insider knowledge and in-depth insight of such a phenomenon. I have been in constant interaction and contact with the researched for years as a community member in a mining town together with my work as a community development officer. I have life experience with the phenomenon under study together with field notes. Employing an autoethnographic approach as the method for this research ensures rigour as it

provides adequate and substantial information about the researched within their socio-cultural context. This produced rich and broad data about the criminogenic (crime producing) conditions or factors that influence Ghanaians to mine illegally as well as how the failure to regulate the illegal mining sector affects the human rights of those living near the mines.

Detailed procedures by which the raw data are worked into the research report are explained above, making certain a rigorous data analysis. This ensures a transparent procedure of sorting, choosing, and organising the data. Repeatedly reading the data obtained so as to be immersed in the data and become familiar with the data will also ensure rigour to this study.

CHAPTER FOUR

ANALYSIS AND DISCUSSION

Drawing on concepts discussed in chapters two and three, this chapter presents the analysis and discussion of the data. An autoethnographic recounting of my experience as a community development officer at AngloGold Ashanti Obuasi and Iduapriem Mine (Tarkwa) as well as a community member in a mining town (Obuasi-Tutuka) since childhood together with news publications and articles are employed in this chapter. These sources help unravel the criminogenic conditions that influence the practice of illegal mining in Ghana, along with how the failure to regulate the illegal mining sector violates the human rights of those living near the mines. Some concepts like criminogenic market structure, criminogenic industry structure, criminogenic regulatory structure, inadequate job opportunities, and poverty are used and applied to ecological harms in this analysis.

4.1 Some criminogenic conditions that influence Ghanaians to mine illegally

Crime is not perceived as a consequence of naturally wicked people by green criminologists but rather as a result of several societal conditions and how society manages its economy and scarce resources (Hall & Farrall, 2013). According to Hall and Farrall (2013), societal crime is a result of how society manages its inadequate resources and imbalances regarding goods and services. This means crime in society is a result of not having access to some services or challenges and conditions that one faces in society.

4.1.1 Criminogenic Regulatory Structure

i. Compensation

The Ghanaian constitution is the principal legal framework that outlines the ownership of land and minerals in the country. Several government institutions and agencies like the Environmental Protection Agency (EPA), Chamber of Mines, Lands Commission, and the Forestry Commission, exist to regulate the mining sector in Ghana.

Aside from the constitution, there are several regulations and legislations such as the Mercury law 1989 (PNDCL 217), the Minerals and Mining Act 2006 (Act 703), the Environmental Protection Agency Act 1993 (Act 490), and the Environmental Assessment Regulation 1999 (LI1592), which exist to promote and guide the extraction of minerals in the country as well as regulate the mining sector.

By the Constitution of the Republic of Ghana, minerals found in any land are entrusted to the president on behalf of the people of Ghana (Okyere, et al., 2021). Article 257, section 6 of the 1992 constitution, as well as section 1 of the Mining and Minerals Act 703 (2006), describe minerals as belonging to the state. It reads:

> Every mineral in its natural state in, under, or upon land in Ghana, rivers, streams, water courses throughout the country, the exclusive zone and an area covered by the territorial sea or continental shelf is the property of the republic and is vested in trust for the people of Ghana.

The above quote implies that any mineral right on any land requires a license or lease to be approved by the Minister responsible for mines. However, “the rights of the mineral rights holder to the exploitation of the minerals on the concession is subject to the surface rights of the owner

or lawful occupier of the land and any other limitations that may be reasonably determined by the Minister" (Niber, n.d., p. 16). This, therefore, requires a surface right compensation to be made to the lawful occupier of the land. The Minerals and Mining Act, 2006 Act (703) and State Lands Act, 1962 (Act 125) make room for payment or compensations to be paid to affected farmers; however, according to Darko (2017 p. 12), "the Administration of Lands Act (ACT 123) stipulates that royalties and rents be paid annually to traditional leaders who own lands as a form of compensation".

According to Niber (n.d.), before Act 703, the Minerals and Mining Law 1986 (PNDCL 153) governed mining companies' activities for over 20 years until its repeal in 2006. Unlike Act 703, guidelines for determining compensation due to a lawful occupier of land were not provided in PNDCL 153. Act 703 (74) 1 states some guidelines upon which compensation may be entitled "(a) deprivation of the use or a particular use of the natural surface of the land or part of the land, (b) loss of or damage to immovable properties, (c) in the case of land under cultivation, loss of earnings or sustenance suffered by the owner or lawful occupier, having due regard to the nature of their interest in the land, (d) loss of expected income, depending on the nature of crops on the land and their expectancy".

Though the compensation of farmers is based on legal foundations, Ayee et al. (2011 cited in Darko, 2017, p. 12) note that there is much confusion and variability regarding a fair and suitable package that has rendered "compensation processes to negotiations between concerned stakeholders (affected parties and mining companies)". Some mining companies, however, disregard these requirements and deal with the traditional leaders of the land and not the affected farmers, whereas others who otherwise adhere to the law pay amounts that are insufficient to sustain these farmers (Arezki et al., 2013, cited in Akadzaa & Darimani, 2001). These farmers

are only entitled to the farm produce (surface rights) on the land and compensation packages are calculated based on specific rates assigned to each type of produce.

During my work as a community development officer, farmers were compensated for crops when their lands were affected by mining activities. Crops on the land were counted and multiplied by the rate per charge of each crop, with the total being the compensation package for each farmer. This meant there was no compensation for uncultivated or fallow land. In a scenario where a farmer has cultivated a piece of land and was waiting for the land to recover before starting another cultivation, the farmer lost their land for the period and the land was ineligible for compensation since there were no crops or properties such as buildings on the land. Most people in the rural areas of Ghana are farmers, and they rely on farming to support their families.

Gyan (2019), in research on small-scale mining and its impact on rural livelihoods and health in Prestea, Ghana, reveals how community members engage in galamsey activities as a result of losing their lands to larger mining companies. A research participant in a focus group discussed how her husband's land, which was given to him by his father, was taken away ("sold by the chief or government authorities") by some large-scale mining company, rendering him jobless and with no source of livelihood; he resorted to illegal mining to provide for his family (Gyan, 2019, p. 46).

During most of my interactions with illegal miners during my work and as a community member in a mining community, several complaints about losing land due to large-scale mining activities were heard. I remember one young man who complained bitterly about how the land on which he worked as a farmer was taken away from him with very little compensation given. He complained about how the compensation given to him could not sustain him and his family and

how he is being forced to engage in illegal mining activities to be able to provide for himself and his family since there is no land for him to cultivate.

ii. Registration process

During my work as a community development officer, community fora and Community Consultative Committee (CCC) meetings were held with all the mine catchment communities. The CCC meeting comprised community leaders and chiefs, whereas the community fora involved everyone in the community. These meetings served as a platform for peaceful and fruitful monthly interaction between the mine and its catchment communities. Grievances were also aired as well as community requests during these meetings. Vital information, education, and resources were discussed with community members at these times.

The practice of illegal mining in Obuasi in 2014 had turned brutal and such meetings were used as a channel to educate the youth on the effects of illegal mining on their health, the community, and the environment. I remember vividly the year 2014, when the mine was attacked by illegal miners in Obuasi, locking all workers up in their offices, including myself, until night when the police and military intervened. That day, any unfortunate mine worker who was spotted outside the mine and in the community was attacked as well, and mine vehicles were vandalized. Small-scale mining, or galamsey during the colonial era as the name depicts, was very friendly where miners gathered minerals and sold them, but the practice of galamsey after the colonial era, when mercury was legalized in 1989 for its usage in the sector to now have become very deadly and unfriendly. People migrated to Obuasi from other regions to engage in galamsey

activities. Illegal miners walked into the community openly with cutlasses and other weapons, scaring community members.

Community members were sensitized on various processes and resources regarding how they could collectively come together to obtain a legal concession to mine without any trouble from mining companies, the military, or the police. By so doing, their activities would be monitored to reduce their adverse impact on the environment and the community. On several occasions, members complained that the bureaucracy and fees involved in the registration discouraged them from going through such a process. One community youth who was standing closer to me during a community forum at Tutuka said the following in the local dialect "Akan-Twi":

> Madam, when you visit their office, there are numerous bureaucratic activities, and our educational level is too low to keep up with them. We are also required to pay huge sums of money which we do not have. So we have no option but to sneak into AGA's concession to mine in order to provide for our families.

Galamsey in Ghana was seen as an informal sector before the 1980s because there were no government institutions to regulate the sector (Hilson & Clifford, 2010; Kumah, 2006, as cited in Gyan, 2019). This drew many people into the sector ((Aryee et al., 2003, as cited in Gyan, 2019). Institutions, including the Minerals Commission and the Environmental Protection Agency, were created alongside the ratification of legislations like the Ghana Minerals and Mining Act of 1986 (PNDCL 219) and the Small-scale Gold Mining Law of 1989 (PNDCL 218) from the 1980s to regulate the sector (Gyan, 2019). In this way, legal registration with the Minerals Commission is required to engage in small-scale mining in Ghana. Hilson and Potter (2003) note that even though the application process for the registration of small-scale mining is accessible, about 85%

of Ghana's small-scale mines do not obtain official licensing, and this is likely due to the cumbersome process one must go through to register, as well as the cost of capital involved in registering (as cited in Teschner, 2012). Awumbila and Tsikata (2004) likewise suggest that the process of obtaining a mining license to mine on a small scale in Ghana restricts several people from mining legally.

Gyan (2019) mentions five stages a firm or an individual goes through before acquiring a permit to mine. The first is the prospecting stage, where the group of people or individuals interested in mining on a small scale go in search of land to locate the resource (s). This is followed by the second stage, which is the exploration stage, where drilling takes place on the selected land to determine the location of the resource. The exploitation stage is next, and is when the group or an individual can go ahead and mine or exploit the resource. There is the fourth stage, which is the developmental stage, where the site is set up for mining purposes, then reclamation, which is the last stage, where land is reclaimed after mining activities are completed. Gyan (2019) also notes that to be able to acquire a concession to mine, one also needs documentation that shows the concession and where it is located, that is, the district and the region; also, the land needs to be registered for the approval of a licensed surveyor before any activity can be carried out on it. However, in all these processes, there is the first-come-first-served policy, in that anyone who can register a land first and has legal documents becomes the legal owner of the land (Gyan, 2019). This means that more than only one person may be interested in a particular land, so the fittest survive in this battle.

Wireko-Gyebi et al. (2020), in their analysis of data from a focus group discussion and key informant interviews in Ashanti and Western regions of Ghana, also report that cumbersome and expensive licensing procedures are one of the main reasons why people engage in illegal

mining in Ghana. During their focus group discussions and key informant interviews, it was revealed that the process starts with acquiring a prospecting license from the Minerals Commission. There is a manual prospecting by a geologist, following a preparation of a site plan by a surveyor. The site plan is then taken to the district office of the Minerals Commission to ascertain the accessibility of the site. Before then, one has to purchase a form with a banker's draft before the accessibility process begins. A 21-day publication or advertisement is made, then a consideration fee is paid to the Environmental Protection Agency (EPA) for an Environmental Impact Assessment (EIA) to be carried out if no objections are made by anyone during the 21 days of publication. According to Wireko-Gyebi et al. (2020), the process narrated above is the first phase of the licensing process. Following this process begins phase 2 in Accra at the National Office of the Minerals Commission. For phase 2, as stated by Wireko-Gyebi et al. (2020, p. 5),

> The first step in Accra is to pay a processing fee for the assessment of all collated documents after which a letter of consideration is taken to the Administrator of Stool Lands to make payment. Proof of payment to the Stool Lands is taken to the National Office of the Minerals Commission for an agreement to be drafted between the applicant and the state. After the signature, the agreement is taken to the high court for authentication and then to the Lands Commission for registration and documentation. The applicant after all these activities returns to the District Office of the Minerals Commission for a digging permit which is then taken to the District Assembly for a District Operational Permit, and finally, payment is made for stickers to be embossed on the machines for the mining operations.

The table below gives details of the approved payments for small-scale licenses in Ghana based on fieldwork in April 2017. (Exchange rate: 1 US$ = 4.29 GH₵).

Table 3: Approved payment for small-scale mining licenses in Ghana

Process	Cost (GH₵)	Cost (US $)
Purchasing of forms	280	65
Process Initiation	250	58
Consideration fee for Environmental Impact Assessment	1000	233
Certification	5000	1,163
Processing fee	550	128
Stool Land Administration	375	87
Digging Permit	1,400	326
District Operational Permit	5,000-10,000	1,163-2,326
Machine stickers	1,000	233

Source: Wireko-Gyebi et al. (2020 p. 5).

This process is time-consuming as it can take up to two years with a total cost of between GH₵10,000 (US$ 2,326) to (US$ 3,488), equivalent to GH₵15,000 per the 4.9 GH₵ to 1 US$ exchange rate (Wireko-Gyebi et al., 2020). Some key informants informed that for one to expedite the application process, one can end up paying about GH₵50,000 (US$ 11,628) (Wireko-Gyebi et al., 2020). Using the current World Bank cedi equivalent rate to the US dollar as of January 21, 2024 (1USD = 12.4 GH₵), an average Ghanaian needs GH₵28,842.4 (US$

2,326) to GH₵ 43,251.2 (US$ 3,488) to go through the approved licensing process to obtain a license to mine.

Thinking deeply into the above process, the information gained from some of these illegal miners and youth in the community during my community forum sessions, and the above-approved payments for obtaining small-scale licenses, it is obvious that the average Ghanaian will not be able to keep up with all these payments and processes and will, therefore, be pushed to mine illegally.

4.1.2 Criminogenic Market Structure

Gold was the first metal known to humans and has been considered a valuable commodity for the past 5000 years of human history (Butt & Hough, 2009). Its "importance as a unit of exchange and store of wealth drove technological and scientific developments" (Butt & Hough, 2009, p. 277). I can still remember the excitement on my face the first day I held gold in my hand during a visit to AngloGold Ashanti's underground mine. At that time, all I wished for was to be asked to take it home, but that was impossible. The bright yellowish unique shine around this metal and the feeling of prestige, wealth, and power that comes with it is spectacular. This metal has great importance, including its use in electronics, jewelry, dentistry, space exploration, finance, aerospace, investment, and medicine. According to Schenk (2013, p. 1), "Gold has acted most consistently as a store of value and this has generated a highly developed global market in gold and in gold derivative products".

A branch of Diamond Marketing Corporation (DMC) known as the Precious Mineral Marketing Corporation (PMMC) is a state-owned company mandated to sell and buy gold from

miners in Ghana (Aryee et al., 2003, as cited in Gyan, 2019). The Precious Mineral Marketing Corporation was set up by the Precious Mineral Marketing Corporation Law, 1989 (PNDCL 219) to support the growth of small-scale gold and diamond mining in Ghana as well as procure or buy their proceeds either through a licensed dealer or directly (Coakley, 2003). However, Teschner (2012) informs us that gold mined in Ghana goes through the hands of several dealers, middlemen, and exporters. According to Tsikata (1997), Ghana Consolidated Diamonds Limited (GCD) was allowed to sell diamonds via external selling companies aside from PMMC in 1992. This liberalization of the market was intended by the government to allow private persons other than PMMC to participate in the selling of diamonds and gold supplied by small-scale miners (Tsikata, 1997). Private licensed gold buyers who are officially recognized and the Precious Mineral Marketing Company (PMMC) belonging to the Government of Ghana buy gold from both registered and unregistered (galamsey) miners together with several illegal middlemen (Teschner, 2012).

Teschner (2012) mentions that though there are clearly outlined ways to be able to identify registered and unregistered actors in the sector, laws regulating gold transactions in Ghana state that "a person shall be presumed to be lawfully in possession of gold until the contrary is proved" (Ghana, Government, 1989a as cited in Teschner, 2012 p. 311). This means that everyone (both registered and unregistered miners) can trade gold to formal agencies that offer them good prices without any fear or stress. Some illegal middlemen or middlewomen, especially in remote areas, buy gold from miners who are not able to travel to the big cities to trade. I say illegal because Ghana's laws allow a gold sale to only PMMC or legal gold dealers. According to Teschner (2012), PMMC and these licensed gold dealers only buy smelted gold chips (gold that has been refined to remove all the impurities). These miners in these remote

areas do not have the means or the capacity to go through the process of smelting and, therefore, sell partially refined gold or gold dust to these middlemen, who in turn gather them to the quantity that can go through the smelting process to be able to sell to licensed buyers.

Teschner (2012) shows that PMMC is frequently undermined by these private gold buyers due to their competitive high prices offered in the market to miners. He cites an example of one private gold buyer called Alimex in Tarkwa in the Western Region of Ghana, sponsored by a Lebanese man. Alimex offers competitive prices in the market and smelting services to miners whereby gold dust is refined before sale. Teschner (2012) discovers an informal arrangement between Alimex and PMMC whereby Alimex is required to sell two kilograms of gold every week to PMMC at the PMMC advertising price (which is obviously lower). There were no legal requirements for such arrangements, and therefore, it is intended to help PMMC survive amid the competition in the market as well as save Alimex's dominant position in the market (Teschner, 2012).

During my work as a community development officer, I wondered how these miners in these remote areas could sell the gold they mine in a day to return home with money to feed their families or engage in luxurious activities in the communities. I say this because some of these miners explained in conversation that they do this to provide for their families due to the loss of land they used to cultivate to feed them, while others do this for quick money to enjoy themselves. Whenever you ask them why they don't save, they reply, "Madam, this work we do is very scary, and therefore, when we come home with the money, we have to spend it all because we might go tomorrow and never return". Some were frequently seen at beer bars lavishing money on friends and women. An economic market exists for them to sell their proceeds anytime they engage in illegal mining activities. Such a market fosters this criminal

behaviour of mining illegally. If such a market, especially middlemen, never existed, they would not have been able to sell the gold mined because they cannot keep up with the smelting process to be able to sell to legal buyers.

4.1.3 Lax regulations/ weak enforcement of illegal mining policies in Ghana

Lack of effective law enforcement has been blamed for Ghana's small-scale mining sector (Hilson and Potter, 2003; Hilson, 2002b; Kuma and Yendaw, 2010; World Bank, 2008 as cited in Teschner, 2012). Illegal mining activities have become "alegal" or intentionally tolerated, making its practice very common in both rural and urban areas of Ghana (Blunch et al, 2001, 15 as cited in Teschner, 2012 p. 312). Obuasi and its surrounding townships were among the areas where illegal mining was practised. As noted earlier, in 2014, AngloGold shanti mine Obuasi was attacked by illegal miners, who locked all workers in their offices until the intervention of the military and police. Small-scale mining used to be amicable during the colonial era where miners gathered gold and sold peacefully. Recent practise of galamsey has become extremely dangerous. Illegal miners roamed about in the community openly carrying cutlasses and dangerous weapons, threatening the safety of community members. They dug holes linking to the mine's underground operations, attacking workers underground and making away with the ore that had been retrieved by the mine. I remember there were several occasions when illegal miners showed up as soon as the mine blasted the ore underground, attacked workers, and made away with the ore. Several workers lost their lives as a result of these attacks, with others injured. Several machines and equipment at the mine's underground facility were damaged causing the mine several losses. According to the vice president sustainability's report that year, the country's weak currency, inflation, and lower international gold, coupled with the attacks

from illegal miners at the time, caused a necessary shutdown of the mine in 2014. Based on this report, one would think that illegal mining is legal because of how it was practiced openly, regardless of all the laws governing its practice.

According to management, this temporary shutdown was necessary to kick start a redevelopment phase of the concession that would see greater use of machinery over human labour to extend the mine's life span. Several workers, including myself, were affected by this restructuring exercise and made redundant, with severance packages paid according to the number of years worked. Obuasi Mine transitioned to a Limited Operating Phase (LOP) at the start of 2015 after underground production operations were officially halted in the 2014 year-end. The main elements of the LOP included: (1) a care and maintenance program for the present operational infrastructure; (2) continuing with the expansion of the Obuasi Deeps Decline (ODD), which is located at the southern end of the mine and designed to extend to a depth of about 1,500m and an exploration drilling program to increase the mineral resource confidence; (3) developing and securing approval of the Second Amendment to the Program of Mining Operation (APMO) from the Government of Ghana; (4) completing and submitting the Feasibility Study to the AGA Ltd Board for investment approval; (5) shut down and reconstructing select plant and facilities; and (6) finalizing the historic Diewuoso tailings spillage clean-up project that is targeted to yield a 2015 budget of c.40koz annual production. The Obuasi Deeps according to Salifu et al. (2013, p. 5), refers to the “deep-level ore deposits at Obuasi”.

I was reemployed in June 2015 as one of the few LOP staff. In the first quarter of 2015, the illegal miners (galamseyers) escalated pressure on the mine for access to land closer to the mine's underground operations. Their demands grew further at the end of January 2016 when they began repeated attacks on the mine boundary fence. This situation was worsened when the

government withdrew the military from the site without notice or reason provided to the mine leadership. As a result, on February 6, 2016, the mine suffered the unfortunate loss of Mr. John Owusu, Communications Manager, who was fatally injured in an ambush by "galamseyers". The mine leadership, the police, and the media had visited the area to assess the state and extent of incursions by illegal miners before the unfortunate incident happened. Mr. John Owusu did not survive his injury and lost his life a few hours after being rushed to the hospital. This incident left everyone in the mine speechless and sad, considering the direction in which illegal mining activities were heading, placing all our lives and that of community members at risk. Community members were also not safe because these illegal miners used alcohol and other drugs and therefore posed a threat to community members. As a member of the community who lived at Tutuka, I noted that theft and other criminal activities increased in the community. Children who left home for school were seen at Galamsey sites engaging in illegal mining activities to the detriment of their health and well-being. There were several occasions where I spotted community members I knew at galamsey sites. My life was also at risk. Galamsey mining in Obuasi had turned brutal after 2014, and government security agencies' involvement in curbing the threat was below expectations. Galamsey mining had changed for the worse.

Commenting on the practise of galamsey in Tarkwa, a major town in the western Region of Ghana, Teschner (2012) notes how Galamsey miners openly engage in their activities without fear, making one believe that its practice is not illegal. Teschner (2012) mentions how police officers are spotted everywhere in Tarkwa enforcing traffic laws and issuing fines to offenders and asserts that the police would not need much effort to enforce the same actions on these informal miners. Before one enters the township of Tarkwa, several galamsey pits and sites by the roadside are highly visible. Their activities are highly visible, yet it is an illegal practice. Joy

FM (2009), in some of their news articles, has exposed several incidents of police officers protecting illegal miners; also, an underground investigation conducted by Al Jazeera in 2011 revealed several corrupt officers in the police force (cited in Teschner, 2011). These law enforcement bodies have allowed several of these miners to operate without mining permits and in violation of several environmental regulations contrary to the small-scale mining laws in Ghana.

Corruption, "the abuse of public office for private gain" (Kolstad & Wiig, 2009, p. 522) or "the exploitation of bequeathed power for private gain" (Ofosu-Peasah, 2021, p. 3), is one of the main factors that inhibit the enforcement of small-scale mining laws in Ghana. According to Ofosu-Peasah (2021, p. 3), corruption undermines "good governance, social inclusion, economic development, trust and aggravates poverty, inequity, and environmental problems". As noted in Chapter Two, corruption is still an overwhelming issue in Ghana (Asomah, 2023). Political parties are often formed by groups of friends whose primary interest lies in embezzling public funds rather than addressing public needs (Asomah, 2023). The issue of illegal mining became a serious concern in February 2017 when the Environmental Protection Agency's (EPA) Director of Natural Resources warned that Ghana would import water if Galamsey activities were not checked (Ofosu-Peasah, 2021). This brought about a by Citi FM's **"#StopGalamseyNow**" campaign and the establishment of the Media Coalition Against Galamsey (MCAG) in April 2017 (Ofosu-Peasah, 2021, p. 10). According to Ofosu-Peasah (2021, p. 10), the **"#StopGalamseyNow"** campaign had the following five goals:

> First, a halt in galamsey for six months. Second, a cessation in new mining licence issuance for a year. Third, it demanded a re-categorization of small-scale mining activities to reflect the current use of heavy-duty equipment. Fourth, allow the

> regeneration of polluted water bodies. Fifth, reclamation of lands destroyed by illegal mining. Similarly, MCAG's objective was to embark on public education on the adverse impact of unsustainable mining practices and an end to Galamsey.

According to Ofosu-Peasah (2021), several successes in the campaign were achieved, including a ban on small-scale mining in April 2017, the set-up of a security task force known as Operation Vanguard in July 2017 to combat galamsey, as well as an Inter-Ministerial Committee on Illegal Mining (IMCIM) in 2018. Operation Vanguard arrested over 1000 illegal miners and seized illegal mining equipment; however, Ofosu-Peasah (2021) found several news reports of corrupt activities by some state leaders. About 500 ceased illegal mining excavators went missing and a bribery allegation was made against the then secretary of IMCIM (Ofosu-Peasah, 2021). I know excavators are huge machines; one will marvel at how these excavators went missing without a trace.

A similar incident occurred in Obuasi during my stay in the community and while working at AngloGold Ashanti Mine. In 2016, the vice president for sustainability, Kelepile Dintwe, in his first quarter sustainability report, stated how illegal mining in Obuasi has become emboldened by the inaction and apparent lack of willingness by the government of Ghana to intervene with appropriate measures. Illegal miners in Obuasi at the time mounted pressure on the mine with repeated attacks on the mine's boundary fence for access to the mine's security-critical areas. Unfortunately, the military on-site managing the situation was withdrawn by the government without notice or reason provided to the leadership of the mine. There were several instances where arrested illegal miners were released with reasons that a call was received from higher authorities for their release. As mentioned by Ayee et al. (2011, as cited in Teschner (2012 p. 312), "Ghanaian politicians are not known for this type of audacity and mining reforms

are continually stifled by the dominance of the president and MP's tendency toward party loyalty". Governments and politicians are widely regarded as having failed in their attempts to regulate the sector due to the potential profits they have to gain (Teschner, 2012). Politicians, due to the political support they know this informal sector can provide them, are not able to enforce most of the small-scale mining laws to ensure the effective management of the sector for enhanced environmental and human protection.

Illegal mining has become a political campaign for politicians to win the support of the youth and a campaign message to castigate ruling parties (Teschner, 2012). This is also evident in several "galamsey expose" videos by Anas Aremayew, an investigative journalist and an undercover reporter in Africa, specifically Ghana, circulating on social media and showing how leaders and other officials stand to benefit from illegal mining activities. Some of these leaders accept bribes to protect and give access to illegal mining, which has resulted in the recent dismissal of a Minister of State from the Finance Ministry in Ghana.

4.1.4 Poverty

On several occasions, the issue of poverty has been the major reason for the youth's engagement in illegal mining activities during most of my engagement sessions with the community. All efforts to sensitize youth on the consequences and effects the practice of illegal mining has on the environment and their lives proved futile. Many a time, the response I received from them was, "Madam, you have a job that pays you every month, so you don't understand what we are going through and what it means to wake up every morning not knowing what you will eat or how to feed your family". This is confirmed by Aryee, et al. (2003 p. 131) that small-

scale miners are “poor people; individuals or small groups who depend upon mining for a living; who use rudimentary tools and techniques (e.g. picks, chisels, sluices and pans) to exploit their mineral deposits”. Truly, I do understand the hardship they go through and how they are pushed to engage in galamsey activities to be able to feed their families. However, there should also be a concern about the detriments to their health and the environment.

A BBC Africa Eye documentary by BBC News Africa on YouTube confirms a similar situation of how poverty pushed a young kid named Justice to drop out of school to engage in illegal mining in search of money to provide for his family and himself (BBC News Africa, 2020). Justice explains that his parents are divorced, and he needs to care for his aged father and brother so he does not end up as an illegal miner like him. According to Justice, their illegal mining activity takes place in a ghetto that lies on the edge of a 145 square km lease controlled by a foreign-owned company in Ghana named Bogoso Gold Limited. He narrates how life in the ghetto is hard, coupled with lots of bullying and hard work. He worked as a locum boy (transporting the ore from the pit to the surface) and later graduated to join the pump operators. Justice is from a poor background and needs to do something to succeed. He later opened a clothing shop from the little money he could save and stopped the galamsey business.

One day, on my way to Diawuoso for a community forum as part of my community development duties, I spotted one of my Junior High School (JHS) mates from Anamon Hyeren Standard School at a galamsey site. We stopped the car to engage him in a conversation, but my mate took off upon seeing me. It’s been a while since I saw Marizuu, and therefore I decided to visit him after work. On reaching his house, Marizuu explained the hardship and difficulties his family had been going through and stated that he had no choice but to engage in illegal mining activities to be able to support himself and his family. He added how he couldn’t further his

education after we all completed JHS due to insufficient funds and, therefore, did not have any certificate or expertise to engage in any business. I was quiet at that point because I went to his house to sensitize him on the effects of illegal mining on his health especially, but I couldn't speak because, putting myself in his shoes, one would ask how his family would be fed if he stopped. I still went ahead and tried to sensitize him, and he promised he would refrain from the act after gaining some capital. I met him again some months later and he informed me of how he has been able to put up a four-bedroom house to accommodate himself and his family (parents and siblings). He also started a small business for himself and no longer engages in galamsey activities.

Oduro and Aryee (2003 p. 23) inform of how extreme poverty is rising in Ghana. In their definition, extreme poverty is defined as being "unable to meet their minimum nutritional requirements even if they devote their entire budget to food". Above 25% of Ghana's population could not meet their basic nutritional needs in 1998/99 (Oduro & Aryee, 2003). Poverty in Ghana is seen as a rural problem in that 59% of people residing in the rural savannah areas were seen as extremely poor compared to 2% of those living in the capital of Ghana, Accra (Oduro & Aryee, 2003). They linked the highest poverty rate to food crop households, with the lowest rate to formal employment households. Agricultural or food crop communities have the highest rate of poverty in Ghana. Agriculture is a vital economic sector for Ghanaians as it offers a source of livelihood for almost half of the population. Ghana is endowed with abundant natural resources and vast agricultural lands that are instrumental to its development. However, it remains heavily reliant on foreign aid and is confronted with overwhelming ecological challenges as its economic growth relies greatly on natural resources (Duncan, 2020). Galamsey mining is commonly practiced in Ghana's rural areas, confirming poverty's linkage to food crop households by Oduro

& Aryee (2003). The more significant part of the youth in these areas engage in illegal mining activities as a source of livelihood, especially families who have lost their lands to mining activities. Poverty makes people susceptible to small-scale mining, whether legally or illegally, to earn a source of livelihood (Opoku-Ware, 2010, cited in Gyan, 2019). Poverty, therefore, turns out to be a push factor in the engagement of illegal mining activities in Ghana.

2.1.5 Inadequate Employment Opportunities (Unemployment) / Education

According to Gyan (2019), unemployment is the state by which an individual willing to work cannot find a source of income through suitable employment opportunities to afford quality health services and livelihoods. Gyan (2019), in his field research at Prestea in the Western Region of Ghana on the impact of small-scale mining on the health and livelihood of community members in the area, learned in a focus group discussion and interviews with 26 participants comprising stakeholder officials (Lands Commission, Minerals Commission, and Prestea government hospital), Community members, and small-scale miners that the issue of unemployment is a major motivator for the practice of illegal mining activities. According to Gyan (2010, p.39), Philip, one of the participants who is a graduate and a miner, stated:

> After graduating from the university, I have been trying to secure some job to help cater for myself but to no avail. And you know I cannot depend on my parents any longer at my age. I should be able to fend for myself and even cater for my parents. So Augustine (researcher), your brother (referring to himself) have to do small-scale mining to survive.

Rufai N. A (2022) also reports on the issue of unemployment from Accra- Ghana on South African Broadcasting Corporation (SABC) News on YouTube. According to Rufai's report, youth unemployment in Ghana is 10 percent according to the World Bank. However, nearly 50 percent of the youth cannot acquire jobs that utilize their potential or can create employment opportunities for themselves. Rafai (2022) further informs that the World Bank has urged the government of Ghana to set up programs that add new skills needed by employees and as well review all its programs targeting youth employment.

Joy News Prime, commenting on the 2022 Ghana Statistical Service data on youth unemployment, informed that there has been an increase in the youth unemployment rate from 19.5% in the previous year to 25% in the reporting year (2023). This report by Joy News on YouTube revealed that the bulk of this group (the unemployed) are neither in school nor in any form of training. Over 1.7 million Ghanaians are unemployed, making it very difficult for them to find a source of income to be able to cater for their basic needs like food, water, and shelter. They are multi-dimensionally poor, signifying a key threat to the country's national security. According to the Ghana Annual Household Income and Expenditure Survey released by the Ghana Statistical Service covering the year 2022, two out of these three unemployed Ghanaians are females. Dr. Patrick Asuming-Snr. Lecturer in the Department of Finance at the University of Ghana, in a Zoom meeting interview by Joy News, informs that this data released by the Ghana Statistical Service signifies a weak labour market and, therefore, requires further digging into underlying relations and patterns for effective policy interventions.

I chanced on another disheartening and heartbreaking video on a YouTube program called YAWA of the DAY by Kwadwo Sheldon on the issue of unemployment in Ghana. Nurses who had completed their nursing training and were waiting for work placement were lamenting

and crying profusely about how they had not been posted for two years (Sheldon, 2023). One nurse narrated how private hospitals are unwilling to employ them because they claim they will leave the job after their successful work placements. She narrated how most of them could complete their nursing training with loans they would have to pay back and have families they have to cater for but have no source of income. She, therefore, called on the Ministry of Finance and the Ministry of Health for their assistance. Women make up about 50 percent of the small-scale mining labor force (Hilson, 2001as cited in Teschner, 2012). This also demonstrates how this sector is involved in the use of women and children.

These are Ghanaians who have successfully attained some level of education and yet are unemployed. The uneducated lament inadequate jobs, whereas the educated also face the same. Kwadwo Sheldon encouraged the youth not to always wait on the government but to be innovative and find alternative sources of livelihood.

Robert Merton (1957) in his strain theory explains that society has cultural goals that are universally deemed desirable and institutionalized means or accepted methods to achieving these goals. However, some individuals in society are hindered from attaining these objectives through lawful means. This situation puts pressure on such people to deviate. There are different ways by which people react to situations in life. The table below helps explain Merton's (1957) five different modes of adaptation:

Table 4: Robert Merton's five different modes of adaptation

Modes of adaptation	Cultural goals	Institutionalized means
Conformity	Accept	Accept
Innovation	Accept	Reject
Ritualism	Reject	Accept
Retreatism	Reject	Reject
Rebellion	Reject prevailing goals and means and substitute new ones.	

Source: Adapted from Robert Merton, Social Theory and Social Structure, Rev. ed. (New York: Macmillan 1968) cited in Merton (1957 p. 163).

As reported by Merton (1957), those who conform accept the societal cultural goals and strive to attain the endorsed methods prescribed by society to attain them. The innovators will accept the societal cultural goals but resort to illegitimate means. Ritualists reject cultural goals but accept the approved means, whereas retreatists reject both the cultural goals and means. The rebels, which are the last group, reject both the cultural goals and institutionalized means and substitute their own. Agreeing with Merton (1957), individuals who embrace the cultural goals while spurning the institutionalized means are more prone to engage in delinquent behavior.

Linking Merton's (1957) strain theory to the inadequate job opportunities in Ghana, as well as Kwadwo Sheldon's advice for youth to be innovative and find other means of survival, some of the youth will wait and find other legitimate means for example by selling some petty products to be able to support themselves and their families until they are posted to work. Others

will also resort to illegitimate means to achieve their goals. I witnessed several of these instances, some of which were my schoolmates who got involved in illegal mining activities to obtain a source of income. My brother-in-law's (my younger sister's husband) brother, who was a trained nurse awaiting to be transferred to his station to work, got up one morning to work at a galamsey site for a source of income while awaiting his posting, but unfortunately for him, he never returned home. The pit collapsed, and everyone in it died.

One Ghana TV (2023), in a report on YouTube, "Obuase: soldiers clash with the youth as over 200 illegal miners trapped underground," indicated an encroachment of illegal miners into AngloGold Ashanti's underground facility to engage in illegal mining activities due to the unemployment rate in the community. A youth interviewed revealed the same issue of unemployment as a push factor for him to engage in this activity. He reported that he took a loan to further his education. After school, he has not been able to secure any job to pay back the loan to the bank, so he has no option but to engage in illegal mining activities to get something to feed himself and pay for the loan. Several also claimed that AngloGold Ashanti Obuasi Mine has a workforce with almost more than half being outsiders (they are not indigenes from Obuasi). Most of the workers are from outside Obuasi, depriving them as community members who face all the effects of mining activities in the community access to work in the mine. They cannot starve themselves and their families and, therefore, will have to engage in illegal mining activity to be able to survive.

Several youth in the country lack the needed training and skills to work in the higher offices of some of these mining companies. Those who can achieve some level of education also do not have access to employment opportunities. These factors, together with the inadequate

employment opportunities in the country, push some individuals to engage in illegal mining as an alternative source of livelihood.

4.2 How does the failure to regulate illegal mining in Ghana violate the human rights of those living near the mines?

The Stockholm Declaration of 1972 documents the linkage between human rights and environmental issues (Kiss, 2003; Maggio & Lynch, 1997). According to Principle 1 of the Stockholm Declaration, "Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears solemn responsibility to protect and improve the environment for present and future generations" (Clark, 2009, p. 130). This Declaration on Human Rights has been acknowledged by the Human Rights Council and the United Nations General Assembly. The UN confirmed the right to a clean, healthy, and green environment on July 28, 2022, as a Universal Human Right. Individuals now have the right to demand and not beg for a healthy environment.

Growing up in a mining community, I witnessed much environmental degradation as a result of mining, especially from illegal mining activities. Illegal mining was mostly done by community members and economic migrants. Most of the water bodies we depended on at some point changed to brownish colour instead of their usual clear nature. On multiple occasions, I, together with other community members, witnessed several instances where we had to wait several hours for the water fetched from the streams to settle so we could sieve it before use. One marveled at the quantity of mud at the bottom of the bucket after the process of sieving. During some of my community engagement duties, other community development officers and I also

witnessed the change in color of several bodies of water on our way to some of the mine catchment communities. There were several complaints from community members (farmers and hunters) during most of our stakeholder engagement meetings with leaders and members of the mine catchment communities regarding uncovered pits that served as traps, especially for children. There have been several reports from community members on the death of several kids as the result of them falling into uncovered pits. On January 23, 2013, as part of our community engagement procedures as community development officers, a meeting was scheduled between Awona and Nyamebekyere communities, who were then part of the mine catchment area. The venue for the meeting was the Awona community, but to our surprise, Nyamebekyere community leaders could not attend the meeting. This was because that morning a child went playing and got drowned in one of the illegal mining uncovered pits that had been filled with water. This avoidable tragic death was terrible news for the community. We drove by after the meeting with Awona community leaders to express our condolences to the bereaved family.

Gyan (2019), conducted research at Prestea, a mining town in the Western Region of Ghana, and reported that his research participants complained about the environmental impacts of small-scale mining in the area. According to them, most of their farmlands have been destroyed, and their water and air are polluted. One of the participants who was a hunter revealed how they could no longer engage in their hunting activities due to the activities of small-scale miners. According to him, all the animals have relocated to other places. Research participants further revealed that they cannot use the river bodies in the communities for domestic and agricultural purposes (irrigation of crops in the dry season). They added that the Environmental Protection Agency (EPA) has advised them to refrain from using these river bodies due to the chemicals released into them due to small-scale mining activities. Some chemicals used in small-

scale mining, like mercury and cyanide arsenic, are very harmful to humans, and most of these chemicals are released into the air and river bodies during the process of mining (Gyan, 2019). According to research participants, they have lost most aquatic species in these rivers. Participants confirmed that the serene environment they used to live in is no longer the same due to small-scale mining activities. Danso, one of the research participants, explained it this way:

> What I even hate about them is that they have destroyed all our water bodies. At first, we used to drink from them but now you can't even use it to wash your feet. The colour of our water bodies looks like tea with milk. We therefore no longer drink, cook or wash from them anymore (Gyan, 2019 p. 48).

A valuation of the environmental and health impact of mining in Ghana, according to Dr. Amoako Atta (head of the renal unit at the Komfo Anokye Teaching Hospital), shows that there is an increase in kidney disease as a result of the use of mercury by illegal miners (Emmanuel et al., 2018).

Donkor E. (2023) in a Joy News documentary sponsored by TRUSTAFRICA on YouTube, "Poisoned for gold: illegal miners using mercury to collect gold, exposing residents to danger" reveals several impacts of illegal mining on the environment and mining communities in Ghana. In the documentary, Donkor E. (2023) likened water to human blood and how important it is to ensure the effective functioning of society. According to him, water, which serves as the lifeblood of our existence, the soil, the trees, our ecosystem, agriculture, fruits, and vegetables, is poisoned in the quest for gold by irresponsible mining. In the documentary, a correlation is made between the concentration of heavy metals in the placenta of some mothers residing in mining communities and deformed fetuses. Prof. Paul Poku Sampene Ossei, a pathologist, scientist and senior lecturer with the Kwame Nkrumah University of Science and Technology (KNUST), in a

research on his first case in Western North–-Bibiani regarding a deformed fetus whose mother died during delivery, discovered a concentration of mercury, lead and arsenic in the placenta of the mother. The baby had deformed lips, deformed eyes, no identifiable sex, and a malformed head. According to Dr. Sampene, four cases were also discovered in Ghana's Ashanti, Western, and Central regions. He then noted that there is the spillage of pollutants into the ecosystem that needs to be addressed. He concluded the presence of heavy metals in the system needs further public health research on a large scale.

In the same documentary, a gold dealer describes the smelting process of retrieving gold from the gold dust he buys from illegal miners (Donkor E., 2023). Fire or gas is used to heat the gold mercury amalgam, which vaporizes the mercury to obtain pure gold. During this heating process, this white foggy vapor produced contaminates the environment. The vapour, according to Joy News, is very toxic to the people living around the area, especially pregnant women. Teschner (2012), in his study, also confirms the burning of mercury-impregnated putty at home on cooking stoves by women in confined areas. According to Teschner, this burning takes place in the presence of neighbours and children. “Women and children are disproportionately exposed to harmful mercury fumes that lead to birth defects and brain damage (Hilson, 2002a; Hentschel et al., 2002 cited in Teschner 2012, p. 309). Kofi Asare, the gold dealer in the Joy News documentary, after engaging in this activity for eight years, now suffers poor health. He is unable to eat and his whole body and hands keep shaking, making it difficult for him to hold any object like a phone or pen. These smelting centres are located in several rural areas in Ghana, indicating the level of danger to which persons living in such mining communities are exposed. Mercury exposure has many deleterious effects, according to Dr. Sampene and Dr. Eugene Ansah (scientist – KNUST). It places one at risk of bone cancer or leukemia and is known to cause fetal

deformities in pregnant women. Uncontrolled mining brings toxic substances to the earth's surface and water bodies.

In the Joy News documentary, Dr. Jackson Adiyah Nyantakyi, the Ahafo Regional Director of EPA, in their research conducted in the year 2022, found alarming levels of mercury in fish in the River Tano. Dr. Yusuf Tijani, a medical doctor at the Samatex Hospital Samereboi, also notes how his years of practice in galamsey areas have exposed him to certain ailments that point to exposure to toxins from irresponsible mining, including kidney and liver diseases.

Donkor E., (2023) in a Part 2 of the documentary on YouTube further confirms a link between metals and food in mining areas. Dr. Albert Kobina Mensah, a research scientist with a PhD in heavy metals, confirms heavy metal contamination in the soil in the Tarkwa and Prestea areas in the Western Region of Ghana. He also confirmed the alarming concentration of heavy metals in soil samples taken from Obuasi and cultivated in a pot in a greenhouse. According to Dr. Mensah, acheampong, which serves as a medicinal plant in most of these communities, absorbs higher concentrations of arsenic, lead, titanium, and copper from the roots to the stems and then to the plant's leaves. The same applies to *agyama*, which is another medicinal plant, and confirms that these polluted plants are being used as medicinal plants in these communities, and these members end up unwittingly contaminating themselves. Higher concentrations of metals have also been found in cocoa beans, cocoa pods, cocoa roots, stems, and leaves in mining areas. Alarming concentrations of these metals have also been found in some root crops like cocoyam and cassava. Community members in Prestea also expressed their displeasure with the level of pollution of their rivers, which serve as their major source of water for their daily activities. In the documentary, it was also revealed that most of these illegal mining-infected grounds are used as playing grounds for children in the community, which poses threats to the health of these

children. Dr. Anthony Enimil, a pediatrician and infectious Disease Specialist at the KATH confirms higher levels of mercury in children from mining-prone areas. According to Dr. Divine Amenake, (Head, Respiratory Directorate, KATH), several persons are visiting their unit with end-stage liver diseases linked to pollutants from mining areas in Ghana per their investigations and the job history of patients.

Several rivers in Ghana have been polluted as a result of small-scale mining activities (Darko et al., 2023). In Part 2 of Donkor's (2023) documentary on Joy News, the turbidity of several rivers in the country is high above the accepted level. According to the Joy News documentary, the accepted Nephelometric Turbidity (NTU) Unit for drinking water is 5 NTU and 80 -150 NTU for other water use. However, the 2023 turbidity values released by the Ghana Water Resources Commission for several rivers in Ghana taken at specific source points are as follows:

Table 5: 2023 Ghana Water Resources Commission turbidity levels for some rivers in Ghana.

River	NTU	Source point
Birim	4,340	Akin Oda
	1,296	Osino
Offin	684	Dunkwa
	1,440	Adiembra
Bia	1,059	Dadieso
Butre	482	Ewusiejo

Tano	519	Elubo
Pra	3,940	Twifo Praso
	3,540	Daboase
Ankobra	8,500	Prestea

SOURCE: Joy News (https://www.youtube.com/watch?v=CXhAIKm7uS0, November 6, 2023),

These values are all above the accepted NTU levels for drinking and other uses of water. The communities in these areas rely on these river bodies for daily activities. The brownish milky colour of these rivers confirms the presence of particles and heavy metals which are detrimental to the health of these communities. Samples of some of these rivers tested by Dr. Ansah at the KNUST chemistry department's Sheathe laboratory for heavy metals also revealed higher levels above the World Health Organization's (WHO) as well as the Ghanaian and American acceptable standards. According to Dr. Ansah in the documentary, the acceptable World Health Organisation standard for arsenic is 0.0050 milligrams per litre (mg/L) whereas the United States (US) and Ghana is 0.010mg/L. Rivers Oda, Birim, Pra, Ankobra, Offin, Ashire, Butre, Subri, and Tano in Ghana, recorded arsenic values between 0.216 and 0.444mg/L which are higher than the acceptable values. Acceptable standards for lead in Ghana and the US are 0.015 and 0.10mg/L, however, the tests conducted in the above rivers revealed levels of lead between 0.057 and 0.208 mg/L. River Subri registered 0.13mg/L of Cadmium which is 0.008 higher than acceptable levels and 1.607mg/L of chromium, which is also 1.557 mg/L higher than the acceptable value of 0.50 mg/L according to the WHO, Ghana, and the US. Dr. Eugene Ansah informed that all the tested rivers had a PH level of less than 7 which makes them acidic and can cause irritations in the throat. The Ghana Water Company Limited when interviewed by Joy News in this documentary,

expressed their displeasure with the turbidity and presence of heavy metals in the rivers they treat to the community causing them to spend a lot. According to Fred George Yeboah Afari, station Manager at Daboase Headwork of the Ghana Water Company Limited, most of their pumps are damaged because the pumps are treating silt instead of water. He however informed of a possible shutdown due to insufficient funding and projected Ghana will at a point have to import water into the country if irresponsible mining is not checked.

Several of these River bodies (River Pra, Offin, Jimi and so on) I have known since childhood because they served as great sources of water and food for the nearby communities have been greatly impacted negatively as a result of small-scale mining activities. There have been several instances of flooding, which has destroyed homes and properties of people living around River Pra in Ghana due to the activities of galamsey in the river which has distorted the natural flow of the river. Several community members are using these Rivers as their major sources of water for domestic activities and thinking through these chemicals in these water bodies poses danger to the lives of these people living around these mining areas.

4.2.1 Loss of lives/ Dangers involved in illegal mining process

The Stockholm Declaration on Human Rights stems from the understanding that humans cannot thrive in an unsafe environment. Gold mining practices during the former Gold Coast served as an addition to subsistence farming and craftwork; were generally small in scale and used basic techniques that needed little capital and no specialized skills (Ofosu-Mensah, 2011b as cited in Yankson & Gough, 2019). According to Yankson & Gough (2019), large-scale and small-scale mining had co-existed for several decades when large-scale mining occurred

underground, whereas small-scale mining occurred on the surface. The government established a more attractive investment climate for foreign mining companies since the implementation of the International Monetary Fund, the World Bank's Economic Recovery Programme (ERP), and the successive Structural Adjustment Programmes (SAPs) in Ghana in the 1980s (Yankson and Gough, 2019). This consequently led to the displacement of several existing local artisanal and small –scale miners (Akabzaa and Darimani, 2001; Hilson, 2001, 2004 as cited in Yankson and Gough, 2019)), igniting conflict over access to land between these large scale mines and small-scale miners (Hilson and Potter, 2005 as cited in Yankson and Gough, 2019). Additionally, technological advancement led to the displacement of several workers in the large-scale mines who eventually resorted to illegal mining. Recent galamsey mining practices in Ghana are unsafe and therefore denies the existence of a safe working environment. "In particular, the involvement of Chinese actors in ASM over the last decade or so has transformed the small-scale mining sector through the introduction of new technology, such as the widespread use of excavators, wash plants (trommel), crushing machines (Changfa), water platforms and suction equipment for dredging rivers" (Crawford et al., 2016 as quoted in Yankson & Gough, 2019, p. 8). They also avoid paying taxes and statutory fees, operate in sensitive or restricted areas and show little or no regard to human rights (Owusu-Nimo et al., as cited in Yankson & Gough, 2019). Several individuals and groups lose their lives in the process (Yankson & Gough, 2019).

Recently, aside from illegal miners who mine along river bodies, other groups encroach into the concessions of large-scale mining companies' underground facilities (most of these persons are ex-workers of these companies). This causes lots of friction between large-scale companies and small-scale mining companies, specifically illegal miners. Working as a community development officer, I experienced several of these frictions between illegal miners

in Obuasi and the AngloGold Ashanti Obuasi Mine Company. There were several instances where we were locked up in our offices by illegal miners' threats and confusion and fights in the community. Apart from children falling into the uncovered pits of illegal miners and losing their lives, illegal miners encroach into concessions of large-scale mining companies, risking their lives through unapproved dangerous tunnels in the quest for gold-bearing materials underground. “Many small-scale miners believe that elected officials like Blay are so supportive of their activity that they have taken to bold disruptions of large-scale companies, especially around election time when politicians’ pro small-scale mining rhetoric adds a sense of increased legitimacy to their cause” (Ghanaweb.com, 2010a; Joy FM, 2008, 2011; Hilson and Yakovleta, 2007 quoted in Teschner, 2012 p. 312). Some of these attacks led to the closure of several mining companies including the Obuasi mine for some time which resulted in the laying off of some workers.

On May 29 and 30, 2023, a group of illegal miners encroached on the mine's underground facility. They dug holes that they used to enter the mine's underground facility to mine. As a witness to some of these holes, it is indeed a deadly and unpleasant experience to pass through such a hole. These illegal miners put their lives at stake to pass through such holes to engage in mining activities underground. Some lose their lives in the process, especially when the walls collapse on them. There were several instances where bodies of illegal miners were retrieved as a result of collapsed caves. Some galamsey miners also pass through water pipes to link to the underground mine. There was one instance where illegal miners secretly entered a hot water pipe. The next morning, the pipe operator, without knowing they were there, turned on the tap and these illegal miners lost their lives. Pictures of their retrieved bodies were so

disheartening. I kept asking myself over and over again as to why these vibrant young men would put their lives at risk in such a manner.

On May 29, 2023, I received a call from my relatives and friends informing me about the gunshots and troop of soldiers that had invaded the Obuasi Township. This was a battle between the soldiers and the youth of Obuasi. They informed me they were all scared to step out that whole day due to gunfire because some illegal miners had encroached on the mine's underground facility and had been trapped together. Upon my search on the internet, I found a report on the issue on YouTube, "Obuase: soldiers clash with the youth as over 200 illegal miners trapped underground" (One Ghana TV, 2023). According to the report, Cote Dor, which I am familiar with since I have worked with the company, is one of AngloGold Ashanti's inactive mining areas. However, during the mine's footprint project all these areas were fenced to prevent encroachment because, though the mine is no longer operational in that area, they still need to prevent trespassers from accessing the site since it has a link to the mine's underground facility. Anwiam community is very close to Cote Dor and some of these illegal miners created holes through to Cote Dor from Anwiam to access the mine's underground facility. According to the report, about 300 illegal miners used that route, and created several holes to link to the mine's underground facility. Here, there is the Adansi shaft that serves as a great pillar that prevents the mine from collapsing. This pillar has gold and that is a target for the illegal miners regardless of the consequences. According to the reporter for One Ghana TV (2023), AngloGold Ashanti has informed that there is a need to protect the Adansi pillar to sustain the mine. Some community members in an interview with the reporter confirmed that some of these illegal miners are ex-workers of the AngloGold Ashanti mine who lost their jobs due to the redundancy exercise, and

that is why they can link such holes into the mine's underground facility since they are familiar with the place.

AngloGold Ashanti upon noticing this encroachment covered all the holes and routes these illegal miners used into their underground facility except one so that these miners would have no choice but to come out from only that hole with surrounding soldiers. One Ghana TV station upon interviewing community members on how they became aware of the incident and gathered at the scene, reported that the miners who were stuck underground called some of their relatives on the phone, who in turn notified some of the community members of their ordeal and how they have been trapped underground. These illegal miners move in gangs and so one gang comprising about 10 members came out first and was arrested and sent to the Obuasi Central Police station. The remaining miners on noticing the arrest decided to stay in the hole rather than come out and be arrested. A fight began between the youth and the soldiers, which resulted in gunshots and injuries. The community was of the view that the gold these illegal miners came out with was seized by the soldiers so they should have allowed these miners to go unpunished rather than arresting them after seizing the gold.

Women were crying and lamenting for the safety of their husbands, sons, grandsons, and friends in the YouTube video report by One Ghana TV (2023). One woman confirmed the involvement of her 16-year-old nephew. Some young men in the video noted how their school certificates were kept in their wardrobes because there were no jobs and that galamsey was their only source of income. One illegal miner was interviewed, and he reported that he had gone underground but came out the previous day before this incident. He further added that the illegal miners who are stuck underground currently had been there for at least two or three days. He narrated how deadly their journey through the holes to the underground facilities of the mine is,

together with how the ventilation underground is too cold for a human to stay for such long hours. He elaborated how they crawl through the holes and swim through a pool of water with the luggage (ore) on their head to come out from underground to the surface. When arrested by the soldiers, they are given a fine of GH₵6,000 before being given bail. This was also part of the reason why they never wanted to come out of the hole but rather stay there regardless of the consequences because they had no money to pay such a fine. This rivalry amongst the large-scale companies and small-scale miners has existed in Obuasi for so long causing serious effects on community members, large-scale mines, and the individuals who practice illegal mining activities themselves. They were of the view that their activities do not destroy any body of water or land so they should be allowed to work. But, for the mine, galamsay activities cause harm to their operations and therefore should be stopped. Community members and leaders, therefore, called on the government to intervene in the situation.

In conclusion, some criminogenic conditions in Ghana's regulatory and market structure influence the practice of illegal mining. The criminogenic regulatory structure regarding compensation packages paid to farmers who lose their lands to mining activities, the cumbersome registration process, and the costs involved, influence the practice of illegal mining. The payment of compensations is based on legal foundations; however, there are no clearly stated payments, creating lots of variabilities and confusion as to a fair and suitable payment to be made to affected farmers. Eventually, farmers who rely on these farms to provide for their families are pushed into illegal mining as an alternative source of livelihood. A criminogenic market structure also exists in Ghana which encourages the practice of galamsey mining. Several middlemen and gold dealers exist aside from the government-owned Diamond Marketing Corporation (DMC), known as the Precious Mineral Marketing Corporation company, mandated

to sell and buy gold from miners in Ghana. The existence of these market avenues makes the sale of gold easier for these miners. The lax regulations and weak enforcement of illegal mining policies in Ghana especially corruption on the part of law enforcement bodies and political parties also influences and encourages the practice of galamsey in Ghana. The issue of poverty and inadequate employment opportunities in the country also encourages several Ghanaians to resort to substituted institutionalized means, which eventually pushes them to illegal mining.

The failure to regulate illegal mining activities in Ghana culminates in several environmental degradations and diseases, negatively affecting most Ghanaians. Several heavy metals that are harmful to humans are disposed into the environment and bodies of water. Heavy metals have been found in the placenta of pregnant women, especially those who live around mining areas, causing several fetal deformities. A link has also been made between heavy metals in foods and medicinal plants. Illegal miners lose their lives as a result of the unsafe working conditions and environment they operate. Small-scale mining affects the fundamental human rights of individuals and, therefore, is of great concern. Illegal mining was an issue mentioned and discussed during the United Nations Congress on Crime Prevention and Criminal Justice (2015), demonstrating its significance as a global issue and focus of criminologists. Small-scale mining in Ghana, especially illegal mining, is causing severe damage to the environment and the health and life of people living around the mines. There is a need for a wake-up call from the government and Ghanaians to curb this menace to save lives and that of the environment.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

Small-scale mining has been practiced for years in Ghana, so one will ask why it has recently become a concern and problem. Why is it now a serious concern worldwide, especially in African countries? This work has critically examined some of the impacts of recent small-scale mining activities on the health and environment of communities where they are being practiced and some of the criminogenic factors that influence the practice of illegal mining in Ghana.

It has been established that some of the factors that push Ghanaians to mine illegally in the country are a result of the criminogenic regulatory structure concerning the payment of compensation to affected farmers who lose their lands as well as the cumbersome and costly registration process one has to go through to register to mine legally in the country. Additional criminogenic factors include the market structure available for the sale of gold in the country, lax regulations, and weak enforcement of illegal mining regulations in the country, inadequate employment opportunities and education (poor educational background of most Ghanaians) as well as poverty. The strain involved as the result of the above-mentioned factors pushes Ghanaians to mine illegally in the country regardless of the consequences.

Galamsey mining during the colonial era, where gold was gathered and sold, differs from the current Galamsey practice in African countries specifically Ghana. Currently, several chemicals, including mercury, are being used in the mining process, destroying water bodies and the environment, which harms the health of those living in mining areas in Ghana. Children in the community are losing their lives as a result of uncovered illegal mining pits. Farms and several river bodies are being destroyed in Ghana. Rivers Birim, Offin, Bia, Butre, Tano, Pra,

and Ankobra have been tested with turbidity levels above the World Health Organisation, Ghana, and the United States (US) acceptable limits. Several river bodies, including Oda, Birim, Pra, Ankobra, Offin, Ashire, Butre, and Tano, also have arsenic, lead, cadmium, and chromium levels above the World Health Organization, Ghana, and US acceptable values for drinking and other uses of water.

The concentration of these metals in the environment and river bodies have been linked to birth defects in pregnant women. Several strange diseases, including leukemia, kidney and liver diseases, have been linked to the concentration of toxic substances in the environment and water bodies as a result of small-scale mining (illegal mining). A link has been created between heavy metal and food in mining areas. Several chemicals, including arsenic, lead, titanium and copper, have been found in root crops and soil in mining areas, including Tarkwa, Prestea and Obuasi. Some medicinal plants like *acheampong* and *agyama* have all been contaminated, especially in mining areas. Several contaminated water bodies still serve as primary sources of drinking water for several communities in these mining areas. Illegal miners who encroach on concessions of large-scale mining companies put their lives at risk regarding the dangerous caves and tunnels they pass through. Some of these caves collapse on them, resulting in unfortunate fatalities. The friction between these galamsey miners and large-scale mining companies also threatens the peace and security of mining communities as a result of large-scale companies protecting their concessions.

As identified by green criminology, humans and diverse living things are suffering from the damage caused to the ecosystem as a result of illegal mining activities. Healthy food, clean water, and clean air needed by humans to survive have all been compromised as the result of the practice of illegal mining activities. The right to freedom, equality, and adequate conditions of

life in an environment of a quality that permits a life of dignity and well-being, and the responsibility for humans to protect and improve the environment for present and future generations according to the 1972 Stockholm Declaration, have been compromised. The damage done to the environment as the result of the practice of small-scale mining in Ghana is affecting the right to life of all living creatures living around mining areas and beyond.

Presently, small-scale mining is seen worldwide as a cause of resource depletion and environmental degradation in regions where such valuable minerals are extracted (Hentschel et al, 2002). The circumstance is more disturbing when the camera is switched to galamsey mining in Ghana. The method of mining used by these illegal miners is not regulated by the Environmental Protection Agencies (EPA) as is done for large-scale mining companies (Yankson & Gough, 2019). Therefore, land degradation and harm to the environment are inevitable, which in effect has an adverse influence on the lives of the people in the area. Environmental degradation has negative effects on the health of the people, including whether they will live or how long they will live, and their development. There is therefore the need for measures to be put in place to ensure the rights of these communities and people in small-scale mining area are restored. The right to a healthy environment has now gained international recognition and therefore people now have the right to demand and not just beg for a healthy environment.

As Dr. Elizabeth Alluah Vaah, the Executive Director for Ghana Environmental Advocacy Group, has argued, galamsey is a public health emergency (Joy News, 2023), emphasizing the need for urgent measures to be put in place to address the situation. In this light, the recent license given by the Mineral Commission for small-scale mining at the Nzema Amanzule conservation area (Joy News, 2023) must not be encouraged. In Ghana's quest for

economic development, public health and the people's human rights and development should be prioritized, but whether that will happen depends on the commitment of every Ghanaian.

5.1 Recommendations

The intersection between ecological destruction and human rights is a crucial and intricate issue, especially obvious from the perspective of galamsey mining in Ghana. This study has explored some criminogenic conditions that influence the practice of illegal mining in Ghana, the various impacts of illegal mining revealing significant environmental degradation alongside human rights violations faced by those living around mining areas. The insights gained emphasize the need for targeted interventions to reduce the adverse effects of galamsey mining and ensure sustainable development in the country. The recommendations below are informed by the research findings and aim to address the criminogenic conditions (crime producing factors) that influence the practice of illegal mining as well as its ecological and human rights challenges.

- Providing adequate employment opportunities and skills training programs to reduce the country's unemployment and poverty rates. . This can be achieved through the provision of financial assistance in the form of low-interests loans to entrepreneurs as well as the creation of a conducive environment for emerging companies or entrepreneurial ventures by reducing lengthy and complicated procedures for obtaining licenses and registering a business. Additionally, anti-corruption efforts can be intensified to ensure funds allocated for job creation and skills development are effectively used. To encourage job creation, labour laws can be reviewed to ensure they are conducive for both employers and employees

- Extensive (national, regional, and district levels) community engagement (especially mining communities) on the effects of illegal mining on their health and the environment. This will help spark community interest in the need to fight against illegal mining to protect their health and the environment. Most people living in rural areas are unaware of most of the consequences of their actions. Large-scale mines can also partner in this initiative to educate local communities during stakeholder engagement meetings.

- Large-scale mining companies should provide priority employment and skills development programs to qualified members in their catchment communities. This will also help community members in mining areas acquire the needed skills to meet the employment requirements in such companies.

- Large-scale mining companies should implement comprehensive financial literacy programmes and diverse alternative livelihood projects to empower affected farmers who lose their lands to mining activities. This helps to mitigate the social and economic impacts of land loss and as well contribute to community development and resilience.

- A reform of the 1989 small-scale mining laws to reflect the current practice of small-scale mining in Ghana. As the name depicts "gather and sell" at the time, it reflected an artisan form of mining with simple tools. However, the practice of galamsey has changed with the use of pieces of machinery and chemicals that are harmful to the environment. A reform of the law to incorporate these technological advancements together with properly laid down environmentally friendly procedures will help as this sector has been proven to have great potential for rural poverty reduction.

- Large-scale mining companies can invest in research and innovation as part of their sustainability initiatives to develop sustainable mining technologies and practices (in the artisanal small-scale mining sector) that can help advance environmental protection, resource efficiency, and community development.

- An update of the Ghanaian constitution to include properly laid down compensation packages (for both lands and crops on lands) for farmers who lose their lands to mining activities. Properly laid down packages will ensure that everyone is treated equally and fairly. These packages will help them explore other ventures to cater for themselves and their families and reduce their dependence on illegal mining as the only option. Financial literacy programs can also be offered to help farmers utilize their compensations effectively.

- The need for an amendment in the small-scale mining registration process and financing opportunities (for example banks in Ghana can offer such options) for small-scale miners to prevent illicit sources of funding that encourage illegal mining.

- A single state-owned marketing company responsible for selling gold with branches in every region of the country. Having a single source for marketing gold with tight security will help discourage illegal mining since they cannot market the gold being mined. Having tight security will also help prevent the smuggling and illegal sale of gold out of the country.

- Law enforcement, right leadership, and political will: Several scholars who have studied the issue of illegal mining in African countries, especially Ghana, blame it on the lack of enforcement of laws on the part of leaders. Law enforcement and strategic decisions and a clampdown on corruption on the part of leaders, especially politicians and law enforcement

agencies, regarding illegal mining activities in the country will go a long way to help curb the practice of illegal mining in Ghana (see also Teschner 2012 p. 312).

- A repeal of the 1989 mercury law (PNDCL 217): Considering the level of environmental degradation and health risks posed by these heavy metals, especially mercury, to mining communities (especially small-scale mining communities), a ban on mercury use will be ideal for the time being. Banning mercury use in the country with strict security and monitoring to ensure the ban's effectiveness will help look for natural ways to effectively restore the polluted water bodies and environment. Restoring the environment will ensure a safe place for all living creatures while seeking environmentally friendly ways to extract these minerals. The unregistered galamseyers also easily take advantage of the availability of mining inputs such as mercury and machinery made available by the laws to support the registered few. In an interview with Joy News on YouTube, Dr. Abdul-Wadood Moomen, a senior lecturer at the School of Mines- University of Energy and Natural Resources (UENR) mentioned the availability of other metals for mining that are somewhat environmentally friendly compared to mercury. Such ventures can be explored to mine effectively and efficiently without compromising the health of humans and the environment (see also Joy News on YouTube "Poisoned for gold: scientists warn of possible toxic metals in crops and fish from mining areas" (Joy News, 2023). By implementing these strategies, stakeholders can work together for a more equitable and environmentally sustainable future for affected regions in Ghana.

5.2 Suggestions for Future Research

Issues about mining especially small-scale mining is very important considering the fact that this sector has been proven to reduce the rate of poverty as well as serve as an alternative source of livelihood for several Ghanaians. Future research can explore several avenues for deeper solutions to this situation while ensuring the sustainability of the environment for future generations. From an economic and social dimension, alternative livelihood strategies for communities affected by mining can be explored. Some of these livelihood projects exist, but most do not fit the community's needs and interests. Most of these projects are crafted and imposed on most of these communities. I have witnessed several alternative livelihood projects in some communities in Obuasi that did not serve the intended purpose, such as a mushroom project established for the Apitikooko community in Obuasi. This will be a great future research avenue to help ensure mining communities' sustainability and development. If these communities have something they are doing to provide for their families, the tendency to engage in illegal mining activities will be reduced.

Another future adventure is to conduct international comparative studies to compare the situation in Ghana with other countries. Ghana is a developing country and can be compared to a developed country like Canada. There are mining companies in Canada, so such avenues can be explored to discover why illegal mining is not being faced in such a country. This knowledge can inform best practices and policies that can be transferred to help solve the illegal mining menace in the country.

5.3 Study Limitations

Autoethnographic research helps to provide an in-depth understanding of personal and cultural phenomena that other methodologies may not capture. Employing techniques like rigour, reflexivity, and secondary sources of data also helps to enrich and increase the authenticity of the research findings. However, this research is based on the researcher's experience, perspectives, background, and beliefs and may not encompass the full scope of the ecological and human rights issues involved in the practice of illegal mining. Some important aspects of this topic may be overlooked.

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