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SECURITY IMPLICATIONS OF IMMIGRANTS' PARTICIPATION IN THE MINING SECTOR OF GHANA

BY

PAUL AYIAH HAMMOND

(10303292)

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DECLARATION

I, Paul Ayiah Hammond, hereby declare that, except for references to other people 's work, which have been duly acknowledged, this dissertation is the outcome of my independent research conducted at the Centre for Migration Studies, University of Ghana Legon, under the supervision of Dr Ken Ahorsu. I, therefore, declare that this dissertation has neither in part nor in whole been presented to any other institution for an academic award.

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PAUL AYIAH HAMMOND **DATE**

(STUDENT)

……. **…….…….**

DR. KEN AHORSU **DATE**

(SUPERVISOR)

DEDICATION

I dedicate this dissertation to God Almighty, my parents Mr Emmanuel Ato Kwamena Hammond, Madam Grace Arthur for their support in every step of my education. To my lovely wife Louisa Opomea Asante and my son Jed- Bryan Kwabena Hammond I say thank you and God bless you.

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LIST OF ABBREVIATIONS

ECOWAS	Economic Community for West African States
EU	European Union
GUTA	Ghana Union of Traders Association
IOM	International Organization for Migration
OECD	Organization for Economic Cooperation for Development
SPSS	Statistical Package for Social Sciences
SSM	Small Scale Mining
UN	United Nations
UNDESA	United Nation Department of Economic and Social Affairs
UNDP	United Nations Development Programme

ABSTRACT

Globally, mining activities are mostly deemed to affect the environment negatively especially in developing countries. In view of this, it is important to examine the security implication of immigrant's participation in the mining sector in Ghana with emphasis on Adaase mining community. The research design adopted for the study was a mixed method. The sample size was made up of 105 respondents selected through simple random sampling technique. Instruments used for the study were structured questionnaire and in-depth interview guide. The quantitative data was analysed using SPSS and the qualitative through the use of thematic analysis. The result shows that general knowledge of illegal small-scale mining was evident in the study area (86.7%) with foreigners in such mining activities constituting more than a quarter. Again, the most immediate effect from illegal mining activities on the environment was the reduction in forest cover and pollution of water bodies. Furthermore, dust pollution experienced from surface mining was dust particles in the air that affected people of the community. The finding revealed that negative impact of mining on farming activities was the absence of water for crops and lack of cultivated lands. With respect to the migrant level of involvement in mining activities, the outcome shows that migrants were backed by some influential people in the community as a result of their financial resources. It is concluded that perception about immigrant's mining activities affected the community negatively since key resources such as land, water bodies and forest covers suffered the most. It is recommended that the government of Ghana through its agencies responsible for mining and its related activities should ensure strict compliance of mining regulations to curtail the illegal mining activities and reduce its effects on such communities.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Migration is a phenomenon that involves varieties of movement, processes and situations of people from divergent backgrounds. It is one of the complex phenomena that impacts and affects human societies and communities at the economic, social, and political and security levels. People migrate for a variety reasons. The reason for migration may be an adventure, tourism, education, economic, professional, economic, the search for greener pastures, health, family, or security. Although we live in communities, societies, and a globalised world; these habitats are not evenly developed, congenial or safe. In equalities in terms of development, congeniality and security; in turn, served as 'push and pull factors' in driving migration. This has created disparity or inequality among nations regarding their socio-economic status leading people to aspire to move to high-income nations who have better opportunity to make it in life (Imerion, 2017; Modarres, 2010). Thus, often, the proclivity for migrants is to be attracted to more developed and stable communities and societies of the world. Migration is seen as one of the major and important options for improving livelihoods. Employment opportunities with improved remunerations is an example of a driving factor of migration (Assefa Admassie, Nuru, & Ferede, 2017).

Current global estimates indicate that there continues to be an increase of international migrants; from 222 million in 2010 to around 244 million in 2015 which represents just a third of the world (UN DESA, 2017). This increase in international migration is more evident when current figures are compared to past international migration numbers. The International Organization for Migration 2003 World Migration Report projected that by 2050 international migrants would account for 2.6 per cent of the global population or 230 million (UN DESA, 2002), however, in 2010 that projection was revised and increased to 405 million by 2050 (IOM, 2010). Even though the figures are significant, it still represents a small number of the global population with most of the migration happening within

countries; in 2009 it was estimated that about 740 million people were internal migrants (IOM, 2010).

Previously, whiles migration was considered as only a social and economic phenomenon, it has now become one of the most talked-about in global politics (Huysmans, Jef and Squire, 2009). Migration has emerged as a security issue since the end of the Cold War and the social and political change associated with the emergence of globalisation. In the wake of the 9/11 terrorist attack in 2001, migration has increasingly been conceptualised as a transnational security threat. (Stivachtis, 2008; Tirman, 2004). The changing nature of migration with different categories such as refugees, asylum seekers, diasporas, religious militancy, and academic and economic migrants have all influenced the current debate on migration and security and how we think of migration in general (Castles and Davidson 2000). Equally, there has been concern about the growing number of refugees and internally displaced persons (IDPs) in the world and how these trends pose threats to migrants and nations. They are viewed as putting pressure on the scarce resources available in their destination countries. In the migration-security nexus, economic migrants are also perceived as threats and created fears in host countries about a surge in unemployment among citizens as well as a rise in criminal activities (Parliament Briefing, 2015; Rudolph, 2006). Despite refugees and economic migrants being two distinct categories; it has been argued that irrespective of their distinctiveness, they will still consume economic resources in the host countries. Security-wise, migrants are often seen as posing cultural, religious, xenophobic, and militant threats to the destination countries. concerns impact on countries.

In Africa, intra- and inter-country movements of people continue to be the dominant feature of migration and people's survival strategies. West Africans are found all around the world. However, most of the sub-regions migrants are found in other West African countries. The figures indicate that more than half of the migration occurs within neighbouring countries in Africa (Awumbila, 2018). The bulk of migrants such as temporary cross-border workers, especially female traders, clandestine workers, seasonal migrants, professionals, refugees, farm labourers, unskilled workers, and nomads, etc. are labour migrants who move to other parts of Africa to improve their livelihoods. This is evident in the 2017 World Migration Report. In 2015, over 16 million Africans were living in another African country and this

population of migrants has been growing for the last five-year period (UNDP, 2009). The large movement of unregulated migrants, people of a different race and different nationality within Africa can have a significant effect on the stability and security of the host country. Short term migrants are often seen to be engaged in terrorism, drug trafficking, human trafficking, money laundry, organise crime and cybercrime. The fight against the illicit movement of small arms and weapons across the African region have, likewise, turned attention on migrants who have the potential to destabilize the security of a country (Africana, 2006).

From the pre-colonial era up to 1960s, Ghana's relative economic stability, prosperity, and hospitality made Ghana a major destination place for migrants from the West Africa sub-region (Anarfi, 1982). The opening up of cocoa and oil palm, minerals such as gold, diamond, bauxite, manganese, and timber industries and massive infrastructural development projects all served as pull factors that attracted large numbers of immigrants from other African countries into Ghana (Anarfi & Kwankye, 2003; Awumbilla, Benneh, Teye, & Atiim, 2014). This was in response to the demands for labour due to the discovery of minerals. The recent discovery of oil has also attracted people from West Africa and beyond. The economic performance, the discovery of oil and legal and illegal mining of minerals such as gold have attracted both skilled and unskilled labour to Ghana (Awumbilla, Benneh, Teye, & Atiim, 2014). The implementation of the ECOWAS Protocol on Free Movement of Peoples and Goods and Establishment has also upped cross border movement particularly labour migration within the sub-region (Konsiega, 2005). Ghana being a signatory ECOWAS Protocol on Free Movement of People and Goods and the AU Protocol on Migration have resulted in increased immigration into Ghana. The stock of immigrants from other ECOWAS countries to ghana had arisen to 409,910 making up 1.68 percent of the total population in 2012 (Awumbila, Benneh, Teye, and Atiim, 2014).

As early as the 20th century, there had been a considerable number of labour migrants moving to the mines in Ghana and a number of these were from neighbouring West African countries and beyond (Harvey and Brand, 1974). The GIPC Act (865) which has been in existence since 2013 has helped the Ghana government in promoting and attracting

investments into the country, as they seek to create an enabling environment for investments in Ghana and related matters as well. Friedberg and Hunt (2007), however, identify the contentious nature of immigration especially in the retail and mining sectors of the Ghanaian economy. Interestingly, many of the main issues in the debate on immigration policy are identified to be economic, where attention is paid to the potential adverse effect on the labour market outcomes of native-born workers. With this, persons who take a dim view of immigration believe that immigrants may compete with (indigenous)native-born workers in the labour market, displacing them in employment or reducing wages (Friedberg and Hunt 2007).

Mining has and continues to play a vital role in human society. Many African countries are endowed with mineral resources, therefore, making mining a major economic activity in those countries. In West Africa, mining can be traced back to centuries ago before the exploration of the continent by Europeans in the fifteenth century (Adjei, Oladejo, & Adetunde, 2012). The abundance of mineral resources in some parts of Africa earned them names such Gold Coast (Ghana) and La Cote d'Ivoire (Ivory Coast) with Ghana gold deposits being ranked as the ninth in the world and second in Africa behind South Africa (Owusu & Dwomoh, 2012).

Small-scale mining has proven to be very beneficial to developing countries through the provision of employment and revenue. In Ghana, it has been estimated that the small-scale mining sector employs about one million people and provides support to around 4.5 million people (McQuilken & Hilson, 2016). A contrast is made between formally registered small-scale miners and illegal miners known as galamseyors (which is a coined form of the english phrase 'gather and sell') (Yankson & Gough, 2019). These galamseyors mostly operate without the sanctions of regulatory bodies such as the Ghana Minerals Commission, Environmental Protection Agencies among others. Without the regulations of these state institutions, galamseyors have extended their activities to sensitive areas such as water bodies and forest reserves (Owusu-Nimo, Mantey, Nyarko, Appiah-Effah, & Aubynn, 2018). Since independence, foreigners have always been part of the history of mining in Ghana; with evidence showing foreigners from neighbouring West African countries moving to mining communities in Ghana (Nyame, Grant, & Yakovleva, 2009).

In recent times, however, there has been an increase in the pace of movements of migrants into the mining communities to engage in mining even though artisanal or small scale mining in Ghana by law is limited to only Ghanaians.

According to Crawford, Agyeyomah, Botchewey, & Mba, (2016), within the year of 2012 and 2013, a lot of migrants or several migrants such Chinese, Arabs, Indians Malian, Niger, Congolese, Burkinabe, etc. have been engaging in illegal mining in Ghana, about 50,000 Chinese nationals had migrated to Ghana to engage in mining activities which included both the legal and illegal small-scale mining leading to the increase production of gold. Mining is an important economic activity in Ghana which provides employment, fuel the economically significants, and supports livelihoods and contributes to the national economy (Hilson, 2016; Fisher, Mwaipopo, Mutagwaba, Nyange, & Yaron, 2009). Despite these contributions, migrants activities in the mining sector endanger the environment especially through the use of adverse and other mining methods which are not the best or compatible with sustainable mining. These lead to the degradation of environments, pollution of water bodies, the poison of water bodies, natural resources being destroyed. Besides, illegal mining introduces diseases such as water-borne diseases and the proliferation of small arms.

Destructions caused by illegal mining activities include the destruction of cocoa farms, deforestation and land degradation, and security threats to the people of Ghana (Al-Hassan & Amoako, 2014). This led to the establishment of the inter-ministerial taskforce by the Government in 2013 to stop these illegal miners. Although there has been a reduction of illegal mining, there are still some foreign miners that are still working in remote areas. This study seeks to understand the various roles played by migrant miners in the illegal mining sector and how it impacts the environment as well as security.

1.2 Problem Statement

Ghana has undergone significant growth since the turn of the century with the mining industry being one of the main contributing factors. For instance, in 2017, the mining subsector contributed a total of GH¢17.1 billion to the country's GDP (peacefmonline, 2018). Labour migration from within the West African Sub-region, as well as other parts

of the world, plays a major role in Ghana's mining industry. Mining especially Artisanal small-scale mining is more condensed in the towns and forest areas of Brong-Ahafo, Ashanti, Eastern and Western regions. It has attracted and continues to attract, not only Ghanaians but also immigrants to mining communities who come even beyond the continent of African (Alhassan, 2014).

In recent times, Chinese migrants have played an active role in the mining industry with the number rising sharply. Since 2005, there have been reports of as many as 50,000 Chinese moving from China to Ghana's mining sector (Kane, 2013). There have been concerns that illegal mining is degrading the environment and complicating the adverse effects of climate change. It has been well documented how illegal-Chinese run operations have had a significant impact on the environment including water bodies in Ghana. For instance, they have been accused of destroying tracks of lands in various townships and dredging water bodies which end up destroying these water bodies (www.spectatorgh.com). It was well elaborated how illegal Chinese mining population flooded roads used by villagers to access markets as well as seized farmlands unscrupulously. Reports have indicated that weapons are believed to have been left behind by migrants engaged in illegal mining which have ended up in the hands of the locals in the community who are now using it against security officers (Myjoyonline.com, 2013). For these reasons, I want to find out how rampant is the foreigners involved in illegal mining in Ghana and also enquire about out how these foreigners can access these mining concessions as well as the role they have played environmental degradation, food insecurity, water pollution and other forms of crimes in the communities where they are found.

1.3 Objectives of the study

The main objective of the study is to explore the security and environmental implications of immigrants' activities in the mining sector of Ghana from the perspectives of affected communities as well as migrants. The specific objectives are, to:

- Examine the level of migrants' involvement in illegal mining;
- Examine how migrants access mining concessions and their activities;

- Explore the impact migrants mining activities, have on communities; and,
- Make recommendations

1.4 Significance of the Study

Mining is an important sector in Ghana, serving as one of the main sources of economic development and contributes to foreign exchange for the country. Ghana's endowment of minerals has attracted many migrants into the mining sector which has sometimes had negative impacts including environmental and security effects on the mining communities. Despite the numerous scholarly and policy studies undertaken over the years on the mining sector in the sub-region in general and Ghana in particular (e.g., Akabzaa, 2000; Aryee, 2001; Aubynn, 2006; Gibb, 2006; Aryee et al., 2003; MacDonald, 2006; Yelpaala and Ali, 2005; Tschakert and Singha, 2007), certain aspects such as security implication of the economic activities of immigrants in the mining sector have not received much attention. The study will provide empirical evidence on the security implication of mining activities in Ghana; specifically, in the area of Adaase in the Amenfi West District. These findings will be relevant to policymakers in an attempt to find a permanent solution to the issue of mining activities in Ghana. The study provides information on the socio-demographic backgrounds, the impact of mining activities by immigrants and security implications of these activities to Ghana which will contribute to the scanty literature on migration and security in Ghana.

1.5 Organization of the study

The study is structured into five chapters. Chapter one composed of the background where the literature of the study and topic areas is introduced. Also included are problem statement, objectives of the study, rationale for the study and how the study has been organised.

Chapter two has an in-depth literature review of both the study and topic areas. Chapter three contains the study area, research design, target population and sampling technique, sources of data, data analysis, ethical considerations and limitations. Chapter four contains the analysis and presentation of the data collected from the field and interpretation of the study. It specifically looks at the socio-demographic characteristics of migrants and

residents making the sample. Chapter Five: Summary of Finding, Conclusions, and Recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews the extant literature on migration and security, migration and mining (particularly small-scale mining), migration and ecological conflicts, and migration and its security implications. Empirical studies globally, regionally, and nationally (Ghana) are reviewed to demonstrate the various dynamics of migration that has implications for international and national security.

2.1 Migration and security

Before and during the Cold War, more emphasis on security was placed on inter-state wars, as threats to states and the international system was conceptualised from the perspective of international anarchy and rivalry among states issuing from the parochial pursuit of national interests (Wolfers, 1962). The states' main concern was to promote and protect their national interest and mitigate threats from other states. As Poku *et al* (2000) point out, issues of whether migration as a phenomenon poses a threat to the state, government or citizens were not given much attention. Migration was looked out largely from a classical economic theory perspective; that is, complementing the human resource weaknesses of the destination country and the benefits, therein, accruing to the migrants and the countries of origin. The end of the Cold War and intensification of globalization have influenced the international system in shifting their focus from state-centric security calculus to the individual in terms of security. Thus, security has largely be defined in terms of human security. This new focus has led to the broadening of security issues. Migration has since

been incorporated into the new security discourse (Ibrahim, 2005; Krause & Williams, 1997). The emergence of migration as a security issue became more profound as a consequence of post-Cold War intra-state conflicts that have been occasioned by forced migration. Since the 9/11 Terrorist Attacks on the World Trade Centre and the Pentagon in the United States of America, migration has increasingly been conceptualised as a transnational security threat.

The discourse on the link between migration and security, and the paradigm shift towards human security, which places a focus on the individual, has its watershed in the 1994 United Nations Development Report that stressed the importance of having a measuring tool for human security. The Report states that "For most people, a feeling of insecurity arises more from worries about daily life than from the dread of a cataclysmic world event. Will they and their families have enough to eat? Will they lose their jobs? Will their streets and neighbourhoods be safe from crime? Will they be tortured by a repressive state? Will they become a victim of violence because of their gender? Will their religion or ethnic origin target them for persecution?" (UNDP, 1994: 4, 22). This signified a significant shift from the view of security in relation to states and military prowess to mundane risks that pose threats to populations (Ibrahim, 2005). These threats or risks included challenges excessive international migration, environmental degradation, unchecked population growth among others (UNDP, 2002). However, the paradox of this new paradigm approach is that migrants are seen as threats to receiving countries' population, thus increasing their vulnerabilities (Ibrahim, 2005).

Many factors are influencing the migration-conflict nexus and these factors could be social, economical, environmental and political factors (Kumssa, Williams, Jones, & Des Marais,

2014). Migration and security have taken a centre stage of politics with the current president being elected based on that rhetoric. For instance, in Italy and Great Britain immigration has been a dominant topic during elections. This has influenced the public perception of immigrants in Italy with the majority of Italians perceiving immigrants as threats to their safety (Di Carlo, Cloos & Saudelli, 2018). It has also given rise to ultra-nationalist parties and white supremacists vigilanteism.

Xenophobia is one result of perceiving migrants as a threat to the local population; that is the perceived threats migrants pose to the economic, political or social well-being of indigenes of the local population (Kaya, 2007). The threats of Chinese presence in the retail trading sector in Ghana is one example. The ability of Chinese manufacturers to produce goods for low-income consumers and adapt their technology to produce African design patterns present poor Ghanaian consumers with more options, in terms, of their relatively weak purchasing power. Consumers who cannot afford to buy goods from these high-end stores benefit from the Chinese products being sold on the market. These markets are cheaper than most goods on the market. However, this exposes vulnerable local consumers and markets to the influx of cheap products. The influx of Chinese and their businesses in Ghana has led to agitations among the populace especially those directly affected by their activities. This perceived threat posed by the Chinese importers has resulted in public protest. The Ghana Union of Traders Association (GUTA) has protested mostly in the Accra Business District, Kumasi Suame Magazine, and Kumasi Central market areas against the Chinese and Nigerians in retail businesses. The protest and agitations against Chinese traders in Ghana began in late 2005, according to Takyi- Boadu (2005). Recent

agitations between Ghanaians and Nigerians traders in Ghana revolve around the high rate at which they say Nigerian traders are taking over their jobs.

2.2 Migration and conflict

Per the new understanding of security, population movement is seen as being the cause of instabilities within states, as well as between states. According to Weiner (1993), international population movement leads to conflicts within receiving countries and between countries. Other authors have supported this notion by asserting that many conflicts arise due to tensions that exist between identity groups "which do not necessarily correspond with the existing nation-state boundaries" Goodhand and Hunter, (1999: 16 as cited in Ibrahim, 2005). Some authors have asserted that migration serves as a threat to security in societies when the incoming population is culturally different and of a different ethnic group from citizens; conflict is exacerbated when migrants refuse to acculturate in the host country (Buzan, 1993). Thus, multiculturalism is contemporarily increasingly seen as a threat to the culture and identity of the receiving countries. As a result of migrants being seen as the "other" by population in the receiving areas. Migrants compete for resources with locals and the fact that they are considered as "other" sometimes causes tension and conflicts due to resentment (Olzak, 2013). This fear of different ethnic groups not being able to interact and adapt in the host society has led to the belief that excluding migrants from the national identity will lead to having a homogenous society. This has triggered the emergence of policies aimed at controlling migration and its impact on populations.

Conflicts are one of the major drivers of migration; they also drive mobility due to the perception of insecurity (Sirkeci & Martin, 2014). Dahrendorf (1959 p.135), explains

conflict to encompass "a range of simple tensions, contests, competitions, disputes, explicit and latent as well as violent clashes and wars arising from incompatible differences in relations." Disputes, conflicts, Wars and the tensions they often result in forced migrations that create internally displaced persons and refugees of forced movement of people. The influx of large migrants often creates conflict between the countries of origin, transit and destination countries. Extreme ones are the conflicts experienced by many people in Iraq and Syria leading to mass movements (Sirkeci & Cohen, 2016).

Extreme conflicts lead to the mass movement of displaced people. In many parts of the world, there continues to be a large community of refugees. These refugees put pressure on both the community and available resources in the host countries. The refugees in turn experience insecurity from both communities and authorities (Abdi, 2005). The causes of conflicts in many a refugee community are due to environmental degradation, competition over scarce resources and the perception of criminal activities from the host community (Kumssa & Jones, 2014). For instance, at the Dadaab refugee camp located in Kenya, competition over scarce resources such as lands and natural resources with host residents has contributed to tension and conflicts among community members who are mainly pastoralists and refugees (Kumssa & Jones, 2014). The influx of refugees in host communities also raises concerns about criminal activities among refugees. This creates further tensions between the host community and refugees. Concerns such as inadequate food, access to healthcare, low income have all contributed to conflicts between host communities and refugees (Barnett & Adger, 2007; Kumssa, Williams, Jones, & Des Marais, 2014). Currently, migration has been the main issue in EU countries due to the refugee crisis in Syria and North Africa ((Aish & Almukhtar, 2015).

Environmental change and other environmental factors play a role in the migration-conflict nexus. In most developing countries, the population is extremely dependent on its natural resources to sustain their economic activities. The lack of another alternative source of livelihoods puts pressure on the environment which often leads to environmental migration (Myers, 1989; Reuveny, 2007). Climate change has the potential to increase the movement of people away from affected areas and will lead to increased tensions and conflicts with the populations in receiving areas or countries (Burrows & Kinney, 2016). Environmental degradation elements such as droughts and desertification lead to labour-related migration and contribute to ethnic conflicts between migrants and indigenous population. Desertification impacts on migration by increasing migration of farmers due to the drying of grasslands which results in conflicts between the migrants and indigenous owners of lands (Folami, 2013). In Africa, there is evidence that rural-urban migration due to demographic change often causes violent conflict as a result of increased scarcity (Goldstone, 2002).

In Nigeria and other littoral states of West Africa, the decreasing water levels of Lake Chad, drought and desertification have increased migration of various populations from Niger, Cameroon and Chad, especially the Fulani pastoralists, to the northeastern part of the Lake Chad Basin and the southern parts of the litoral states. This has led to the competition for the little resources available. It is believed that the receding of Lake Chad, inadequate resources and population movements have all contributed to the rise of Boko Haram (Onuoha, 2010; Osumah, 2013). Studies have also shown that long term exposure to harsh climatic conditions could affect the likelihood of conflict behaviour. Results of a study in Namibia indicated pastoralists who were exposed prolonged drought leading to resource

scarcity were more likely to display unacceptable or conflict behaviour (Prediger, Bjorn, & Benedikt , 2014).

The mobility of migrants into artisanal mining and panning operations sometimes disrupts the ecosystem destroying river bodies, therefore, affecting the already scarce resources. This could lead to tensions and conflicts between migrants and the indigenous population affected by the mining activities (Timberlake al, 2016).

2.3 Migration and Mining in Ghana

Ghana's history is replete with a history and tradition of population migration, often intensified during economic crises (Anarfi & Kwankye, 2003). The discovery of minerals and its subsequent extraction attracted many migrants from neighbouring African countries and outside Africa into Ghana in response to demands of labour and investment that the country needed (Awumbilla et al, 2014). The prospect of gaining mining-related opportunities such as employment is the main reason for labour migration in the mining sectors. These opportunities in the mining areas pull different types of entrepreneurs who want to access the different opportunities available (Araias, Atienze, & Cadamertori, 2013).

Migration in the mining sector in Ghana could be traced back more than a century ago. Labour migration from the neighbouring West African region played a significant role in the mining industry. The successful exploration and development in the mining industry triggered infrastructural developments in those mining areas. The demand for labour in the mining industry far exceeded supply due to indigenous people's unwillingness or inability to satisfy the labour demands (Adepoju, 2005; Nyame & Grant, 2007). According to

Ababio (1999), the development of the mining industry particularly the gold mines in Ghana, the shortfall in labour supply, as well as less stringent border controls all attracted many migrants from Gambia, Sierra Leone, Nigeria, and Togo, among others. Labour migrants from other West African countries who moved to the mining areas mostly outnumbered the indigenous people (Anarfi & Kwankye, 2003). Internally, many Ghanaians moved to the mining centres. They were attracted, in part, by the employment opportunities available in the mining sector. These included both skilled and semi-skilled as well as non-skilled labour migrants; all of which settled in the various mining centers (Awumbilla & Tsikata, 2001). The discovery of deposits of minerals like gold, manganese and diamonds combined with improvement of infrastructures like roads and railways facilitated immigration into these areas. Thus, migration movements into these areas were a natural reaction to the demands of labour due to the high reserves of minerals in these areas (Nyame & Grant, 2007).

In many communities, whose main source of livelihood is agriculture; the low yielding of crops, decreased soil fertility and other challenges associated with agriculture made the agriculture sector unattractive to them. The emergence of mining of both large scale and Artisinal small-scale mining served as motivation for the youth to migrate to the mining areas in search of better opportunities (Nyame & Grant, 2007). In recent years, thousands of Chinese nationals have migrated to rural Ghana and proceeded to engage in illegal extraction of gold. It is estimated that there are around 20 000 to 50 000 illegal Chinese miners in the country (Dong, 2013; Jiao, 2013). As of 2015, there were six legal major Chinese mining companies located in the country (Ayisi, 2013).

2.4 Types of mining

In Ghana, mining plays an important role in the development of the economy. The mining subsector contributed a total of GH¢17.1 billion to the country's GDP in 2017 (peacefmonline, 2018) and is now the largest producer of gold. Mining in Ghana is operated under two main types: the large scale mining (LSM) and Artisinal Small-scale Mining (ASM). These two opposing scales of operation have dominated the Ghana mining sector.

The large scale-mining creates major transformations on many different levels-social, economic, cultural and environmental. It is usually undertaken by big firms with many employees and a large labour force; they mine at large sites using and continues until the minerals are completely done. There are over ten large-scale mining who are multinationals operating in Ghana (Kansake, Kaba, Dumakor-Dupeyc, & Arthur, 2019). Technological advancement has rendered the large-scale mining sector less labour intensive with the introduction of extraction process like heap leaching; leading to an increase in surface mining (Yelpaalaa & Ali, 2005). This makes the large-scale sector as the largest contributor in the mining industry and Ghana as a whole.

The artisanal and small-scale mining (ASM) is made up of small-scale miners who are legally licensed to operate and are usually given a demarcated land to work on for 3-5 years (Appiah, 1998). Another strand of small-scale miners whose activities are not regulated and practice their trade without any license. These are commonly referred to as galamsey. It is estimated that more than 85% of small-scale miners are galamsey operators who have not registered with the various regulating institutions (Ofosu-Mensah, 2010). The distinction between these two is usually minimal and more often the two combined to refer

them as artisanal and small-scale miners (Nyame, Grant, & Yakovleva, 2009). The study, therefore, uses the term "small-scale" to refer to the two types. The small-scale has shown tremendous expansion since its first introduction. Ghana has over 300 registered small-scale mining groups (Hayford et al., 2008 cited in; Awuah-Nyamekye and Sarfo-Mensah, 2012).

Small-scale mining has contributed to the economy of Ghana through the creation of employment opportunities for the unskilled labour force that are mostly found in the mining communities (Kessey & Arko, 2013). Production of gold has increased from 11 percent in 2005 to 36 percent in 2013 and 2014 (Minerals Commission, 2014).

2.5 Mining and environmental security

Operations involving mining irrespective of the scales, whether large or small, are disruptive to the environment in general. According to Kessey & Arko (2013), the environmental deterioration caused by mining happens due to harmful and inappropriate activities. In all the stages of mining, each activity is potentially harmful to the environment, the culture and the people around.

Issues of land degradation and environmental burden issue from the mineral extraction from the land. According to Armstrong (2008), a significant two million acres of forested land are lost annually in Ghana due to surface mining activities which have had an impact on the rural communities through a reduction in the productivity of the agricultural lands. Mining activities have resulted in a shortage of food and cash crop production. Clearing of vast lands of forests, digging of trenches and the destruction of vegetations have all left lands exposed to several problems. The spread of surface mining has resulted in stream

pollution from the spillage of chemicals such as cyanide, acid and other waste disposals (Owusu-Koranteng, 2005). These stream pollutions have led to the deprivation of communities to access to water.

Surface mining leads to loss of livelihoods, income as well as a decline in food production; these socioeconomic factors have threatened household food security in rural areas (Armstrong, 2008). Other studies such as (Obeng-Odoom, 2013; Cobbinah, Poku-Boansi, & Peprah, 2017) have all raised concerns about the negative impacts of mining on local livelihoods such as the destruction of farmlands, the spread of water-borne diseases, and other health-related issues. Hilson (2002) points out that small scale gold mining continues to be one major contributory factor of mercury pollution to water resources in Ghana.

The mechanisation of gold production by small-scale miners has led to the destruction of a large tract of lands to make way for mining. This has affected both cocoa production and food production with an effect on food security in the country (Crawford and Botchwey, 2017).

2.6 Mining and conflicts

Recently, there has been increasing conflicts between the youth of mining communities and small-scale mining operators. For instance, reports indicating tensions between illegal Chinese who have been using heavy machinery and rural communities in Ghana (Howe, 2012). Mining industry's activities in Ghana have increased conflicts through their operations. Most of the times these conflicts include livelihood security, access to resources, ownership, use or degradation, environmental effects among others (Bebbington et al., 2008; Hilson, 2002, Kemp et al., 2010). These conflicts cut across both the large

scale mining companies and small scale companies. Among large scale miners in Ghana, in most cases relationship between mining companies and community members have been frosty due to sometimes the operational activities of the industry (Calvano, 2008). According to Hilson (2002), mining potentially destructive and causes irreversible damage. Often uncontrolled mining is a sensitive issue in communities and results in classes between the indigenes and the miners. The environmental impacts of mining are often catalysts for conflicts. Ghana has been beset with a history of conflicts in the mining sector for years.

About 10 years ago, ASM was a traditional activity was entirely an indigenous activity which involved traditional methods of extraction. From 2006 onwards, foreign miners from China and neighbouring countries started moving to Ghana to engage in small-scale mining (Crawford & Botchwey, 2017). The influx of Chinese migrants into the mining sites in Ghana led to competition over resources with indigenous people whose livelihood are mostly affected (Crawford & Botchwey, 2017). Besides, the acquisition of local lands without any regards for the socioeconomic impacts on the society by Chinese has led to outrage from indigenous people affected. These issues have the potential to lead to conflicts (Badu, 2012). Crawford and Botchwey (2017) explain that violent disturbances between indigenous people in the mining areas and Chinese miners have been on the rise since 2012. These include incidents where Chinese armed themselves with guns after being attacked by locals for destroying their farms. In 2013, there was a major clash in the Siana community that was fuelled by the local's disagreement with the Chinese practices. The report of the use of sophisticated weapons by Chinese migrants in protecting themselves against xenophobic attacks is a direct threat to national security. The influx of these

weapons into the country has several implications for national security. Apart from the few weapons being used by Chinese migrants for protection, the main national security threat stems from how these arms get into Ghana.

The Guardian Newspaper in a report on the activities of Chinese migrants in small- scale mining in Ghana stated that resentment towards foreigners,' especially Chinese nationals, is widespread in mining communities. The paper reports of frequent attacks by Ghanaians against increasingly heavily armed Chinese miners. The Chinese are also accused of assaulting Ghanaians they employ to operate their machinery.

2.7 Theoretical Perspectives

The theoretical framework of this study served as the bases upon which the study was conducted. These theories were selected because of their ability to explain the phenomenon under study appropriately. The study reviewed the sustainable livelihood framework and the securitization theory.

2.8 Sustainable Livelihood Framework

The Sustainable Livelihood seeks to explore ways a person or communities in a particular environment uses resources available to them and come out with livelihood strategies that will help them achieve a sustainable livelihood. These resources available most often than not are guided by some institutional rules and social norms. Livelihood outcomes are not always positive or sustainable (Ludi & Slater, 2008).

At the core of the Sustainable Livelihood, Framework is the various assets on which the individuals or households use for their livelihoods. These assets include things such as human capital, social capital, financial capital etc (Morse et al, 2009). These assets are

however influenced by external factors that could affect people's ability to earn a living. Thus, these influences include seasonality of livelihoods, trends and shocks that are outside the control of people. The framework identified livelihood intensification, diversification and migration as the broad groups of livelihood strategies people make use of to have access to assets available to them (Morse et al, 2009). Adopting a livelihoods approach will enable the study to broaden the analysis of the resources available to the communities being studied as well as the role external environment can have on the livelihoods of community members.

2.9 The Securitization Theory

The theory of securitization was first proposed by Ole Weaver in 1995 which sought to explain the security threats posed by migration. The main tenet of securitization theory is that the term security is an utterance speech act which automatically evokes action when mention is made. Thus, when the existence of a phenomenon threatens the existence of an object, any measure is taken to protect or ensure the survival of the endangered object (Waever, 2004). Huysmans (2006), talks about another school of thought which describes securitization as a process by which a threat to an object elicits a reaction to designed to remedy threats and curb the situation. Using this in respect of mining illegal can provoke one's action if the outcome is deemed consequential and can have an optimal effect on the environment and its inhabitants.

According to critics, securitization induces fear of violent deaths through sometimes the fabrication of existential threat; making it easier for governments to legitimize any action perceived to diffuse that existential threat (Aradau, 2001). This assertion can be seen in continual protestation of people affected by these illegal activities for such issues to be

resolved. If such means which is one of the ways to inform authority fails, indigenous in those affected areas devise their strategies which sometimes becomes life and death. The securitization issues could be a political, economic and social issue such as terrorism, immigration or conflict.

Migration has been known to be a security issue that could lead to tensions, conflicts as well as the implementation of anti-immigration laws (Ibrahim, 2005). Thus, the theory of securitization is much relevant to this study as it explores the security threats posed by migrants in Ghana and the potential remedies. This is appropriate in exploring the potential threats posed by migrants in the mining sector particularly small-scale miners.

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1 Introduction

This chapter covers the methodology used to explore the specific objectives the study set out to achieve. The objectives of the study include examining the level of migrants' involvement in illegal mining, and the impact migrants' mining activities have on communities. The chapter focuses on the study area, the method adopted to collect data, sampling method employed, data analysis, and the ethical issues of the study. The chapter concludes with limitations that the researcher encountered during the data collection.

3.2 The study area

The Western Region is one of the most active mining regions in Ghana with a high number of both large-scale mining and artisanal small-scale mining (Ghana Statistical Service, 2013). The Western Region represents more than half of the total large scale gold mining in Ghana. It has approximately 396 of the 1,342 registered small scale mining companies in Ghana ((Owusu-Nimo, Mantey, Nyarko, Appiah-Effah, & Aubynn, 2018; Ghana Chamber of Mines, 2015). These mining activities serve as a motivation factor for illegal small scale mining.

The Amenfi West District is one of the twenty-two districts in the Western Region (with its capital as Asankragua). It is bound to the west by Sefwi Wiaso and Aowin Suaman districts, to the south by Jomoro and Ellembele and north by Bibiani and Bekwai. The district is surrounded by important rivers notably among them are the Suro river and the Tano River. The rivers are used as a source of irrigation by farmers particularly vegetable

farmers during the dry season (MOFA, 2015). The main economic crops grown in the district are Cocoa, Rubber, Oil Palm, Citrus and Kola. Cocoa alone constitutes about 80% of farmers' income and scattered all over the district. Rubber constitutes about 12% and is concentrated in Manso Amenfi zone and few communities around the Asankrangwa and Samreboi zones. The District is associated with the part of Ghana's gold belt, namely Asankrangwa- Manso- Nkwanta which is associated with the Birimain rocks. The area is also rich in minerals such as Bauxite, Manganese, and iron-ore. The District's gold reserves which require extensive exploration serve as a pull factor that draws both locals and migrants to engage in small- scale mining. Active galamsey villages and towns within the Amenfi West district are Asankragua, Odakotoumso, Adaase, Asankransaa, Odakotoumso and AboiNkwanta (MOFA, 2015).

3.3 Research Design

The study adopted the mixed-method approach due to the multiplicity of issues the study sought to cover. The study, therefore, used both a survey and interview to gather data for the study. It adopts both quantitative and qualitative methods for data analysis. The quantitative approach was adopted to obtain a large number of responses to find out the extent to which illegal mining activities affect the study area and its inhabitants. The qualitative approach, on the other hand, focused on key informants interviews from people such as opinion leaders, youth association heads among others who had adequate knowledge of mining and its implications for security. The use of both quantitative and qualitative method of data collection provides a broader understanding of issues and research problems (Teye 2012; Lopez-femandev et al, 2011; Creswell, 2009). Both

methods were used to complement the strengths and weaknesses of each other thereby reducing any bias and increasing the validity of the research findings (Bryman, 2007).

3.4 Target population and Sampling technique

The target population for the study were both the indigenes and migrant miners in Adaase. They were selected from migrants who are involved in the mining activities in Adaase and have been living in the community for at least a year. Indigenes of Addase were also part of the target population. For the survey, indigenous were the main target population who constituted mainly males and females of different ages, educational backgrounds and marital status. The sample size for the study consisting of 105 respondents was selected. The sampling procedure involved two stages. Firstly a screener survey approach was used to select households in the community who engaged in mining and its related activities with the help of an opinion leader and numbers were assigned to those households which constituted 400 households in all. The second stage of the sampling procedure involved the use of simple random sampling techniques. To start the random process, the numbers assigned to each household were written on a piece of cardboard and place into a bowl. Afterwards, the researcher picked the first number and this continued until a sample size of 105 was obtained. This sample size was used because of time and financial constraints. This random technique gave the respondents in the population equal opportunity to be included in the sample and also to ensure fair representation of the population (Branner, 2005: Bourke, 2014).

With regards to the qualitative interview, purposive sampling technique was used in identifying migrant miners engaged in mining at Adaase. According to various scholars, the purposive sampling technique is a deliberate choice to select a person or a group of

people with certain qualities. Purposive sampling gives the researcher the ability to select respondents with enough knowledge on the issue under study (Bernard, 2002; Tongo, 2007). Purposive sampling was employed in interviewing 7 migrant miners. This was to assist respondents to give detailed information based on their knowledge about the subject matter under consideration. The interview type was semi-structured to give respondents the freedom to express themselves. Questions on all aspects of small-scale mining g issues such as mode of operations, land acquisitions, and so on were explored.

3.5 Sources of Data

Data collection is important in research as it aids the researcher to better discuss the phenomenon being studied (Bernard, 2002). It is therefore crucial that the method selected in obtaining data is done carefully and effectively. For a researcher to obtain the objectives of the research, it is imperative to use an appropriate method for data collection. The data was obtained from two main sources; the primary sources of data collection were obtained through the use of an interview guide and questionnaires and the secondary data sources included existing literature from books journals and other scholarly sites such as google scholar, Wikipedia, yahoo search, among other internet sources. This facilitated the work of the researcher in his initial stage of study as well as aiding in the design of the questionnaire and interview guide.

3.5.1 Mode of Primary Data Collection

Before the administration of the questionnaires, pre-testing was done at Akwatia in the Eastern region of Ghana to enable the researcher to check the validity of both the questionnaire and interview guide. Akwatia was chosen because similar mining activities take place there. In all, 30 respondents were used for the pre-testing. This pre-test also

helped the researcher to minimize the likelihood of having questions that did not measure the objectives and made it difficult for respondents to understand.

3.5.2 Questionnaire Survey

Among the quantitative research instruments, a questionnaire is the most appropriate for effectively measuring and analyzing numerical data. A questionnaire could be described as a research instrument consisting of a series of questions posed to individuals to obtain useful statistical information about a given topic (Mellenbergh, 2008). The quantitative data were made up of close-ended semi-structured questionnaires. With the questions, respondents were given a range of options from which they select the most appropriate answer from it. This was structured to gain responses in the following areas;

- social-demographic characteristics of the respondents; and
- effects of immigrants into mining business on environmental security.

3.5.3 In-depth Interview

In a qualitative interview, in-depth interviews allow the researcher to gain extra information from respondents because their responses are based on their experiences and perception of the particular phenomenon being studied (Turner, 2010). Thus, in this study, an in-depth interview guide was used to collect data from both indigenes and migrant miners to provide the researcher with well-rounded information for data analysis. Using qualitative interviewing, the researcher gained detailed information from the interviewee about specific events. The guide focused on themes such as;

- Perception of small-scale operation mining in the community
- Impact of migrants' mining activities on communities

- Level of migrants' involvement in illegal mining

3.6 Data Analysis

Data analysis is necessary because it helps in cleaning and transforming the information for final analysis. The purpose of data analysis is to reduce and transform the data collected to its smallest and interpretable form so that the relations of the research problems can be tested, and conclusions drawn from it. Based on this, the information gathered from the field was organized and analysed both quantitatively and qualitatively.

3.6.1 Quantitative data analysis

After a questionnaire administered to respondents was obtained each questionnaire was coded and analysed using the SPSS. In quantitative research, features are classified, counted and a statistical model is applied to explain what has been observed. Given this, data for the analysis were presented, explained and discussed using descriptive statistics such as frequencies, tables, graphs and percentages. The application of quantitative analysis enabled the researcher to generalize the findings and make comparisons between the two variables. Finally, quantitative analytical approaches also allowed the researcher to report the summary of the results of the study in numerical terms.

3.6.2 Qualitative data analysis

In-depth interviews were recorded using the audio recorder and all interviews were carried out in English and Twi as those were the common languages both researcher and respondents could communicate. The final output was presented in the form of texts and direct quotes from respondents. The application of this method of analysis by the researcher is based on the fact that the original views of respondents will be demonstrated without any

biased interferences of the researcher. Hence it was easy to transcribe without altering most of the meanings to the response given by the respondents. The interviews were then coded and put into themes according to the objectives of the study.

3.7 Ethical Consideration

During the period of the study, ethical principles were complied with as they served as a safeguard in ensuring that the dignity, right, safety and wellbeing of all the participants in the research are respected (Babbie and Mouton, 2002; cited in; Luci, 2012). Respondents were informed about the intent of the research study as well as the benefits of participating in the research. The researcher obtained an introductory letter from the Center for Migration Studies together with his student identity card proved the genuine intention of the researcher is researching for academic purposes only. After the presentation of the introductory letter and student identity card, the respondents granted the interview. They were again informed about the use of audio recorders and the publishing of the interviews. Thus, issues such as objectivity, confidentiality and respecting the privacy of respondents were all respected.

At no point during the study, did the researcher impose issues on participants regarding the participation of the study. Respondents were informed of their ability to stop the interview or refuse to answer any question if they felt uncomfortable or thought their rights were infringed upon. Data collected were stored and handled professionally to ensure that respondents' identity was not exposed. The benefits of the research being conducted were explained to the respondents thoroughly.

3.8 Limitations

All research encounter challenges and this study was not different. These limitations include inadequate resources in terms of time and money. Travelling to the study area required money whereas more time was spent with community members to study the phenomenon. Another challenge encountered was the seeming lack of cooperation from the miners and indigenes to partake in the study. Due to the clampdown of illegal mining by the government, many of the miners were reluctant to grant interviews to the researcher for fear of being victimised or arrested. Others also thought that it was for political reasons which made it difficult for them to cooperate. However, things became relaxed when the researcher showed them his introductory letter as well as the student id card. This shows the importance of having some form of identification when embarking on fieldwork.

CHAPTER FOUR

4.1 Introduction

This section presents an analysis of the data gathered from the field on the background of characteristics, respondent's views on the level of immigrant's participation in illegal mining and the effect of mining activities in the communities. The first section discusses the socio-demographic characteristics of respondents including sex, age, level of education and occupation, among others. The second section further presents analysis and discussions on immigrants' participation in the mining sector and its implication on environmental security. Subsequently, the mining effects on water sources, changes in the environment and its impact on farming activities will be thoroughly examined in this chapter. Furthermore, the next section will analyse and discuss the relationship between some demographic variables and experiences encountered on dust pollution, water sources and ways mining affect farming activities. The qualitative section of the research explored the level of migrant's involvement in small-scale mining at Adaase as well as the impact of their activities on the community.

4.1.1 Sex composition of respondents

Table 4.1 shows that, out of the total respondents (105), 67 (63.8%) were males while 38 (36.2%) were females. The disparity between males and females could be attributed to farming and small-scale mining associated with the study area

Table 4.1: Sex of composition of respondents

Sex	Frequency	Percent
Male	67	63.8
Female	38	36.2
Total	**105**	**100.0**

Source: Field data, 2019

4.1.2 Age of respondents

Out of the 105 respondents sampled, majority of the respondents were within the age cohort of (26-43) years. The finding further reveals that a significant proportion (64.8%) of the respondents falls within the working-age of 26 to 43 years which constitute a youthful population in the study area. The Table also ascertained that the rest of the age cohorts were less than ten (10) percent of the total sampled population.

Table 4.2: Age of respondents

Age	Frequency	Percent
20-25	10	9.5
26-31	14	13.3
32-37	30	28.6
38-43	24	22.9
44-49	10	9.5
50-55	6	5.7
56-61	5	4.8
62-67	2	1.9
68+	4	3.8
Total	**105**	**100.0**

Source: Field data, 2019

4.1.3 Educational status of respondents

Educationally, the table revealed that, out of the sampled population, two-fifth (40.0%) of the respondents have had education up to middle/JHS/JSS level. Respondents who attained primary and secondary/SSS/SHS recorded 21.0 and 20.0 percent respectively. The rest of the respondents' educational levels were less than ten (10) percent. This evidence is an indication that the sizeable proportion of the respondents have some level of education although the highest was the high school level.

Table 4.3: Educational status of respondents

Educational status	Frequency	Percent
No education	9	8.6
Primary	22	21.0
Middle/JHS/JSS	42	40.0
Secondary/SHS/SHS	21	20.0
Voc/Comm/Tech	4	3.8
University/Tertiary	7	6.7
Total	**105**	**100.0**

Source: Field data, 2019

4.1.4 Marital status of respondents

Information on marital status is presented in Table 4.4. The Table indicates that more than two-fifth (42.9%) of the respondents were married followed by those who were single, in consensual union and separated constituting 19.0, 12.4 and 11.4 percent respectively. The distribution of the marital status gave credence to the fact that the rest of the respondents were less than ten (10) percent

Table 4.4: Marital status of respondents

Marital status	Frequency	Percent
Single	20	19.0
Never married	4	3.8
Consensual	13	12.4
Married	45	42.9
Separated	2	1.9
Divorced	12	11.4
Widowed	9	8.6
Total	**105**	**100.0**

Source: Field data, 2019

4.1.5 Occupation of respondents

With respect to respondents' occupation within the study area, more than two-fifth (43.8%) of the respondents were into small-scale mining while farming as an occupation constituted 27.9 percent. This finding confirms the claim made by the Ghana Statistical Service (2010) that the study area is predominantly a mining community. The rest of the type of occupations engaged in by respondents were less than ten (10) percent of the total responses. One respondent and a worker in the study area had this to share:

"In this community, every youth who have stayed or continue to stay here is either a small-scale miner or a farmer. There's no better work because the majority of us didn't go far in school so we cannot do the work you are doing. We have no option than to farm or go into galamsey" **(Respondent 3).**

Table 4.5: Occupation of respondents

Occupation	Frequency	Percent
Retail	8	7.6
Wholesale	2	1.9
Manufacturing	1	1.0
Hospitality industry	4	3.8
Small-scale mining	46	43.8
Artisan	5	4.8
Public servant	6	5.7
Farmer	29	27.9
Unemployed	3	2.9
Others	1	1.0
Total	**105**	**100.0**

Source: Field data, 2019

4.1.6 Percent distribution of occupation by gender

Gender composition of respondents with regards to their occupation was ascertained. With respect to the male population, the two most essential occupation patronized in the study area were small-scale mining and farming where those into small-scale mining were 9 times (41.8% - 32.8%) more than the farmers and this could be attributed to the income generation in mining activities as compared to that of farming. A similar outcome was obtained from the female population. The rest of the occupations of both sexes were less than fifteen (15) percent of the total responses. However, there was no significant association ($\chi 2 = 9.804$, df = 9 and p-value = 0.367> 0.05) between one's sex and the likely occupation engaged in. This assertion is consistent with (Lahiri-Dutt, 2011) who explicated that, mining activities as an occupation is not only patronized by both sexes irrespective of

the location, the risk involved and the energy demands but by the high wages associated with it.

Table 4.6: Percent distribution of occupation by gender

Occupation	Sex of respondent		Total
	Male	Female	
Retail	4 (6.0%)	4 (10.5%)	8 (7.6%)
Wholesale	2 (3.0%)	0 (0.0%)	2 (1.9%)
Manufacturing	1 (1.5%)	0 (0.0%)	1 (1.0%)
Hospitality industry	1 (1.5%)	3 (7.9%)	3 (3.8%)
Small-scale mining	28 (41.8%)	18 (47.4%)	46 (43.8%)
Artisan	4 (6.0%)	1 (2.6%)	5 (4.8%)
Public servant	3 (4.5%)	3 (7.9%)	6 (5.7%)
Farmer	22 (32.8%)	7 (18.4%)	29 (27.6%)
Unemployed	1 (1.5%)	2 (5.3%)	3 (2.9%)
Others	1 (1.5%)	0 (0.0%)	1 (1.0%)
Total	**67 (100.0%)**	**38 (100.0%)**	**105 (100.0%)**

$\chi 2 = 9.804$, df = 9 and p-value = 0.367> 0.05)

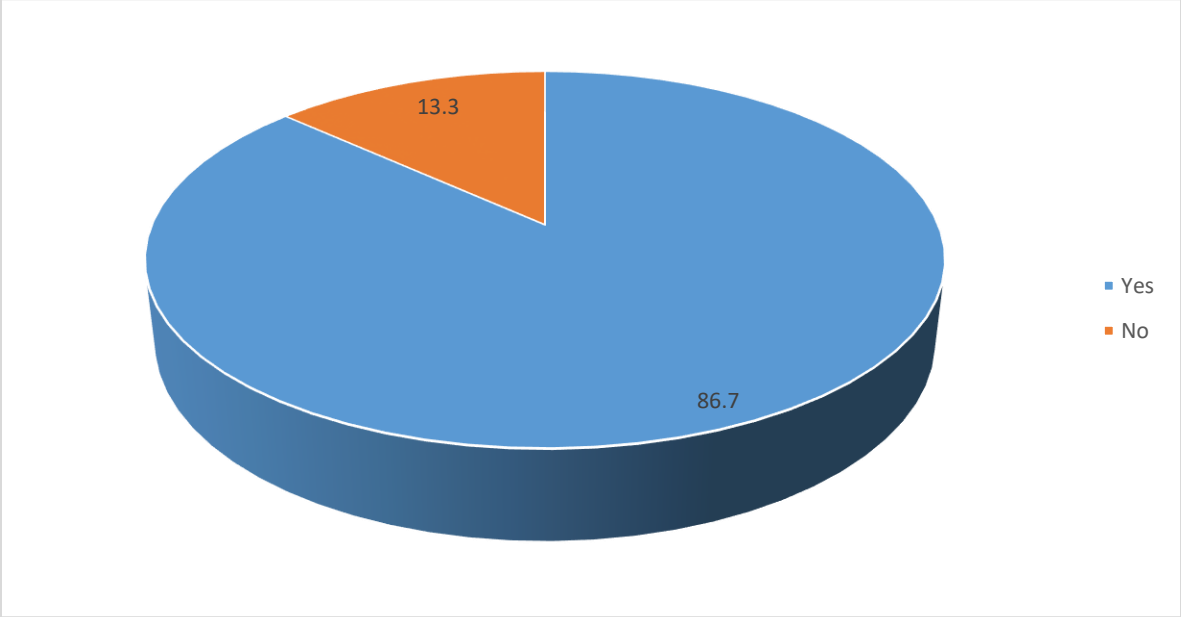
Source: Field data, 2019

4.1.7 General knowledge on illegal small-scale mining

Respondents' awareness of illegal small-scale mining activities was explored. It was evident that an overwhelming majority (86.7%) cited yes to such activities in the study area while the rest stated otherwise (13.3%). The general implication is that a large section of the respondents is in the know with regards to illegal mining. One respondent had this to share:

"Oh *as for that one everybody in this community knows..it's not even in this community alone that knows. Why did you come here? Because you know that illegal mining activities take place here by both foreigners, other people from other towns and even those of us from this town but you cannot condemn it because it is the job most of us do to feed our families"* **(Respondent 4)**

Figure 4.9.7: General knowledge of illegal small-scale mining



Source: Field data, 2019

4.1.8 Perceived presence of illegal miners and their nationality

The presence of illegal miners in the study area, as well as nationals involved in such activities, were ascertained. Out of the 105 respondents sampled, more than three-quarters (76.2%) responded yes to illegal miners in the area while a little over a fifth (23.8%) cited no. However, with regards to other nationals engaging in these activities, foreigners were 4 times (28.8% - 25.0%) more than Ghanaian illegal miners but a combination of foreigners and Ghanaians constituted 46.3 percent of the total sampled population. The general

implication is that illegal mining activities are instigated by the help of the indigenes which makes it difficult to tackle. An opinion leader in the area had this to say:

> *"Illegal mining operation is not new in this area and is patronized by both foreigners and Ghanaians (Indigenes) who help the foreigners with manpower and general knowledge of the mining area to extract minerals illegally*." **(Respondent 4)**

This finding is consistent with Armah et al., (2013) which pointed out that, illegal mining becomes intensified when indigenes collaborate with foreigners to illegally mine minerals.

Table 4.7: The perceived presence of illegal miners and their nationality

Variables		**Frequency (N = 105)**	**Percent**
Presence of illegal miners	Yes	80	76.2
	No	25	23.8
Total		**105**	**100.0**
Nationals involved	Ghanaian	20	25.0
	Foreigners	23	28.8
	Both	37	46.3
Total		**80**	**100.0**

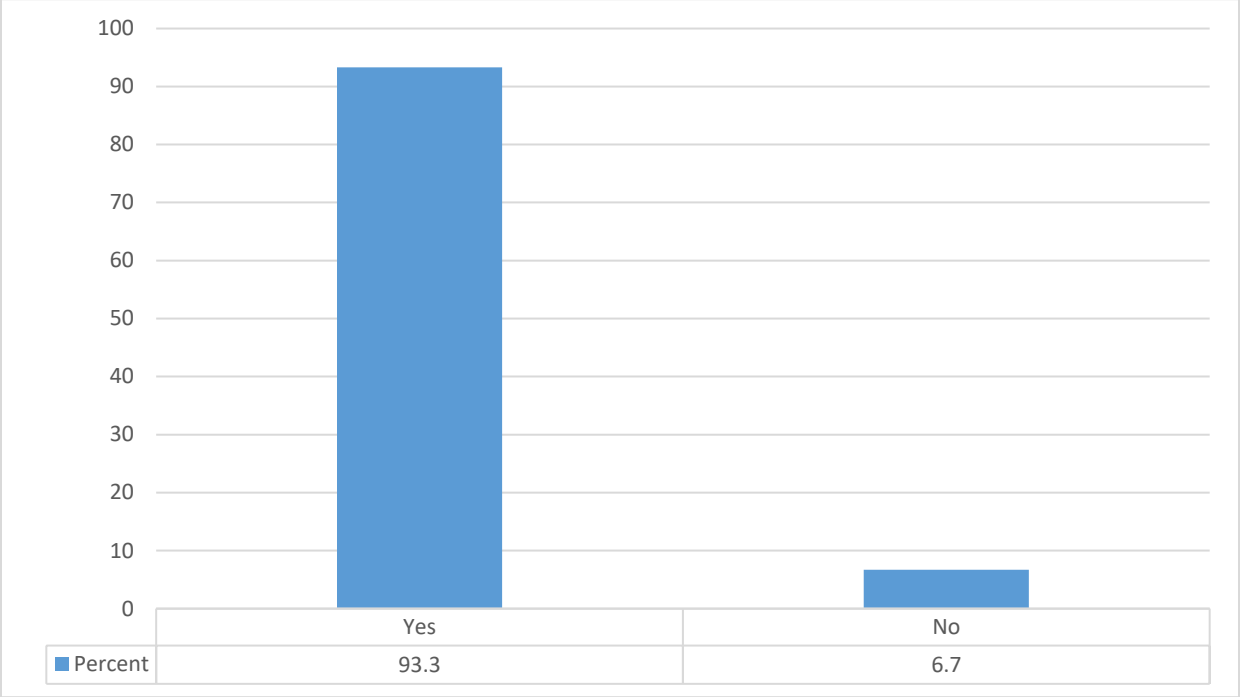
Source: Field data, 2019

4.1.9 Effect of illegal miner's activities on people and the environment

Environmental effects as a result of illegal mining operations were explored. Figure 4.9.8 shows that an overwhelming majority (93.3%) of residents mentioned yes to such effects while just a few (6.7%) stated no to any environmental effects. According to some of the respondents during an in-depth interview, at times breathing becomes difficult due to the dusty nature of the environment which leads to discomfort and reddish eyes in most cases. This observation made by respondents is in line with Okyere (2013) and Kwakyewah (2018) studies on mining activities on the environment and its implications on the people where he expounded that, continuous illegal mining activities or non-compliance of mining rules affect the environment and the people living in such places negatively. One respondent shares a similar sentiment:

> *"These galamsey people are destroying our land for us. The moment they hear there is gold somewhere, they just go in and start to destroy our lands and waters. It is right now that our water is now getting clean bit by bit. At first, it was so bad that we could not even use it for anything". (***Respondent 2)**

Figure 4.9.8: Effect of illegal miner's activities on people and the environment (Figure)



Source: Field data, 2019

4.2.0 Changes in the environment as a result of surface mining

Globally, surface mining brings a lot of changes to the environment (Hentschel, Hruschka & Priester, 2002), especially when not managed well. In ranked order, respondents were of the view that changes in the environment as a result of surface mining are reduction in the forest (30.4%), water bodies pollution (14.5%), mosquitoes and malaria, other forms of diseases (13.5%) and changed in landforms (13.5%). According to the respondents, these were some of the immediate effects observed. As cited by some environmentalists (White, 2013), continuous mining of lands without proper regulations leads to the

destruction of vegetation which impacts negatively on the environment and the livelihood of the people. One farmer had this to share:

> *"This improper way of mining on our lands has destroyed all our crops and those left don't even get the required nutrient due to the chemicals use by these miners. Aside that, many of the water bodies have been polluted making it difficult for domestic usage. All they cared about was their gold. They just give the farmers small money and start to destroy all the farms. Most of them are done by the Chinese who have money. They have destroyed so many cocoa farms around here and the old people who usually do the farming cannot also do mining, so they end up not having anything left". (***Respondent 6)**

Table 4.9: Changes in the environment as a result of surface mining

Changes in the environment	Responses (N = 105)	
	N	Percent
Reduction in forest	88	30.4
The disappearance of animals and birds	35	12.1
Altered rainfall patterns	38	13.1
Change landforms	39	13.5
Mosquitoes and increase in malaria, other forms of diseases	39	13.5
Water bodies pollutions and death of fishes	42	14.5
Others	8	2.8
Total	**289**	**100.0**

Source: Field data, 2019 ** Multiple responses

4.2.1 Cross-tabulation between changes in the environment due to surface mining and gender

Respondent's view in terms of sex on the changes in the environment due to surface mining was ascertained. Among the male population, more than four-fifth (83.3%) cited a reduction in forest reserves followed by the disappearance of animals and birds (39.4%). The rest of the changes in the environment were more than a third except for waterbodies pollution (31.8%). Similar outcomes were obtained by the female population, but higher among females than males. One female farmer had this to share:

> *"I was born and raised here. Currently am 50 years old and a lot of changes has happened to our environment. Just look at our water bodies the colour has changed*

completely, and you cannot do anything with it. Majority of the people here buy sachet water for many domestic activities". ***(Respondent 7).***

Table 4.9: Cross-tabulation between changes in the environment due to surface mining and gender

Changes in the environment	Sex of respondent	
	Male	Female
Reduction in forest	55 (83.3%)	33 (86.8%)
The disappearance of animals and birds	26 (39.4%)	16 (42.1%)
Altered rainfall patterns	23 (34.8%)	15 (39.5%)
Change land forms	23 (34.8%)	16 (42.1%)
Mosquitoes and increase in malaria, other forms of diseases	22 (33.5%)	17 (44.7%)
Water bodies pollutions and death of fishes	21 (31.8%)	14 (36.8%)
Others	4 (5.9%)	5 (13.2)

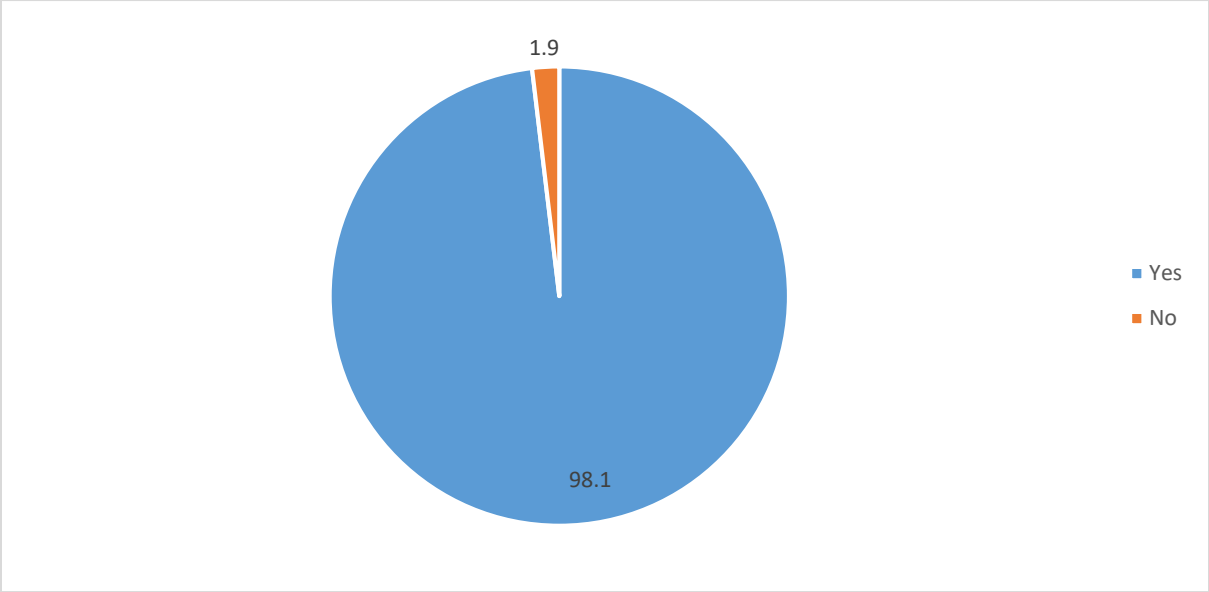
Source: Field data, 2019 ** Multiple responses

4.2.2 Experiencing dust pollution from mining operations

Figure 4.9.9 present information on whether respondents experience dust pollution from mining activities. It was evident that a large proportion (98.1%) of the respondent mentioned yes while just a few (1.9%) cited no to such experiences. According to Latifovic et al., (2005), mining activities are associated with dust pollution due to the nature of its activities such as deep and surface casting. This assertion was alluded by one opinion leader who had this to say:

"Our untarred roads also contribute to dust pollution in this area but the majority of the dust comes from illegal mining activities engaged in by foreigners and Ghanaians." ***(Respondent 4)***

Figure 4.9.9: Experiencing dust pollution from mining operations (Figure)



Source: Field data, 2019

4.2.3 Respondent's experiencing effects of dust pollution from mining

Out of the 105 respondents sampled, more than two-fifth (47.6%) cited the constant experience of dust particles in the air while more than a third (39.0%) were of the view that the surroundings were full of dust as well as dust on vegetation (10.5%). The rest of the experiences encountered by respondents to dust pollution were less than two (2) percent.

Table 4.9.1: Respondent's experiencing effects of dust pollution from mining

Experiencing effects from dust pollution	Frequency	Percent
Dust in the surroundings	41	39.0
Dust particles in the air	50	47.6
Dust on vegetation	11	10.5
No idea	2	1.9
Others	1	1.0
Total	**105**	**100.0**

Source: Field data, 2019

4.2.4 Percent distribution of experiencing dust pollution from mining by gender

A gender perspective on experiences encountered as a result of dust pollution was explored. Among the male population, those who cited dust particles in the air were 9 times (49.3% - 40.3%) more than those who mentioned dust in the surroundings. Within the same population, the rest of the experiences were less than ten (10) percent. Similar experiences were also encountered with respect to the female population. However, there was no significant association ($\chi 2 = 4.680$, df = 4 and p-value = 0.322> 0.05) between one's sex and experiences encountered due to dust pollution, however, it is higher among males than females. This could be attributed to the fact that dust pollution affects everyone irrespective of your sex. One mineworker in the study area had this to share:

> *"I do some of the mining here because there are no jobs for the youth, it is either you migrate or engage in illegal mining. We must survive but our activities affect*

this community negatively especially the water sources and the dusty environment. Always you see people covering their nose with handkerchiefs and I sometimes feel some way about it but cannot change it because it is the same job I feed my family".

(Respondent 5)

Table 4.9.2: Percent distribution of experiencing dust pollution from mining by gender

Experiencing dust pollution	Sex of respondent		Total
	Male	Female	
Dust in the surroundings	27 (40.3%)	14 (36.8%)	41 (39.0%)
Dust particles in the air	33 (49.3%)	17 (44.7%)	50 (47.6%)
Dust on vegetation	6 (9.0%)	5 (13.2%)	11 (10.5%)
No idea	0 (0.0%)	2 (5.3%)	2 (1.9%)
Others	1 (1.5%)	0 (0.0%)	1 (1.0%)
Total	**67 (100.0%)**	**38 (100.0%)**	**105 (100.0%)**

($\chi 2 = 4.680$, df = 4 and p-value = 0.322> 0.05)

Source: Field data, 2019

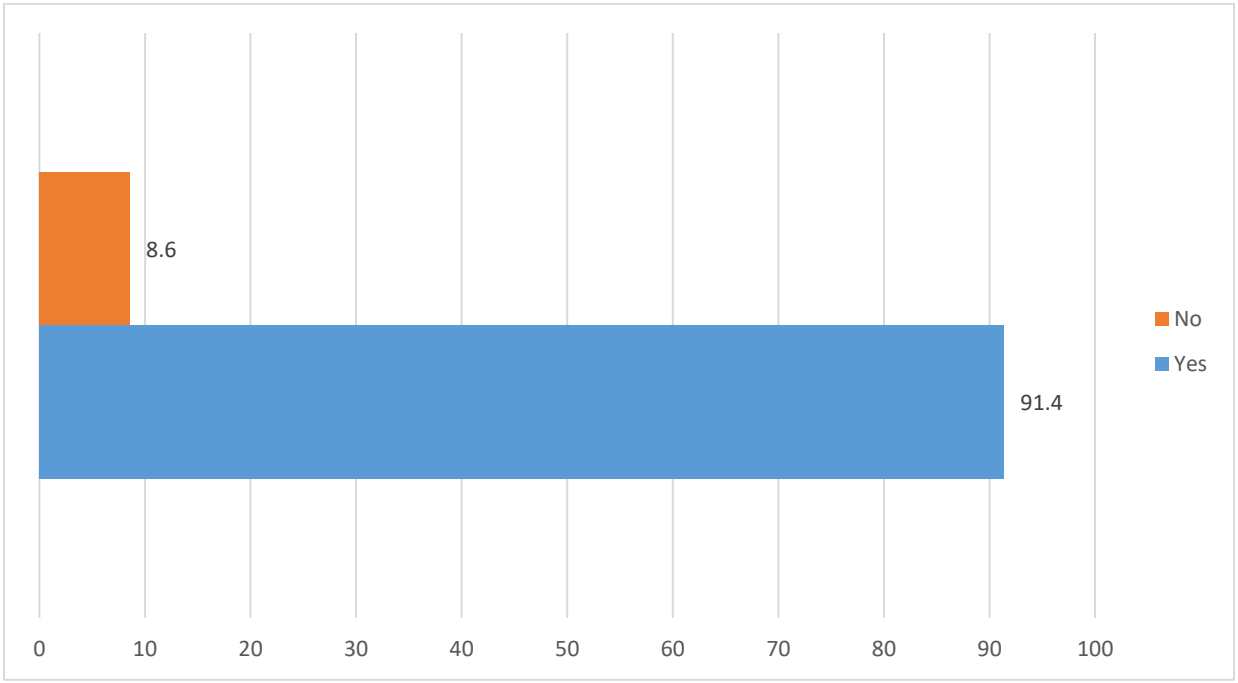
4.2.5 Effect of mining operations on water sources or streams

In the wake of minimizing illegal mining activities by the government of Ghana (Inter-ministerial committee of Ministry of Interior, 2017), respondent's view on the nature of water sources or streams were ascertained. Out of the study population, the majority (91.4%) cited that mining activities affect water sources or streams while the rest (8.6%) mentioned no to such effects. The outcome emanating from Figure 4.9.91 agrees with (Warhurst & Noronha, 1999; Al Mamun, Howladar & Sohail, 2019) who expounded that

non-regulated mining operations affect water bodies through pollution as a result of surface mining and introduction of chemicals in the search for precious minerals in water bodies. One respondent had this to share:

> *"You see, the thing is we use water from the river to mix with our insecticides and other chemicals to spray our farms. But the water is already affected by those chemicals from the illegal mining so when you spray on your crops it kills the crops and cocoa trees".* **(Respondent 1)**

Figure 4.9.91: Effect of mining operations on water sources or streams



Source: Field data, 2019

4.2.6 Bivariate analysis between mining effects on water sources or streams and gender

Bivariate analysis between mining effects on water sources or streams and gender were explored. Among the male population, an overwhelming majority (91.0%) cited yes to the fact that mining operation affects water sources while nine (9) percent mentioned no to such effect. However, similar findings were obtained with regards to the female population. The outcome further shows a similar pattern where those who responded yes for both males and females were more than those who said no. There was no significant association ($\chi 2$ = 0.35, df = 1 and p-value = 0.852> 0.05) between mining effect on water sources and one's sex. The general implication is that a section of the respondents perceived that mining activities affect water sources irrespective of your gender. One female farmer had this to share:

> *"Getting clean water in this community is very difficult. We mostly rely on boreholes which are not in abundance making farming and other domestic works very challenging to do. The effect of mining activities on our water sources affects everybody."* ***(Respondent 5).***

This assertion is supported by Gedicks (2001) and Telmer et al., (2006) who mentioned that key resources that are affected mining activities are water sources since a chunk of the minerals are deposited at the banks of the rivers within the communities.

Table 4.9.3: Bivariate analysis between mining effects on water sources or streams by gender

Mining effects on water sources or streams	Sex of respondent		Total
	Male	Female	
Yes	61 (91.0%)	35 (92.1%)	96 (91.4%)
No	6 (9.0%)	3 (7.9%)	9 (8.6%)
Total	**67 (100.0%)**	**38 (100.0%)**	**105 (100.0%)**

($\chi 2 = 0.35$, df = 1 and p-value = 0.852> 0.05)

Source: Field data, 2019

4.2.7 Ways mining operations affect water sources or streams

Globally, mining effect on water sources can be apportioned differently due to the extent of the effects on a community and its livelihood (Kunanayagam & Young, 1998; Orr, Cartwright & Tickner, 2009) if not well managed. In ranked order, respondents views on how mining affects water sources were ascertained. Out of the sampled population, pollution of water or streams sources constituted a little over two-fifth (41-3%) followed by sedimentation of stream/river (28.3%) and reduction of groundwater (23.3%). According to the respondents, the natural resource affected most by mining activities is water sources. This finding is consistent with Hook (2018) who explicated that indigenes within mining areas complain of the destruction of water bodies whenever mining activities surface. One of the respondents the study interviewed had this to share:

> *"We as members of this community would have been okay with mining activities if our water sources are not destroyed which makes life difficult here. Everything*

you will do with the water you must first filter the water using chemicals like alum or buy water outside which comes with a cost." ***(Respondent 6).***

Table 4.9.4: Ways mining operations affect water sources or streams

Ways mining operations affect water or streams sources	**Responses (N = 105)**	
	N	**Percent**
Pollution of water or stream sources	92	41.3
Sedimentation of water/ streams	63	28.3
Reduction of groundwater	52	23.3
Others	16	7.2
Total	**233**	**100.0**

Source: Field data, 2019 ** Multiple responses

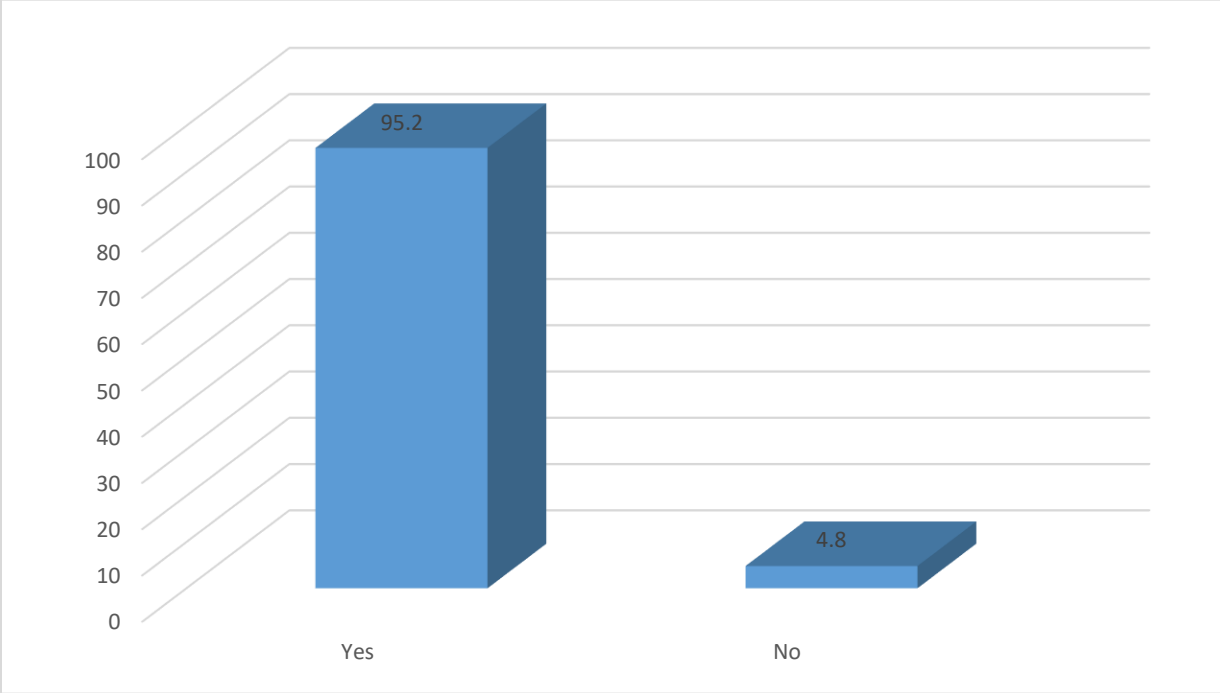
4.2.8 Illegal mining effects on farming activities

Aside the small-scale mining, farming activities is the most patronized occupation in the study area (Table 4.5). Respondents view on whether illegal mining affect farming activities were explored. Figure 4.9.92 shows that a larger proportion (95.2%) of the respondents mention yes to illegal mining affecting farming and its related activities while just (4.8%) cited no to such effects. This outcome confirms similar work done on mining activities in Eastern part of Congo which explained that most farming lands are lost to mining activities which affect livelihoods (Geenen, 2014; Cuvelier et al., 2014). A male farmer had this to share in that regard:

"Most of the land I farm on have been taken for mining activities which have affected my farming income and my livelihood whenever it comes to the proceeds I

*make out of farming. The truth is the miners pay more money so now you cannot get people to come and work on your farms unless you are willing to match what the mining people are paying. But I cannot so you end up not doing much the whole year." (**Respondent 1)***

Figure 4.9.92: Illegal mining effects on farming activities



Source: Field data, 2019

4.2.9 Percent distribution of illegal mining effect on farming activities by age

A cross-tabulation between respondents ages and illegal mining effect on farming activities were ascertained. With regards to those saying mining affect farming activities, half (51.0%) of them falls within the age cohort of (32-43) years followed by those aged between (26-31) years constituting thirteen (13) percent. The rest of the age cohorts who mentioned yes were ten (10) percent and below. Among respondents who mentioned no to such effects on farming activities, two-fifth (40.0%) falls within the age group (38-43)

years while those within the age group (26-31) years, (32-37) years and 68 years and more constituted just one-fifth (20.0%) of the total responses. However, age did not play any role when it comes to one's view on the effect of illegal mining on farming activities since there was no statistical relationship established ($\chi 2 = 6.248$, df = 8 and p-value = 0.620> 0.05). The general implication is that farming activities suffer from mining in the study area irrespective of one's age; either a farmer or an indigene. An opinion leader who doubled as a farmer expresses his view in that regard:

> *"I have been a farmer since I completed middle school and continue to be a farmer but not on a large scale again because of mining activities. These mining operations affect farming activities in so many ways but the most significant one is money since the who can be paid higher amount get the land for whichever purpose and this is how come many of the lands here are in foreign hands who use it for mining activities either legally or illegally."* ***(Respondent 4).***

Table1 4.9.5: Percent distribution of illegal mining effect on farming activities by age

Age of respondents	Illegal mining effect on farming activities		Total
	Yes	No	
20-25	10 (10.0%)	0 (0.0%)	10 (9.5%)
26-31	13 (13.0%)	1 (20.0%)	14 (13.3%)
32-37	29 (29.0%)	1 (20.0%)	30 (28.6%)
38-43	22 (22.0%)	2 (40.0%)	24 (22.9%)
44-49	10 (10.0%)	0 (0.0%)	10 (9.5%)
50-55	6 (6.0%)	0 (0.0%)	6 (5.7%)
56-61	5 (5.0%)	0 (0.0%)	5 (4.8%)
62-67	2 (2.0%)	0 (0.0%)	2 (1.9%)
68+	3 (3.0%)	1 (20.0%)	4 (3.8%)
Total	**100 (100.0%)**	**5 (100.0%)**	**105 (100.0%)**

($\chi 2 = 6.248$, df = 8 and p-value = 0.620> 0.05)

Source: Field data, 2019

4.3.0 Ways in which illegal mining affect farming

Ways in which illegal mining operations affect farming were explored. Out of the sampled population, more than two-fifth (43.9%) cited losing their lands to mining activities followed by soil degradation (24.7%) and reduction in forest cover constituting 20.7 percent of the total responses obtained. This outcome according to the respondents has decreased food production in the area resulting in the purchase of foodstuffs from different districts. One farmer who took part in the in-depth interview had this to share:

"I used to produce enough foodstuffs but now I don't because I don't have vast land for cultivation due to rampant mining activities as well as enough water for the crops…sometimes the farms get flooded by the water and since most of the times the water have chemicals in it, it ends up killing our cocoa trees." ***(Respondent 2).***

Table 4.9.6: Ways in which illegal mining affect farming

Ways illegal mining affect farming	Responses (N = 105)	
	N	Percent
Land took over by mining activities	87	43.9
Soil degradation	49	24.7
Reduction in forest cover	41	20.7
No idea	5	2.5
Others	16	8.1
Total	**198**	**100.0**

Source: Field data, 2019

4.4 Level of migrants' involvement in the mining activities

This section sought to understand the level of migrants' involvement in the mining activities. This includes their method of access into the small-scale mining, the process of acquiring land for mining as well as the method they use for mining.

Respondents explained that almost all foreign nationals who come here have people in the community leading them. They believe these migrants receive the backing of some stakeholders in the community due to the money they have. According to respondents, migrant miners were influenced by the indigenes who were already into the mining. Migrant miners established contacts with the locals in the community who knew the terrain

of Adaase and it was through them they had access. The influence of a local person is a major determinant of migrants' willingness to enter small scale mining. Below are some quotes from some respondents;

"You see, these Chinese and Nigerians you see here today, they didn't just walk into the town like that oo...What they usually do is to look for one of the young guys in town who is already into mining and start to work with them. The local person will be the one doing all the groundwork for the migrants." **Respondent 3**

"Sometimes too, they let the local people take them to the chiefs and since they come with a lot of money it becomes easier for the chiefs to give them permission to start to work" ***Respondent 5***

In terms of access to land by migrants, respondents indicated that most of the miners acquired it from the local chiefs after receiving some amounts of money from them. Other respondents also indicated that farmers are sometimes contacted directly by migrant miners who entice them with money and buy their lands. This is what some respondents had to share.

"A lot of times, the lands are sold by the chiefs. What happens is that the miners come to the chiefs and because the chiefs all they want is money, they don't even hesitate and lease the lands to them." ***Respondent 7***

"They don't even need to go see the chief, now they just go look for the owner of the lands and give them plenty money, so they also decide to sell the lands to them. They don't even care about the future" ***Respondent 6***

The responses given by respondents about the lands is confirmed by Nyame and Blocher (2010), who reported that even though the state is supposed to regulate the minerals in the country, the land tenure system of the country is controlled by chiefs who are the main custodians of the land and therefore have the authority to sell it. This facilitates small-scale mining in Ghana.

4.5 Security impact of mining

One of the themes the study sought to explore was the security impact of mining by migrants at Adaase. The study, therefore, sought the view of respondents on how mining is impacting the community members. The involvement of migrants in the artisanal gold mining has increased agitations among indigenes as well as farmers in the area. According to respondents interviewed, there have been some clashes between the locals and migrants particularly, the Chinese, whose activities have impacted them. The conflict usually stems from these migrants' method of practice which mostly harms the environment. Below are some quotes from respondents;

"Most of the people who used to come here to do the galamsey were Chinese and they had a lot of money. So they had money to buy big equipment to use it but these machines were destroying our lands so we didn't like that. Sometimes, the farmers would confront them and when you do they threaten you with guns. I remember we even went on protest to demand their removal. Because of their money, they could even bribe the police people so that they do not bother them. So the youth it got to a point didn't even like seeing the police around. **Respondent**

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter presents a summary of the study's major outcomes in relation to the objectives of the study. It also provides a conclusion base on the outcome of the study. Lastly, some recommendations are made based on the outcome of the study.

5.1 Summary

The study examined the security and environmental implication of immigrant's activities in the mining sector of Ghana from the perspective of the indigenes. Regarding the study area, 105 respondents were selected randomly in addition to an in-depth interview with 7 respondents. The key findings are discussed below;

The findings indicate that a higher percentage of the respondent (63.8%) were males within a workable age cohort of about (26-43) years old constituting a youthful population with significant proportion having to attain basic education. From the study, it was evident that foreigners were 4 times (28.8% - 25.0%) more than Ghanaians who were into mining with an overwhelming majority (93.3%) citing the effect of illegal mining on the environment.

With regards to the changes observed in the environment due to surface mining, a significant proportion of the respondents mentioned reduction in forest cover (30.5%) and pollution of water bodies (14.5%). The study further revealed that dust pollution was enormous (98.1%) due to the intense dust particles in the air (47.6%). According to the respondents, key resources affected as a result of mining activities in the study area were water sources or streams as well as farming activities. The extent of damage to these key

resources was the pollution of water or streams and land taken by mining activities constituted more than two-fifth of the total responses. Again, further analysis based on the extent of immigrant's mining activities with respect to gender saw both sexes having unanimous responses but higher among females than males on issues of polluted water bodies, farming activities as well as environmental changes due to surface mining.

The land tenure system in Ghana in which chiefs have the authority to sell lands has influenced artisanal and small-scale mining activities. The findings showed that migrants such as the Chinese capitalise on these laws and acquire mineral-endowed areas without the approval of the state, and this continues to promote small-scale mining. The mining activities by both migrants and indigenes in the community cause both environmental and national security. The major environmental security caused by small-scale mining is the destruction of farmlands and vegetation as well as polluted water which affects the crop yields and livelihoods of the community.

The study in its entirety pointed out the indigenes perspective of illegal mining activities and how they affect them negatively with regards to major resources.

5.2 Conclusion

Based on the findings of the study, it was concluded that indigenes (respondents) perception about immigrants mining activities were generally negative as it affected key resources such as lands, water bodies and farming activities. The effects of mining on specific resources rendered indigenes in the study area with no option than to purchase water for domestic usage due to polluted streams. Dust pollution (dust particles in the air)

was on the increase and led to complaints of chest and eye problems as stated by the respondents.

The findings found out that, mining activities were not done alone by foreigners but in conjunction with a section of the indigenes who have in-depth knowledge on lands and how to get access to resources.

Finally, the effect of mining on farming activities affected the livelihood of the people since the majority lost their lands to mining resulting in low farming income. This was evident since the two-most important occupations in the study area were small-scale mining and farming. A gendered perspective on the effect of mining activities on key resources obtained unanimous responses for pollution of water sources and changes in the environment but higher among females than males.

5.3 Recommendation

This section of the dissertation makes the following recommendations.

- Government of Ghana through the district assemblies and the coordinating councils should ensure strict compliance of the mining regulation to minimize illegal mining which affects most of the key resources in the study area.
- Government of Ghana should further sanction foreigners who operate in small-scale mining since it is limited to Ghanaians only by law yet foreigners collaborate with a section of Ghanaians to engage in such activities. Agencies set up to control mining activities should be resourced to avert such situation which destroys water bodies, forest covers among others

- Mining concessions granted to foreigners should be looked at again by the mineral commission since the majority of the foreigners into mining activities have less experience and contribute to numerous challenges face in the mining sector. This, when done, will streamline their activities and reduce the negative impact it comes within the mining communities.
- Provision of education and other technical support to the small scale miners should encourage as there were regulatory initiatives which were established by the government in 1989 as a legal framework seeks to streamline and facilitate the licencing and provision of technical support to the miners.

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APENDICES

APPENDIX A

UNIVERSITY OF GHANA, LEGON

CENTRE FOR MIGRATION STUDIES (CMS)

My name is Paul Ayiah Hammond a Master's Degree student at the Centre for Migration Studies, University of Ghana, Legon. I am undertaking a research for my thesis as part of the requirements for M.A in Migration Studies. The thesis aims to understand the security and environmental implications of immigrants' activities in the mining sector of Ghana. Your input is very essential for the success of this thesis. Whatever information you will give will be handled confidentially and as such will not be distributed to a third party; it will be used only for academic purposes.

SECTION A: SOCIO-DEMOGRAPHIC BACKGROUND OF RESPONDENTS

1. Age on last birthday …….

2. Sex: 1=Male [ ] 2=Female [ ] 3=Others [ ]

2. Educational Level

a. Formal 2=Primary [ ] 3=Middle /JSS/JHS [ ] 4=Secondary/SSS/SHS [ ] 5= Vocational/Commercial/Technical [ ] 6=University/Tertiary [ ]

b. Informal

1=No Education [ ]

3. Marital status?

1. Never Married [ ] 2=Informal/Consensual [ ] 3=Married [ ] 4=Separated [ ] 5= Divorced [ ] 6=Widowed [ ] 7= Single [ ]

4. Occupation

1=Retail [ ] 2=Wholesale [ ] 3=Manufacturing [ ] 4=Transportation [ ] 5=Hospitality Industries [ ] 6= Small scale mining [ ] 7= Artisan [ ] 8= Public Servant [ ] 9= Farmer[ ] 10= Unemployed[ ] 11=Others [ ]

SECTION B: EFFECTS OF IMMIGRANTS INTO MINING BUSINESS ON ENVIRONMENTAL SECURITY

5. Are you aware of illegal small-scale mining?

1. Yes[ ] 2.No [ ]

Do you know some people who are illegal miners?

1. Yes[ ] 2.No [ ]

Are those working in the illegal mines Ghanaians, foreigners or both?

1= Ghanaians [ ] 2=Foreigners [ ] 3=Both

In your view do the activities of illegal miners have any effect or impact on the environment, people and the communities?

1. Yes[ ] 2.No [ ]

6. What are the changes you have observed in the environment since the introduction of surface mining?

1. Reduction in Forest Land [ ] 2. Disappearance of animals and birds [ ] 3. Altered rainfall pattern [ ] 4. Changed land forms (big gullies, stripped hills, reduced mountain size) [ ] 5. Mosquitoes and increase in malaria, other forms of the diseases [ ] 6. Water bodies pollution death of fish [ ] 7. Other (please specify).....

7. Do you experience dust pollution from the mining operations?

1. Yes[ ] 2.No [ ]

8. If yes, how do you experience it?

1. Dust in surroundings [ ] 2. Dust particles in the air [ ] 3. Dust on vegetation [ ] 4. Other (please specify)……

9. Do you think the mining operation has affected your streams or water sources?

1.Yes [ ] 2. No [ ]

10. If yes, in what ways

1. Pollution of streams/water sources [ ]

2. Sedimentation of streams/rivers [ ]

3. Reduction of ground water [ ]

4. Other (please specify).....

11. Has the mining activity affected your farming activities?

1.Yes [ ] 2. No [ ]

12. If yes in what ways?

i. Land taken over by the mining activity [ ]

ii. Soil degradation [ ]

iii. Reduction in forest cover [ ]

iv. Other (please specify).....

APPENDIX B

IN-DEPTH INTERVIEW GUIDE

1. What is your general opinion on small- scale mining operations in your community?

2. How will you describe the relationship between miners and the local community?

3. Do you experience conflict or tensions between miners and locals? If yes can you give examples of such conflicts you have witnessed?

4. What is your general opinion on the effects of small-scale mining operations on the environment?

4. What are some of the problems you face living in this area? Please tell me about your security problems; conflicts between miners and local community

5. Do small-scale miners use mining income to invest in sustainable livelihoods for the local communities?

6. To what extent do immigrants participate in small scale mining in the area?

7. Are you comfortable with activities on immigrants in the area?

8. Are the activities of the immigrants worsening the poverty situation in the area?

9. What effects do the immigrants business activities have on the farmlands?

10. What action have community taken to address the challenges activities of immigrants in the area?

11. What is the demographic of the immigrants?