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SOCIO-ECONOMIC EFFECTS OF LARGE-SCALE GOLD MINING ON LOCAL COMMUNITIES IN GHANA: A CASE OF UPPER DENKYIRA WEST DISTRICT

BY

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DECLARATION

I, Mercy Ackah, do hereby declare that except for references cited in this work, which have been Duly acknowledged, this work 'Socio-Economic Effects of Large-Scale Gold Mining on Local Communities in Ghana: A Case of Upper Denkyira West District' is the result of my own research.

It has not been presented anywhere, either in part or whole for the award of any degree.

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DEDICATION

I dedicate this work to my father, Mr. Francis Ackah, my late mother Mrs. Theresa Agyapomah and late supervisor, Prof. Paul William Kojo Yankson

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"Trust in the Lord with all thine heart; and lean not unto thine own understanding, but in all thy ways acknowledge him and he shall direct your paths" (Proverbs 3:5-6 KJV). All the glory be unto the Lord. The completion of this thesis would not have materialized without the help of some people whose efforts are immensely appreciated.

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ABSTRACT

The utilisation of renewable and non-renewable natural resources is an integral part of most economies for economic growth. Gold as a non-renewable resource is obtained through excavation. The entire process of obtaining gold has been identified to have both positive and negative socio-economic effects on local communities. In Ghana, the era of industrialization and globalization has encouraged mining companies both local and multi-national in the mining sector since the 1990s which has led to expansion in the economy Ghanaian. In 2014, Perseus Mining Ghana Limited which is a large-scale mining company and the focus of this study, acquired large acres of farmlands to execute their activities. The company after the acquisition compensated the community as a whole and the individuals who were affected as well.

The study was guided by 3 objectives: the first was, to analyse the differences in economic outcomes of large-scale mining on a host, resettled and nearby non-mining communities; the second was to, investigate the differences in social effects of large-scale mining on a host, resettled and non-mining communities; and the third, to examine the institutional support systems available to the community and individuals and to find out how the locals adapt to the negative effects of mining on their livelihoods. The study employed the mixed method approach by conducting a cross sectional household survey of three communities and conducting focus group discussions and key informant interviews. 350 household heads were selected using systematic random sampling for the survey and six focus group discussions were organized for two groups from each community. In addition to the focus group discussions, six key informant interviews were conducted. Analysis of the quantitative data was done by using descriptive and explanatory analysis. Thematic analysis was used for the qualitative data.

The findings of the study show that the activities of large-scale mining have caused both positive and negative socio-economic effects on the livelihoods of the three communities studied. The positive effects were the generation of employment, infrastructural development and scholarships schemes to students to further their education. However, negative effects such as loss of livelihoods, food insecurity, displacement, increased social tension, increased social vices, high cost of living and health effects such as cough, cold and skin rashes were reported. The study also found out that institutional support systems present in the communities which helps the communities to maximise benefits from the mines were, traditional authorities, community support group, a support group of the mining company and government agencies. To cope with the adverse effects of the mines, respondents adopted several coping strategies such as acquiring alternative farmlands from nearby communities, ventured into other livelihoods such as trading, bought foodstuffs from nearby communities which were cheaper, used ointments to treat skin rashes and demonstrations to show their displeasure. The study recommends the provision of alternative livelihoods for affected households, the establishment of an efficient grievance redress centre by the mines, and periodic stakeholders' engagement collaboration among government agencies.

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LIST OF ACRONYMS

AGC	Ashanti Goldfields Corporation
ALP	Alternative Livelihood Programme
ASM	Artisanal and Small-scale Mining
CEIA	Center for Environment Impact Analysis
CSR	Corporate Social Responsibility
DFID	Department of International Development
EIA	Environmental Impact Assessment
FC	Forestry Commission
EPA	Environmental Protection Agency
ERD	Economic Recovery Programme
FAO	Food and Agricultural Organisation
FC	Forestry Commission
FGD	Focus Group Discussion
GHEITI	Ghana Extractive Industries Transparency Initiative
GDP	Gross Domestic Product
GRA	Ghana Revenue Authority

GSA	Geological Survey Authority
GSS	Ghana Statistical Service
HHS	Household Hunger Scale
ICMM	International Council of Mines and Metals
IDMC	Inspectorate Division of Minerals Commission
IFRCRCS	International Federation of Red Cross and Red Crescent Societies
ISSER	Institute of Statistical, Social and Economic Research
KII	Key Informant Interview
KPMG	Klynveld Peat Marwick Goerdeler
LSM	Large Scale Mining
LVB	Land Valuation Board
MC	Mineral Commission
MLNR	Ministry of Lands and Natural Resource
MDF	Mineral Development Fund
MIDR	Mining Induced Displacement and Resettled
MIID	Mineral Income Investment Fund
NGO	Non-Government Organisation
OASL	Office of the Administrator of Stool Lands

PMLG	Perseus Mining Ghana Limited
PMMC	Precious Minerals Marketing Corporation
SMS	Small Scale Mining
SLA	Sustainable Livelihood Approach
SL	Sustainable Livelihood
SLF	Sustainable Livelihood Framework
SPV	Special Purpose Vehicle
WHO	World Health Organisation

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

According to the World Bank (2005), one of the essential assets that could stimulate economic growth and spur social infrastructure development is mineral wealth. Dillon and Barret (2015) stated that most African countries rely on mining activities to support their economies. They further assert that Africa's export-oriented mining and quarrying is driven primarily by the commodity hunger of the world's largest economies. In most African countries, such as Algeria, Equatorial Guinea, Libya, and Nigeria, minerals contribute not less than 90 percent of the export earnings ((Hailu & Kipgen, 2017; Oluwatayo & Ojo, 2016). More so, Dube and Vargas (2013) posited that commodity export revenues contribute significantly to the growth and enhancement of developing countries' economies and living standards.

Africa has for the past decade experienced a boom in its minerals industry. As a result, government finances, exports, and hope for a sustainable growth trajectory have increased significantly for mining countries on the continent (Kotsadam and Tolonen (2015). Data from the World Bank (2015) stipulates that mine openings on the continent have also increased tremendously over the years. Despite the spurred growth in the mining sector resulting in a boom in Africa's resource, it remains unclear whether living standards have been enhanced. Poverty reduction, emanating from the growth of mineral resources in Africa, is much lower than in the rest of the world. The low Growth elasticity of poverty (GEP) could be attributed to the natural-resource-led growth, a basis for the dissatisfaction that is frequently felt following a natural-resource-led boom. For instance, Zambia, a major copper producer, recorded an unchanged incidence of poverty between 2000 and 2010, despite a doubling of economic output (Chuhan-Pole, Dabalen, & Land, 2017). Beegle,

Christiaensen, Dabalen, and Gaddis (2016) also assert that most resource-rich countries on the African continent such as Angola, Gabon, and Nigeria usually record low non-monetary welfare indicators compared to non-resource-rich countries, revealing an unmet potential of natural resource wealth. Again, Beegle et al. (2016) revealvedthat non-resource rich countries' literacy rates are 3.1 percentage points higher than resource-rich countries while malnutrition is less prevalent among children and women by 3.7 and 2.1 percentage points, respectively as compared to that of resource-rich countries.

The dissatisfaction is all too familiar () at the national level; nonetheless, there is an increasing concern about whether local mining communities benefit from the resource boom or not, and if don't understanding the possible reasons accounting for the situation is required (Tolonen, 2015). Some authors have pointed out that host communities where mining activities take place are more likely to have access to better communication technology, banking services and access to electricity. Other benefits include access to health, education, human resource development, scholarships schemes for affected communities and roads construction. Some also are, jobs, and technology transfer in general, as compared to resettled communities and other nearby non-mining communities that may be affected by the operations of the mining companies (McPhail, 2009; Tei Mensah et al., 2017; Tolonen, 2015).

However, Aragon and Rud (2015) and Singh (2015) studies alluded that the adverse effects of mining on host communities, include, deterioration of the environment and health implications due to the wrong working practices. They also identified water, and air pollution, social displacement through relocation, land degradation, loss of farmlands and food insecurity as some of the effects. Other literature identified the adulteration of local cultures and decreased land for agriculture as adverse effects.

Some studies have been done to assess the health impact of mining on local communities and the emergence of various defiant behaviours such as prostitution (Cohen, 2014; Eldoret & Chancery, 2013; Opoku-Ware, 2014; Wikle, 2014). For instance, it has been established that prostitution and sexual promiscuity have led to the spread of HIV/AIDS (Eldoret & Chancery, 2013; Williams, 2014). Again, various environmental effects of mining, such as water pollution and air pollution, have been linked to asthma, cough, cold and chronic bronchitis within the local communities (Boohene & Peprah, 2011; George, 2013). According to Aragón, Chuhan-Pole and Land (2015), there are three (3) main channels through which the effect of the activities of mining companies on host communities could be felt. These are income and employment; the central government as the owner of the resources on behalf of the people and finally through externalities.

Their explanation is that, direct employment of local workers by the mining companies and the patronage of locally produced goods and services have the potential to increase nominal wages and other incomes, and generally enhance local welfare and reduce poverty. On the other hand, the presence of these mining companies in the local communities could also attract foreign workers and workers from other districts and regions of the country. This could cause a dramatic upward change in wages and hence exert pressure on local facilities and services such as health and education, causing a rise in the prices of non-tradable goods and services making life unbearable for most indigenes. In the case of the government acting as the owner of the resource on behalf of the people, human welfare such as health and education are likely to be enhanced if the dividend is utilised efficiently to advance the quantity or quality of local public goods and services.

Additionally, considering that public goods are productive inputs or create positive spill overs, a resource boom could also increase local income and growth as in transport infrastructure. On the other hand, as the central government bags all the revenues, the local community may not benefit significantly as the funds are apportioned according to criteria and priorities unrelated to the

location of mines or the source of the funds. Finally, regarding externalities as another channel, there could be positive spill overs from the mining companies, which could come in the form of enhancements to productivity through worker training and education, as well as public goods through investment in roads, bridges, ports, and similar facilities, which are required by the extractive industry. Nevertheless, there could also be negative externalities such as pollution, congestion, pressure on other scarce natural resources, and social dislocation. From these issues, it is clear that the presence and operations of mining companies in host communities have a socioeconomic impact on the local communities within which they operate, which could be positive or negative (Aragón, Chuhan-Pole & Land 2015).

In dealing with some of the negative impacts of mining mentioned above, institutions, communities, individuals, and households find different means to lessen the adverse shocks and stress of mining on their livelihoods. Research has indicated that mining communities, in dealing with the negative effect of mining, such as loss of jobs, high cost of living, land degradation and health impact, develop different strategies to cope with the externalities of mining (Bhattarai 2005). Coping strategies are heavily deployed and practised by poor households and communities affected by mining activities. Some indigenes move from subsistence farming to trading in goods and services; others secure farmlands in nearby communities to start up new farms, while others change their consumption patterns like reducing the number and quality of foods or meals and postponing entertainments. (Bhattarai 2005).

Ghana is one of the privileged countries in Africa endowed with mineral resources such as diamond, manganese, bauxite, and gold which has contributed to the country's socioeconomic development since the colonial period. The first authentic account of gold in Ghana dates back to 1471, when trade in the precious metal between the Gold Coast and Europe began (Agbesinyale, Dankwa and Tenkorang 2012). Mining accounts for about 9.1% of Ghana's gross domestic product

(GDP) and employs almost 300,000 people (Ghana Statistical Service, 2015). According to the 2018 report of the Ghana Chamber of Mines, GDP from the Mining quarrying sub-sector in Ghana increased to 8.01 million USD (GHS 36.06 million) in 2017 from 5.46 million USD (GHS 24.58 million) in 2016. The report indicates that GDP from mining in Ghana increased to 9.68 million USD (GHS 43.57 million) in the second quarter of 2018 from 12.77 million USD (GHS 57.48 million) in the first quarter of 2018. Its contribution to direct domestic revenue improved from 36.67 million USD (1.65 GHS billion) in 2016 to 48 million USD (GHS 2.16 billion) in 2017, representing a growth rate of 31 percent. In 2017, the largest source of direct domestic revenue mobilised by the Ghana Revenue Authority (GRA) was from the mining sector (Ghana Chamber of Mines Report, 2017).

Nonetheless, all these gains are national and may have no direct impact on the local communities (Aragón, and Rud, 2015). However, research shows that negative impacts of exploitation of natural resources are more felt at the local level than at the national level (Aragon and Rud, 2015; Kotsadam and Tolonen, 2015; Land et al., 2015). Research by the World Bank, 2015 on the socioeconomic impact of mining on local communities in Africa, notes that one of the effective channels through which local communities could benefit from the mining activities is direct employment by the mining companies as well the indirect effects through linkages with other sectors.

1.2 Problem Statement

As much as mining activity contributes to the development of Ghana through the payment of royalties to the central government of Ghana, the local communities that serve as the host communities enjoy only 10% of these royalties, which are channelled through the Mineral Development Fund (MDF) for developmental projects (Baffour-Kyei, Mensah, & Owusu, 2018). However, the local communities that serve as the host communities are bedevilled with social,

economic and environmental challenges and are characterised by pervasive and endemic poverty due to the vast lands taken over by mining companies which is the key source of livelihood for indigenes (Opoku-Ware, 2010).

Large-scale mining acquires large tracts of arable lands meant for farming by indigenes of communities where most activities of LSM takes place which affects food production and sometime results in food insecurity (Hilson et al; 2014). Most indigenes in rural areas where large-scale mining activities take place are predominantly farmers. Farmlands are lost to mining companies although affected households are compensated in cash or provided with alternative livelihoods (Opoku-Ware, 2010). Moreover, agriculture is the mainstay of the Ghanaian economy accounting for approximately 60% of labour force (Akabzaa and Darimani, 2001). Negative social and economic problems associated with large-scale mining activities such as unemployment, food insecurity, social vices, social tension. reduced incomes and health implications affects the livelihoods of rural dwellers. In Ghana, there are approximately 19 operating mines and over 100 local and foreign companies of which some are mergers with other mining companies as well as expanding their scope of operations in 4 regions of the country: namely Ashanti, Eastern, Western and the Brong Ahafo Region respectively. The activities of these companies have affected the farmlands of over 30 thousand local communities (Garvin et al, 2009). This means, local community members would have to seek /construct alternative livelihoods to make a living as farming has been their main source of sustenance. The adoption of livelihood strategies/ coping mechanisms is therefore key to the construction of livelihoods and livelihood outcomes within an ever changing social, institutional, political, economic and environmental context where people strive to make a living (Ellis and Ade Freeman 2005) hence communities and households affected negatively by mining activities initiate or develop strategies for alternative livelihoods to cope with mining impact to enhance their lives. (Bhattarai 2005). Some authors have stated that the various

authorities such as government and traditional authorities responsible for Ghana's mining sector who are supposed to help affected communities cope with the negative effects of mining have failed to live up to their responsibilities in making sure that mining communities are 8 not worse off due to LSM (Harrison, 2010, Hilson et al, 2014 and Jonsson & Fold, 2011). On this background, this study will also examine the institutional support systems available in the selected communities.

Though studies have been conducted to assess the socioeconomic impact of mining, most of these focused on some African countries in the past years. These include works of Gajigo, Mutambatsere, & Mdiaye, 2012; Polat, Atakke, Aran, Dabalen, Chuhan-Pole & Sanoh, 2014 in Tanzania and Mali, Musokotwane, 2016 in Botswana and Tanzania). For the studies that focused on Ghana specifically, most focused on environmental impact assessments (e.g. Baffour-Kyei, Mensah & Owusu, 2018; Kapstein & Kim, 2011; Mensah, Mahiri, Owusu, Mireku, Wireko, & Kissi, 2015; Obiri, Mattah, Mattah, Armah, Osae, Adu-Kumi, & Yeboah, 2016; Opoku-Ware, 2010). Little is known in these research outputs about comparison among host, resettled due to mining operations and non-mining communities as far as the socioeconomic impacts of mining on livelihoods are concerned. This study seeks to analyse the livelihood strategies/coping mechanisms adopted by local communities thus making an analytical comparison of issues that will emerge from the study and recommend appropriately. This will be done using Perseus Mining Glhana Limited (PMGL) as a case study which is one of the current mining concessions which were granted by the government of Ghana 2013. The company commenced its gold production in early 2014.

To this end, this study seeks to explore the socio-economic effects of large scale gold mining on local communities in the Upper Denkyira West district, with critical focus on a mining community (an active mining community, Ayanfuri), a resettled community (Kurofofrom) and a community

near to the mining catchment area (Nkutonsu) to ascertain if there varies the socio-economic effects of PMGL on the selected communities.

1.3 Aims and Objectives

The main aim of the study is to examine the socioeconomic effects of large-scale gold mining on local communities in Ghana by focusing on Ayanfuri (active mining community), Nkutonsu (nearby non-mining community) and Kurofofrom (resettled community) in the Upper Denkyira West District in the Central Region of Ghana. To achieve the central aim, the study specifically seeks to:

1. Investigate the differences in economic outcomes of large-scale mining on the host, resettled and non-mining communities.
2. Analyse the differences in social outcomes of large-scale mining on the host, resettled and non-mining communities.
3. Examine the institutional support systems available and local adaptation strategies adopted by the households to curb the adverse effects of mining on their livelihoods on the host, resettled and non-mining communities.

1.4 Research Questions

The study will find answers to the following questions:

1. Are there differences in economic outcomes of large-scale mining on the host, resettled and non-mining communities, which could be used as a basis for policymaking regarding mining operations?
2. Are there differences in social outcomes of large-scale mining on the host, resettled and non-mining communities to serve as a basis for resource allocation?

3. What are the institutional support systems available for affected households in the host, resettled and non-mining communities to help minimize the negative effects of mining on the local communities?
4. What are the local adaptation strategies adopted by the households in the host, resettled and non-mining communities to enhance their livelihoods and the effectiveness of these strategies in ensuring the development of the communities?

1.5 Justification of the study

Studies done in Ghana on the socio-economic impact of mining on local communities (Mensah and Okyere, 2014; Tenkorang and Osei-Kufuor, 2014) did not focused on how resettled households or communities fared but rather the focus has been on the mining communities or remaining communities. This study is therefore needed to fill this gap by assessing the socio-economic impact of mining activities on mining communities, resettled communities and nearby community to ascertain comparatively possible variations of the impacts of mining on their wellbeing.

Again, most research on mining in Ghana has concentrated on small scale mining and illegal mining, probably because of a belief that it is more harmful to the environment and causes more social problems since most of their activities are illegal compared to large scale mining (Adjei, 2007; Opoku-Ware, 2014; Baffour-Kyei, Mensah, and Owusu, 2018). However, it is reported that large-scale gold mining also comes with environmental, health and socio-economic issues although their activities are legal since they are given license by the Minister of Lands and Natural Resources on behalf of the government of Ghana (Baffour-Kyei, Mensah and Owusu, 2018; Mensah and Okyere, 2014; Word Bank, 2015). There is no denying that both large scale and small-scale mining are generally very destructive to the environment and the lives of local communities where mining operations take place. The above reason necessitated the choice of on

large-scale mining and its related issues, in order to bring to the fore issues related to large-scale mining by multinationals companies.

Mostly, large-scale mining takes place in the rural communities where the main source of livelihood is farming. When farmlands of host communities are taken over by mining companies, affected households are either compensated in cash or an alternative livelihood is provided for them. Due to lack of interest and skills in provided alternative livelihood activities, affected households may be compelled to develop alternative strategies to improve their economic and social lives. Moreover, even where cash is provided as compensation without an alternative livelihood provided, affected households are compelled to venture into other businesses to enhance their livelihoods. This research will be relevant because it seeks to explore the various coping strategies adopted by affected households. If the government of Ghana is going to draw policies to help reduce the impacts of mining on host communities, it is imperative to know the successful coping strategies of these communities to inform policies.

The research will add to the ongoing debate on the implications of mining on host communities by large-scale gold mining companies in Ghana and how this menace can be addressed. Also, this research will add to the ongoing debate on the need for the Government of Ghana to pay more attention to communities affected by large-scale mining and come out with possible solutions to halt its negative effects. This would enable better allocation of compensation to the people that are affected by the operations of large-scale mining activities.

1.6 Scope and Organization of the Study

The thesis is organised into eight chapters. Chapter One provides the general background of the study in the extractive sector and development context. Specific research questions and objectives

of the study are provided in this chapter. The chapter also justifies the study and also provide the structure of the entire thesis.

Chapter Two is devoted to the examination of the mining sector in Ghana. The chapter reviews the literature on the historical development of gold mining in Ghana and the major stakeholders involved in the process.

Chapter Three focuses on the review of the literature. The chapter reviews extant literature globally on the socioeconomic impact of gold mining activities. Also, the chapter looks at the conceptual framework of large-scale mining and the socioeconomic impacts of large-scale mining. Finally, the chapter reviews empirical studies on the socioeconomic impacts of large-scale mining and the theoretical review of the chapter.

Chapter Four delves into the methodological design for the study. The first part presents background information on the Upper Denkyira West District in the Central Region and the physical, demographic and occupational characteristics of the communities selected. The chapter also explains the sampling procedures and the sample size, and the data collection techniques utilised for the study. The method of data collection and analysis is captured in this chapter.

Chapter Five of this study focuses on the quantitative analysis and presentation of the impact of mining on the communities with a particular focus on the economic impacts of large-scale mining on the communities. There is also a focus on the demographic characteristics of the respondents in the study.

Chapter Six of the study focuses on the social impacts of large-scale mining on the three communities studied. The chapter presents result of both the qualitative and quantitative data collected. The qualitative data is thematically analysed and the quantitative is presented with descriptive statistics.

Chapter Seven of the study presents the health impacts of large-scale mining and the adaptation strategies that the people have developed to ensure that they cope with the impacts of large-scale mining in the community.

Finally, Chapter Eight summarises the thesis by presenting the conclusions on the study and gives specific policy recommendations to guide policy development in the mining sector in Ghana.

CHAPTER TWO

OVERVIEW OF MINING IN GHANA

2.1 Introduction

This chapter presents the overview of mining in Ghana. Various sections covered include, the pre-colonial traditional mining; the evolution of large-scale gold mining and its effects, and mining sector contribution to Ghana's economy. The chapter also discusses the legal and regulation framework on mining in Ghana, and issues of compensation.

2.2 Overview of Mining Activities in Ghana

Ghana is well endowed with substantial mineral resources, the major ones being gold, diamonds, manganese and bauxite. Gold is the predominant mineral produced in the country, accounting for over 90% of all mineral revenues annually over the past three decades. The country is also endowed with unexploited iron ore deposits, limestone, brown clays, kaolin, mica, columbite-tantalite, feldspar, silica sand, quartz, salt etc. There are minor deposits of ilmenite, magnetite and rutile. Some of these industrial minerals – e.g. brown clays, kaolin and silica sand- are being exploited on a small scale to supply local industries in ceramic, paint, and glass manufacturing. There is a huge potential in solar salt production, but this remains to be fully realised.

In 1983 Government launched the Economic Recovery Programme (ERP). Among its elements were:

(1) the adjustment of the cedi exchange rate to more realistic levels;

(2) the institution of a scheme by which exporters were allowed to retain a proportion of their foreign currency earnings for their operations and payment of dividends and

(3) the disposal of lossmaking state enterprises.

The export sector, particularly mining, was identified as one of the key sectors that could help revive the economy. In 1986 the Minerals and Mining Law (PNDC Law 153) was enacted to promote and regulate the orderly development of the sector. The Small-Scale Gold Mining Law (PNDC Law 218), the Mercury Law (PNDC Law 217) and the Precious Minerals Marketing Corporation Law (PNDC Law 219) were passed in 1989 to regularise and streamline small-scale gold mining, regulate the use of mercury by small-scale gold miners, and provide official marketing channels for gold produced by small-scale miners. These measures led to significant investment and activities in the mining sector and a substantial increase in the production of gold in the country, and some significant increases in manganese and bauxite production.

2.2.1 Pre-colonial and Post-Colonial Mining in Ghana

According to Botchway (1995), gold mining is considered the oldest and the most important industry in sub-Sahara-Africa. The mining industry is the main artefact of an ancient empire that existed in the sub-region, including Ghana, Mali and Songhai.

There is no proper documented record of the exact time gold mining began in Ghana. The scanty records available indicate that gold mining began several centuries before the arrival of the Portuguese in the fifteenth century, more precisely in 1471 (Mensah & Ababio, 2011). Dumett (1979) mentioned Gyaman, Adanse, Akyem Abuakwa, Denkyira, Wassa as the main towns that were endowed with gold. The most common traditional form of processing gold along streams, oceans and river banks was washing or panning compared to shallow-pitting. Workers of gold mine were family-based, primarily with women, young girls and boys doing the panning while men performed the digging. During that time, individual traditional leaders managed the mining

sector with their rules and regulations since no general mining sector policies existed (Mensah & Ababio, 2011). For example, in Wassa state, mining activities were to be carried out only on Tuesdays, Thursdays and Fridays (Dumett, 1987). Special days were also put aside during which the whole community worked together to produce gold for the kings in their respective states (Mensah - Ababio, 2011). During the pre-colonial period, mining in Ghana was entirely the work of indigenous Ghanaian people who supplied Europe with large quantities of gold (Mensah & Ababio, 2011). Junner (1935) reported that this continued until the early 1600s when Portuguese and other European traders became involved in alluvial mining along the Ankobra River, Komenda, west of Elmina, and east of the mouth of the Pra River. Their involvement in the industry was not extensive; hence, the industry was still the monopoly of local people with their rules and regulations (Griffis *et al*.2002).

2.2 Modern Scientific Mining

Griffis et al. (2002) explained that soon after the Gold Coast became a British colony in late 1874, a drastic change took place in the gold mining industry. This change was direct involvement in the exploration and development of deeper mines by groups of foreign promoters and engineers who introduced new mining technologies that were being developed in other gold mining districts all over the world (Griffis *et al.* 2002). For example, one persistent foreign prospecting and mining group led by a French businessman named Marie-Joseph Bonnat acquired a 40-year lease on a small mining concession near Tarkwa in 1878 on behalf of the Paris-based Compagnie Miniere de La Côte d or d'Afrique, generally known as African Gold Coast Company (Griffis *et al.* 2002). Apart from Bonnat, modern scientific mining in Ghana was opened by J. A. Skertchly, E. T. McCarthy, P. Dahse, C. J. Harvey and E. Wray. It was also during that period that the Ashanti Goldfields Corporation Ltd (AGC) started its operations. Despite this change, there was still no

direct involvement of the state to regulate the industry. Mining lease acquisition terms were directly negotiated with local chiefs to whom relatively modest amounts of money was paid, representing exploration and development, royalties and net profit interests (Dumett, 1987). During the period 1898 – 1901, the gold mining industry in Ghana experienced a boom in exploration with the massive involvement of Great Britain. They improved communication systems and developed laws and regulations to control the acquisition of mining concessions and operations in the mining sector. Granting of mining rights was no more the prerogative of local chiefs. More regulatory requirements regarding fiscal regime (royalties and other taxes), environmental issues and others were introduced, reducing the level of profitability for an investor (Akabzaa & Darimani, 2001).

Between 1902 and 1929, new colonial policies favoured investment in many sectors of the economy, especially the gold industry. As a result, many other mining districts such as Preastea, Bibiani, the Offin and Ankobra Rivers got involved in gold mining and contributed significantly to the production of gold which led to the official gold production in 1914 with about 410,500 ounces (ozs) (Iddrisu & Tsikata, 1998). Despite this significant improvement, Griffis *et al*. (2002) noted that one critical issue faced by the country concerning the industry was the shortage of local labour force. Most indigenous people were attracted more to other sectors such as the construction industry and cocoa farming, and those interested in mining preferred to work with the traditional mines. Consequently, workers were being imported from the Northern Territories, the neighbouring French colonies and Nigeria (Akabzaa & Darimani 2001; Griffis *et al.* 2002).

The Great Britain got more involved in the mining industry with the introduction of modern scientific techniques, which enabled discoveries of more mineral deposits followed by the arrival of more foreign companies. The mining industry in the Gold Coast at that time could be divided into small-scale traditional mining and large-scale more scientific mining. Nevertheless, as noted,

the latter was suffering from local labour shortage because most of the local people, among other reasons, preferred working in their own mines (Akabzaa & Darimani 2001; Griffis *et al*. 2002).

The country has a long tradition of gold mining, with an estimated 2,488 metric tons (80 million ounces) of gold produced between the first documentation of gold mining in 1493 and 1997 (Kesse, 1985; Ghana Chamber of Mines, 1998). The country also accounted for 36% of total world gold output (8,153,426 ounces) between 1493 and 1600 (Tsikata, 1997). It is the second-largest gold producer in Africa after South Africa, the third-largest African producer of aluminum metal and manganese ore and a significant producer of bauxite and diamond (Coakley, 1999). Despite the economic potential of the mining industry in Ghana, mining output had decreased significantly since the late 1950s with gold experiencing the most dramatic decline in production. As Aryee (2001) puts it, "For four decades up to the 1980s no new mine was opened in Ghana due to a myriad of problems faced by mining sector investors and potential investors alike, as a result of the economic, financial, institutional and legal framework within which the mining sector operated" (2001:62).

2.3. Comparison between Small Scale Mining and Large-Scale Mining

Currently, the two main players in Ghana's mining industry are Large Scale Mining (LSM) and Artisanal and Small-Scale Mining (ASM) (Minerals Commission, 2014). It is important to differentiate between these two industries, as they differ greatly in organisation, technology and labour employed. ASM is often used interchangeably with *galamsey* in Ghana. The difference between the two is that: ASM is formally registered and is backed by the mineral and mining Act, 2006, Act 703 and is licensed by the Ministry of Lands and Natural Resources (MLNR) for a term of five years renewable. The ASM operations normally do not involve huge capital investment and are characterised by a few employees and operate on land not more than 10 hectares. ASM mining

is done through the use of simple tools and equipment. ASM miners usually employ basic technology to extract gold (Harkinson, 2003; Owusu-Nimo *et al*., 2018). In contrast, *galamsey*, with its operators called *galamseyors* (meaning gather and sell) is the process whereby mining operation is undertaken without proper concessions and acquisition of permits from the state regulatory institutions: Environmental Protection Agency (EPA), Minerals Commission (MC), Forestry Commission (FC) or even the district assembly. Due to their non-regularised status, it is difficult for them to pay tax and statutory fees. *Galamseyors* operate at sensitive or prohibited areas (such as forest reserves, water bodies, sacred and culturally significant areas (Owusu-Nimo *et al*., 2018).

Ghana's small-scale mining operations over the last ten years have increased tremendously. Their activities have been associated with health hazards, environmental damages, social costs, poverty, tax evasion and political tension (National Geographic, 2017; Times, 2017). Such negative impacts have been attributed to the poor regulation of the ASM sector; hence it is difficult to monitor their operations (Minerals Commission, 2014). In Ghana, the ASM group has two dimensions: those who have registered legally and have been given licenses to mine and those who have not registered but yet engage in small scale mining activities (*galamsey* activities). Ironically, Ghanaians are not the only ones engaged in illegal mining, but also some foreign nationals are involved in the practice of galamsey.

More so, the majority of ASM miners in Ghana operate without a license, and empirical data is extremely scarce (Cust & Poelhekke, 2015; World Bank, 2015). ASM is mainly reserved for Ghanaians, and this is to give indigenes of communities with gold to enter into the mining sector so that a more significant portion of foreign exchange will be retained in the country (Mantey *et al.* 2016). ASM plays a very significant role in the socioeconomic development of the country. It contributes significantly towards foreign exchange earnings and generates direct and indirect

employment for the people of Ghana. In 2016, ASM gold miners exported 1,134,660 ounces valued at $ 1,361.59 million (Ghana Extractive Industries Transparency Initiative (GHEITI), 2016).

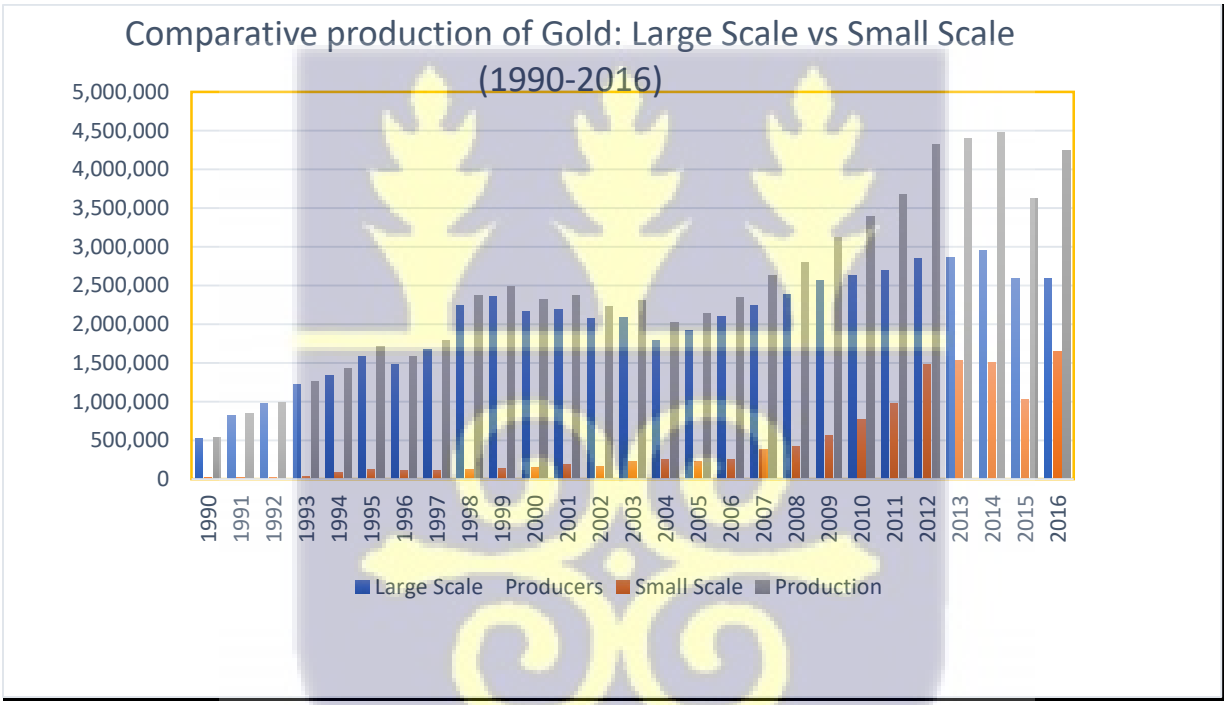
Ironically, public perception on the effects of mining is primarily driven by reports on environmental damages, such as mercury contamination of soil and water, deforestation, as well as health hazards and numerous social problems such as prostitution, drug abuse, corruption and violence (Hirons, 2011; Knutsen et al. 2017; Mantey *et al.* 2018; Rahm *et al.* 2014; Schueler *et al.* 2011; Van Straaten, 2000). The ASM operations are also often blamed for causing extreme poverty in the communities within which they operate (Hilson & McQuilken, 2014; Mantey *et al.*, 2018).

Multi-national mining companies with modern technology dominates large-scale mining. Research conducted by (GHEITI 2016), shows that the Government of Ghana owns 10 percent equity interest in mining operations within the country LSM is highly mechanised and is capital-intensive (Aryeetey *et al.*, 2007). The LSM companies also have pretty huge employee base compared to the ASM group (GHEITI, 2016). As at 2014, approximately 12,300 workers out of 11 million people in Ghana were employed in the large-scale mining sector (US Geological Service, 2014). The number of large-scale mining companies in Ghana are more than 23; producing gold, diamond, bauxite and manganese. Some of these companies are Adamus Resources Limited, AngloGold Ashanti Limited, Perseus Mining Limited, Golden Star Resources, Newmont Ghana Limited, to mention a few. The government of Ghana have a stake in some of the above-mentioned companies (GHEITI, 2016). Most mining companies in Africa, mainly from Canada, South Africa, and Australia, have operations in Ghana (Baffour-Kyei, Mensah, & Owusu, 2018). These multi-national mining companies render various cooperative social services to affected communities such as modern roads, health and educational facilities, scholarship schemes

for affected communities and provision of alternative livelihoods for affected farmers (GHEITI, 2016). Nevertheless, LSM activities have also been linked to some negative impacts such as decreased agricultural productivity, joblessness, conflicts, increased local corruption, health and environmental effects (Aragon & Rud, 2016; Berman *et al.*, 2017; Knutsen *et al.*, 2017).

Figure 2.1 shows the comparison between large scale and small-scale mining in the production of Gold. The data was extracted from the Mineral Commission database for the production of Gold between 1996 to 2016. It is evident that gold production by the large-scale mining supersedes that of the small-scale mining in Ghana across the various years.

Figure 2.1: Comparative between Large Scale and Small-Scale Mining



Source: Mineral Commission (2016)

In Ghana, artisanal gold mining started before the emergence of large-scale gold mining (Hilson, 2020). The most famous forms of artisanal mining were; washing and panning along the banks of rivers and streams, deep-shaft mining and shallow pit surface mining. The type of workforce needed for the mentioned forms of artisanal mining was mainly families and slaves. During the

time of artisanal mining, mining was a way of support to craftwork and farming and was normally carried out on small portion of lands with the use of simple tools that did not involve huge capital (Ofosu-Mensah, 2011). In the 19th century, modern mining began and that led to a decline of ASM in Ghana. ASM approaches to gold mining was later improved to a more complex and mechanized technique (COWI, 2016). These new techniques are the use of excavators, crushing machines and equipment for dredging rivers, which can be attributed to the emergence of LSM (Crawford & Botchwey 2016; Yankson & Gough, 2019). Large-scale mining companies increasingly come across ASMs workers during their line of activities, and this sometimes leads to tension and conflicts between the two since they both compete for the same resources. According to Priester (2007), the views on LSM and ASMS below contributes to the conflict between LSMs and ASMs:

The LSMs are of the view that they have the legal mining title, therefore, the right over the mining concessions. They also think they contribute much more to the growth of the economy compared to ASMs through the payment of royalties. The LSMs also seem to have the backing of the security forces and are able to engage them to forcibly remove ASMs from their mining concessions when it is encroached. ASMs are also however of the view that, with or without mining license, they have the traditional rights to access any mineral on their lands. The ASMs sometimes also believe they have the support of local administration or traditional authorities. Some of the challenges ASMs face include lack of land to operate as a result of grants concessions to large-scale mining (Sinding, 2005), marginalization of ASM in terms of access to mineralized land (ISSER, 2017), and periodization of the LSM over ASM (Mcquilken & Hilson, 2016).

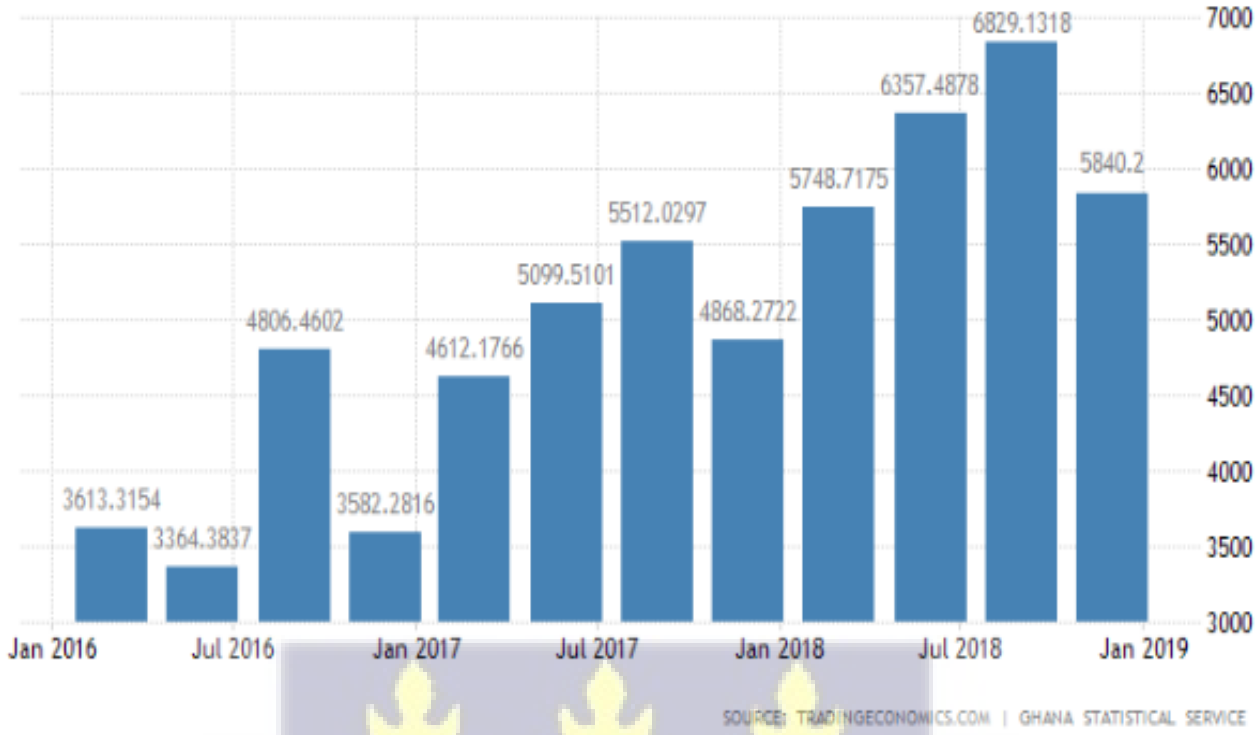
2.4 Mining Sector contribution to Ghana's Economy

Natural resources, especially mineral resources are fundamental to development. They are a gift of nature available to be developed, sold and used to better the lot of a nation's citizens (Eggert, 2002). Mineral production in Ghana generates income for the country through exports, tax

revenues and royalties paid by mining companies. Revenues gotten from the mining sector are spent on education, roads, health care and other developmental projects. The mining sector also generates employments avenues for some Ghanaian citizens, thereby stimulating their local economies (Baffour-Kyei, Mensah, & Owusu, 2018). The Mining industry of Ghana accounts for 5% of the country's GDP and minerals make up 37% of total exports, of which gold contributes over 90% of the total mineral exports. Thus, the main focus of Ghana's mining and minerals development industry remains gold (Berman *et al*., 2017).

According to Ghana Chamber of Mines (2017), the contribution of the mining and quarry sub-sector to GDP in Ghana increased to 8.01 million USD (GHS 36.06 million) in 2017 from 5.46 million USD (GHS 24.58 million) in 2016. The report indicates that GDP from mining in Ghana increased to 9.68 million USD (GHS 43.57 million) in the second quarter of 2018 from 12.77 million USD (GHS 57.48 million) in the first quarter of 2018. Its contribution to direct domestic revenue improved from 36.67 million USD (1.65 GHS billion) in 2016 to 48 million USD (GHS 2.16 billion) in 2017, representing a growth rate of 31 percent. In 2017, the largest source of direct domestic revenue mobilized by the Ghana Revenue Authority (GRA) was from the mining sector (Ghana Chamber of Mines, 2017).

Figure 2.2: Mineral export trading in Ghana (2016-2019)



2.5 The Performance of Ghana's Mining Industry and its Economic Implications

Ghana earns a substantial proportion of foreign exchange from gold exports, contributing greatly to GDP (Appiah & Buaben, 2012). Evidence of this is reflected in the number of mining companies in Ghana, with the majority of these companies located in the Western Region of Ghana. They include Prestea Sankofa Gold Limited, Goldfields Ghana Limited, Bogoso Gold Limited, (Golden Star Resources), AngloGold Ashanti (Iduapriem), Abosso Goldfields Limited, New Century Mines, Chirano (owned by Red Back Mining until Red Back was bought by Kinross Gold in 2010), and Newmont Ghana Gold Limited.

Ghana's economic index of gold export performance upsurge to 4.61million ounces in 2017 from a downward trend of 3.84 million ounces in 2016 (Bank of Ghana, 2018). This 20% surge was due to an increase in large scale mining productivity and the relatively good market price of exported minerals. Again, manganese witnessed an upsurge of 3 million tonnes in 2017 from 2 million

tonnes in the previous year. Bauxite also increased to 1.47 million tonnes from 1.14 million tonnes within the same period (Minerals Commission, 2018). The analysis of this economic performance of the mineral wealth mined from various communities in Ghana has seen an increment of 50% shipment rate for manganese and 29% for bauxite (Minerals Commission, 2018). The macroeconomic inputs of mining in 2017 revealed some significant inroads achievement from the fiscal revenue outlook perspective as the topmost direct domestic revenue inflow (Ghana Revenue Authority (GRA]), (2018).

Table 2.1: Fiscal Revenue Performance of the Mining and Quarrying Sector

Type of Fiscal Revenue (GH₵)	2016	2017	% Change
Corporate Income	696,978,327	969,567,314	39%
Royalty	550,738,649	702,407,280	28%
PAYE	399,925,811	487,988,013	22%
Others (Self-Employed)	540,259.67	780,164	44%
Total	1,648,183,048	2,160,742,773	31%

Source: Ghana Revenue Authority (2018)

Table 2.1 presents a record of GH₵ 969,567,314 registered inflows from corporate income tax (thus 39% rise) in 2017 from GH₵ 696,978,327 million base in 2016, notwithstanding earning from royalties and income tax that have seen 28% rise from GH₵ 550.7 million to GH₵ 702.4 million, and 22% rise from GH₵ 399.9 million to GH₵ 487.9 million respectively (GRA, 2018). In terms of proceeds from export revenues and balance of payments there is about 19% increase in mineral value of US$ 6,004 million in 2017 from US$ 5,060 million in 2016, hence the leading source of foreign exchange among all export commodities (Bank of Ghana, 2018).

In Ghana, the recap of the 2017 economic index of mining firms which are producing members of the chamber of mines recorded 70% revenue of which, US$ 2.57 billion was ploughed back into the country through commercial and central banks. Again, in nominal terms, most mining firms' expenditure from 2016 to 2017 saw US$ 215.6 million increments, as a result of sourcing of local inputs at the expense of foreign materials. This has impacted the economy of Ghana positively both at the national and local levels, due to the increase in the procurement and use of local materials in their production process. The statutory outflows in 2017 from the mining sector added up to US$ 400.4 million, with staff compensation being US$515.1 million, and with shareholders also receiving 1% US$ 36.8 million in of the mineral revenue (Bank of Ghana, 2018). In 2017, the mining firms' expenditure on investment increased to US$ 19.8 from US$ 12.2 million in 2016 as a result of many social initiatives in the various local mining communities (Bank of Ghana, 2018). Furthermore, the nation has benefited from jobs in the sector that sum up to 11,628 in 2016 but witnessed a downward trend to 10,503 in 2017 due to the restricted employment as a result of the contract-based exploration system adopted rather than owner-based system previously applied. Although mining companies relatively downscaled their labour force to commensurate with their functional requirements, the significant multiplier effects on local folks are still enormous (Bank of Ghana, 2018).

2.6 Legal and Regulatory framework on Mining in Ghana

The Ministry of Lands and Natural Resources in Ghana (MLNR) oversees all aspects of Ghana's mineral sector and is responsible for granting mining and exploration licenses. The Mining and Minerals Act, 2006, Act 703 mandate is to ensure the sustainable management and utilisation of the nation's lands, forests and wildlife resources and the efficient management of the mineral resources for socioeconomic growth and development. The MLNR is the supervising Ministry for

the Office of the Administrator of Stool Lands (OASL) and the Minerals Commission (MC). It also has a supervisory role over the Minerals Development Fund (MDF).

The MC is an agency under the MLNR, which is responsible for administering the Mining Act (2015) as well as making recommendations to the government of Ghana on mineral policy, promoting mineral development, advising the government on mineral matters, and as a liaison between the government and mining industries. (Anon, 2016; Amponsah-Tawiah & Dartey-Baah, 2011). The Commission receives payments for grants of mineral rights (i.e. reconnaissance, prospecting and mining rights, and other permits) from mining entities. These receipts are applied as internally generated funds.

The Ghana Geological Survey Authority (GSA) Act, 2016 (Act 928) was passed by Parliament to convert the Ghana Geological Survey Department (GSD) into an Authority to enhance its capacity for new mineral discoveries throughout the country and diversifying the country's mineral resource base. The GSA also conducts geological studies to identify places with gold (Anon, 2016; Amponsah-Tawiah & Dartey-Baah, 2011).

The Precious Minerals Marketing Corporation (PMMC) is a government entity tasked to promote the development of small-scale gold and diamond in Ghana, and also to purchase the output of small-scale mining groups. It acts as a buyer of diamond and gold mined by small scale mining groups either directly or through licensed buyers. They are required to register with the Minerals Commission for licenses to operate. However, due to the many frustrations the public faces in the registration process, many of the miners opt to operate illegally (Aubynn, 2009). The Inspectorate Division of Minerals Commission (IDMC) is in charge of monitoring and enforcing health, safety, and environmental standards in mines as established by the mining and mineral laws (Anon, 2016; Amponsah-Tawiah & Dartey-Baah, 2011).

Parliament of Ghana passed the Minerals and Mining (Amendment) Law, 2014 in 2015 to amend the Minerals and Mining Act, 2006 (Act 703). The amendments are two-fold, first to address the rate for royalty payments and the second is to provide for the confiscation of equipment used in illegal small-scale mining. The new law also criminalizes illegal small-scale mining, popularly known as galamsey. It also clarifies the illegality of small-scale mining by foreigners and Ghanaians without a permit which was not spelled out in the old law (Anon, 2016).

The main laws and regulations governing the mining sector are captured in Table 2.2

Table 2.2: Laws and regulations in the Mining Sector of Ghana

(a) The Constitution of the Republic of Ghana, 1992
(b) The Minerals Commission Act, 1993 (Act 450)
(c) The Environmental Protection Agency Act, 1994 (Act 490);
(d) The Environmental Assessment Regulations, 1999 (L.I. 1652).
(e) Minerals and Mining Act, 2006 (Act 703) as amended by the Minerals and Mining (Amendment) Act, 2010 (Act 794) and subsequently Act 900 of 2015.
(f) Minerals and Mining (General) Regulations, 2012 (L.I 2173);
(g) Minerals and Mining (Support Services) Regulations, 2012 (L.I 2174);
(h) Minerals and Mining (Compensation and Settlement) Regulations, 2012 (L.I 2175);
(i) Minerals and Mining (Licensing) Regulations, 2012 (L.I 2176);
(j) Minerals and Mining (Explosives) Regulations, 2012 (L.I 2177);
(k) Minerals and Mining (Health, Safety and Technical) Regulations, 2012 (L.I 2182)
(l) The Income Tax Act, 2015, (Act 896)
(m) Minerals Development Fund Act, 2016 (Act 912)

Source: Minerals Commission, 2016

The following specifications were included in the Minerals and Mining Act 2006, Act 703 as amended by the Minerals and Mining (Amendment) Act, 2015 (Act 900):

(i) Expenditure on exploration and development may be capitalised per regulated amortisation provision for tax relief;

(ii) capital allowances have been designed to shorten the pay-back period and include 75 percent write off of capital in the first year and 50 percent annually after that on a declining balance;

(iii) Retention of a proportion of revenue in a foreign currency account for use in acquiring essential equipment and spare parts required for mining operations which would otherwise not be readily available without the use of such earnings;

(iv) Exemptions from import duties on imported plants and equipment. The Ghana government previously maintained a 10 percent interest in all mineral rights, with the option to acquire a further 20 percent (or 45 percent in the case of salt). This has now been limited to only 10 percent. Any further participation is to be on terms agreed with the holder.

By law, mineral deposits in lands (and elsewhere) are vested in the President on behalf of and in trust for the people of Ghana (Tsikata, 1997; Hilson 2001; Hilson 2001, Ghana Chamber of Mines, 2015).

Currently, the mining industry boasts of about 23 large scale companies producing gold, diamond, bauxite, and Manganese, with over 300 registered small-scale mining groups and 23 gold mining companies and 90 support services companies (Minerals Commission, 2018). Traditional institutions and district assemblies are in charge at the local level in acquiring lands in their domain for mining activities as part of the government structure (Ayee *et al*., 2011; Minerals Commission, 2014). Although about 80 percent of all lands in Ghana (on which minerals are likely to be discovered) is customarily controlled by the traditional Stools and Skins who hold such lands in

trust of their respected communities, however, procuring a mineral right by law is to be granted by agents of the State and not the landowner (Aubynn, 2009).

The compensation principles set out in the in Ghana's Minerals and Mining Act, 2006 (Act 703) states that any individual that owns the land, be it bare land, farm, or an occupant have the right to demand a holder of mineral right for compensation for the use of their land by a mining company. However, compensation in any form is subject to the approval of the Land Valuation Board (LVB) through deliberations between parties concerned. When there is a disagreement, the MLNR mediates between concerned parties and the land valuation board. A landowner may apply to the High Court to determine compensation where the parties disagree on the terms of the package proposed by the MLNR. An alternative settlement has been included as compensation to landowners (Ayee *et al*., 2011).

2.6.1 Amendment to Act 703

The Minerals and Mining (Amendment) Act, 2019 (ACT 995) introduced an amendment to the Minerals and Mining Act, 2006 (ACT 703). The amendment seeks to deter foreigners from undertaking small-scale mining and also to impose firm punishment to people who sell or purchase minerals without a license. However, further amendments are being proposed to Act 703 which seek to introduce consideration on gender when it comes to employment in the mining sector. The proposed amendment to Act 703 also seeks to reduce government duration on development agreement from 15 to 5 years (Minerals Commission, 2019).

2.6.2 Monetization of Mineral Royalties

Under the Mineral Income Investment fund (MIIF) ACT, 2018 (ACT 978), the MIIF ("the Fund") is established with an expressed objective of, among other things, monetising the value of

Government revenue from mining. The fund is from income generated from the country's equity interest in mining companies, mineral royalties and other related income from mining operations. The provision of ACT 978 empowers the fund to create and hold equality interests in a Special Purpose Vehicle (SPV) in any jurisdiction, procure the listing of the SPV to a reputable stock exchange, assign or transfer rights to its sources of income and to grant security over its asset. The government is reported to be engaged in negotiation with an entity called AGYAPA (Minerals Commission, 2019).

2.7 Conclusion

Mineral operation in Ghana plays an essential role in the development of the country's economy through income gain from tax revenues, foreign exchange and royalties. There two main types of mining in Ghana namely; large-scale mining and the artisanal and small-scale mining. The Ministry of Lands and Natural Resources oversees the activities of the two types of mining in Ghana and the mining sector in Ghana since the mid-1980s has seen several legal reforms and amendments to the laws and regulations governing the sector.

CHAPTER THREE

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

3.1 Introduction

This chapter presents a review of existing literature related to large-scale gold mining and its socioeconomic implications on local communities in Ghana. The chapter reviews empirical related literature on the socio-economic effects of mining. The chapter concludes with a discussion on the theoretical framework and the conceptual framework adopted for the study.

3.2 Empirical Literature

3.2.1 Socioeconomic framework

Many authors have posited that socioeconomic impact has several connotations for development practitioners and researchers (Amponsah-Tawiah & Dartey-Baah, 2011; Adjei, 2007; Aragón & Rud, 2013; Ioannou & Serafeim, 2015). In general, the phrase 'socioeconomic impact' epitomises both the negative and positive characteristics brought about by mining activities on the economic and social welfare of host communities (Morris & Baartjes, 2010). This study defines socioeconomic impact as the potential of proposed development activity to negatively or positively change the lives of current and future residents of a community. According to Sach *et al*. (2001), the socioeconomic impact is anything that positively or negatively affects the development, individuals or communities. The term socioeconomic can be well understood in the context of development. In this case, development is generally defined as improving a range of dimensions such as education and health (Kariuki, 2009).

According to Todaro and Smith (2014), development is defined as the process of improving the quality of all human lives and capabilities by raising people's levels of living, self-esteem and freedom. This understanding encapsulates the totality of socioeconomic development expected

from a development activity such as mining. It adds to Sen's (1999) understanding of development as a process of improving people's fundamental freedoms so that they can enjoy life and make the most of it. This implies that any development that disempowers communities is a negative influence and should be reviewed. Roland (2014) contended that an empowering development initiative involves a long-term process where some interdependent microeconomic capabilities are combined with incentives to support and improve a community's well-being.

3.2.2 Natural Resource Abundance and Economic Development

There is a vast literature on the role of mineral resources and their impact on economic development. Nevertheless, the symbiotic connection between mining and economic development has, over the years, witnessed many controversial debates. This is due to several documented adverse repercussions on the ecosystem, and most importantly, many adverse socioeconomic and health implications on human lives (Addison, Ghoshray, & Stamatogiannis, 2016; Balany & Halog 2016; Evans, 2015; George, 2013; Sinyangwe, 2012). Several kinds of research have identified the significant contribution of mining to poverty reduction and overall economic growth (Antwi, 2010; Breckenridge, 2012; Dillon & Barrett, 2015; Salifu, Oladejo, & Adetunde, 2013). On the contrary, other researchers have argued that dependence on natural resources could lead to environmental degradation, slow economic growth, and social upheaval (Addison, Boly, & Mveyange, 2017; Brunnschweiler, 2008; Evans, 2015).

In the early 1990s, the motivation associated with much research on mining attained an increased level to justify the over two decades of a retrogressive economic index of countries with mineral wealth (Auty, 2001; Sachs & Warner, 1995). It was expected that monetary resources and wealth gained from mining and other natural resources would eventually deliver and trigger the socioeconomic development needs of many developing nations. The realities, nevertheless, is that

most developing and or Third World nations are in sharp contrast to this expectation (Addison, Ghoshray, & Stamatogiannis, 2016; Evans, 2015). Conversely, other scholars have established the contribution of mining to development and economic growth. For example, mining has impacted the economy of most industrialised nations like the United States of America, Sweden, and Canada. Mining has contributed to the above-mentioned countries due to the efficient utilisation of their natural resources (Breckenridge, 2012; Dillon & Barrett, 2015).

According to Aspinall (2007) and Ross (2008), the many divergent and opposing views on mining and its impact on society, particularly development have produced terminologies such as the "resource curse", the "Dutch disease", and "greed and grievance" (Hilson & Maconachie 2009; Oyejide & Adewuyi, 2011). Undeniably, these terminologies have been strongly challenged due to the likelihood of political reverberation these terminologies carry and communicate. However, many also maintain the proposition that the empirical evidence for the curse is principally a relic of indicator choice (Aspinall, 2007; Brunnschweiler & Bulte, 2008). In the light of this, mining scholars have reframed the debate terminology from "curse" to "resource endowment" (International Council of Mines and Metals [ICMM], 2006). However, in the face of these prolonged debates, some level of agreement has surfaced among critics and supporters of mining. For example, Auty (2001) provided evidence that foresaw the scope of mining to avoid the curse, whereas Pegg (2006) contended that mining could provide an enormous avenue for resource wealth and substantially translate the economic fortunes of many impoverished developing nations Many questions have been posed to ascertain if, indeed, natural resources can support socioeconomic development.

3.2.3 Effect of Large-Scale Mining

3.2.3.1 Socioeconomic effects of Large-scale Gold Mining at the Local Level

Over the past decades, researchers have examined the contribution of natural resource extraction to the socioeconomic wellbeing of people living in and around mining sites (Antwi, 2010; Chuhan-Pole, Dabalen, & Land, 2017; Kapstein, & Kim, 2011). Unfair exchanges in trade was initially brought to attention by Frank (1996) through an inquiry of "underdevelopment" in Latin America in the1960s.These were prevalent, where exportation of raw materials from mining regions were at relatively low prices. In contrast, the importation of value-added products was at a higher value. As a response to the boom extraction of minerals in the 1980s, Godoy (1985) recommended a systematic study into mining and its social and cultural dimensions. Ballard & Banks (2003) assert that through Godoy's evaluation of industry-related research, a framework was provided which has brought a transformation in the scope of research in mining, with greater attention on mining communities, especially from the indigenous people from developing countries.

According to Holden (2007), large-scale gold mining benefits to many nations are realised when proceeds are well utilised and become a catalyst for stimulating economic growth, driving social impact projects and reducing poverty. Subsequent research works have stressed the socioeconomic implications of mineral extraction on a host and neighbouring communities, most especially within the context of remote areas and ethnic minorities (Chuhan-Pole, Dabalen, & Land, 2017). Aragon and Rud (2012) argue that mining firms impoverish local communities where they operate. Thus, despite the huge taxes and royalties from mining firms in Africa, the poverty level in mining communities increases as most of the revenues go to the central government. Just about 9% of royalties being given to the traditional authorities stimulate community development. However, according to Solomon (2011), mining has stimulated welfare improvements. These are; job creation, increase in financial wellbeing and poverty reduction in many countries of the world. Also, mining operations facilitate the growth of small and medium scale businesses by delivering

core and ancillary supply services to mining firms, hence stimulating a significant increase in income (Antwi, 2010).

Furthermore, the literature indicates that substantial income derived through direct jobs at mining companies economically empower millions of workers globally (Banks, Kuir-Ayius, Kombako, & Sagir, 2013; Breckenridge, 2012; Dillon & Barrett, 2015). Moreover, big gold mining firms are anticipated to generate jobs for neighbouring communities via direct avenues such as the construction of infrastructure; indirect jobs created through the use of local inputs, and its associated local economy multiplier effects between dealers, merchants, and contractors (Salifu, Oladejo, & Adetunde, 2013). Again, there is the delivery of capacity training, provision of social amenities like good drinking water, the building of schools, roads, hospitals, and overall infrastructural development (Antwi, 2010; Obeng- Odoom, 2014).

The research works by Solomon (2011), Antwi (2010) and Obeng- Odoom (2014) are seen to have focused on the positive aspects of the effects of mining in the communities. An argument could be made for mining to increase the unemployment rate in mining communities since most of the mineral concessions given are in the rural areas where the inhabitants are farmers. The net effect of mining in the local communities, despite creating job opportunities, causes unemployment and poverty. In conclusion, it could be inferred that the studies by Solomon (2011), Antwi, (2010) and Obeng- Odoom, (2014) is bias and as such making argument for large scale mining.

Despite the constructive socioeconomic gains associated with large-scale gold mining, several studies have also established linkages of gold mining communities with high incidence of poverty and unemployment (Evans, 2015; Sinyangwe, 2012), tensions between the local people and mining companies (Bebbington, Hinojosa, Bebbington, Burneo, & Warnaars, 2008), as well as an increased in crime (Garvin, McGee, Smoyer-Tomic, & Aubynn, 2009). Owen and Kemp (2014) believe that the uncertainty of substantial revenue derived from mining operations could lead to

reluctance on the part of investors and governments to inject capital into mining communities, further limiting economic development.

It has also been argued that, extraction of mineral resources such as gold has been cited as the major cause of environmental degradation, especially regarding contamination of water bodies and deforestation (Amponsah-Tawiah & Dartey-Baah, 2011; Balanay & Halog, 2016). Amponsah-Tawiah and Dartey-Baah (2011) and Evans (2015) focused on the impacts of mining in local communities as cases in Ghana have indicated mining communities in the country are one of the most deprived communities. This is because mining communities record increase in unemployment and lack of development. Again, the environmental degradation component of large-scale mining is seen as the reality and a better reflection of the activities of large-scale mining.

Indeed, the huge salaries paid to mine staff lead to price inflation on essential goods and services such as rent, food, transport, and so many others to the detriment of the ordinary people (Owen & Kemp, 2014). Furthermore, gold mining whether small or large-scale, often distort the functional and daily livelihood activities of host and neighbouring communities, through the pollution of lands and water resources. (Amponsah-Tawiah & Dartey-Baah, 2011; Kapstein & Kim, 2011). Khan (2010) and Tonts, Plummer & Lawrie (2012) also assert that the global volatility of commodity prices causes inherent vulnerability of communities who are dependent on these resources for their livelihood. Volatility has been associated with fluctuations regarding mining production, employment, etc., thus contributing to instability of the economy.

The increasing level of poverty in mining communities is seen to be general across all geographical regions in the world as findings by Deaton & Niman (2012); Duncan & Coles (2014) indicates that even developed countries in several studies recorded increasing levels of poverty, for instance,

poverty has been very pervasive in Blackwell, a community located in the Appalachian region in the United States, even when coal mining peaked. Several years after the boom, residents of Blackwell have been left with widespread inequality, high unemployment rates, in addition to mine-related illnesses (Duncan & Coles, 2014).

3.2.3.2 Effects of mining on agriculture and food security

Many governments in Africa have sought to improve the mining sector of their countries by implementing reforms and programmes (Hilson & Banchirihag, 2009). Relevant government agencies have also been revamped as well as amended legislation in the mining sector to attract foreign investors (Bridge, 2004). There has been a tremendous increase in the influx of foreign investors in the production of minerals throughout sub-Saharan Africa, Asia and Latin America (Hilson & Banchirihag, 2009). During the Economic Recovery Programme (ERP) in Ghana, there were several reforms to the mining laws, regulations and policies to strengthen the mining sector. The ERP also support institution, de-emphasising state control in the mining industry, formulate environmental guidelines in the sector and recapitalized funding for mines to enhance the sector's fiscal regime (Hilson, 2002). However, there still exist challenges in the mining sector such as the environmental, social and health effects of mining on host communities. Investments in mining are expected to restrict mining communities' access to food in many regions worldwide. An NGO report indicates that in Limpopo, South Africa, mining communities' lost access to farming due to platinum mine (ActionAid, 2016).

Land loss due to mining has led to less food produced by farmers in mining communities. This leads to insufficient provision of farm produce to the markets and food has to be imported in larger quantities possibly at a price that may be unreasonable for poorer households (Business Day, 2012). Food security can be viewed at three levels; household, nation and global levels. The

availability of food to all members of a household for an active and healthy life is considered at the household level. At the national level, according to Work Food Summit (1996) is a circumstance whereby all people in a nation have access to sufficient food at all times to maintain an active and healthy life (WHO, 2013). Global level food security is defined as a situation where at all times people have sufficient safe and nutritious food which meets their dietary needs (FAO, 2013). According to the International Federation of Red Cross and Red Crescent Societies (IFRCRCS) (2006), food security is based on four pillars namely: food availability, access to the available food, food utilisation and food stability (Wikipedia, 2014).

Rud (2012) stated that most mining sites in Ghana are located in areas where agriculture is a major livelihood for the indigenes. He concluded that pollution of both air and water affects the produce of farmers by decreasing the productivity of farmers who lived close to mines compared to farmers who live further away. Research by Action Aid at Obuasi reported food crops of farmers were poisoned by the mines from pollution (Action Aid report, 2006). Again Ocansey (2013), indicated that foods becomes scarce in mining communities due to pollution of soil by chemicals substances released during the process of mining which reduces food productivity. He also concluded that the workforce in farming communities reduced as youths abandon farming to mining which also contributes to food insecurity in mining communities (Ocansey, 2013). This confirms a statement made by Aragon and Rud (2013) that mining grape lands for farming leads to a high cost of living in mining communities and further leads to a high price of agricultural produce.

The authors of this report concluded that households in Limpopo experienced livelihoods crises as they experienced food insecurity. Similar studies have also established negative effects of extractive industries on food security example coal mining in Bangladesh (Bedi, 2015), copper mining in Zambia's Mazabuka & Solwezi districts (The Zambia Analyst, 2013) and metal mining in Palawan, Phillipines (Philippines Daily Inquirer, 2011).

3.2.3.3 Environmental effects of Mining

The adverse environmental effects caused by mining present potential threats to the economic development and the health of populations at the local, regional and national levels. Globally, there exist substantial evidence of environmental effects caused by mineral extraction, whether on a small or large scale (Evans, 2015; George, 2013; Patra, Gautam, Majumdar & Kumar, 2016; Tripathi, Singh, & Nathanail, 2014; Upadhyay, Verma, Pratap Singh, Devi, Vishwakarma, Kumar & Rani, 2016). For instance, Tripathi, Singh, and Nathanail (2014) posit that mining usually results in irreparable consequences, leading to lasting environmental effects at the closure of mining activities. The non-renewable nature of the resource makes the impacts on the environment a more devastating one.

The degree of environmental distortions and ecosystem destructions caused by mining in the country have been well established by several researchers in the literature (Armah, Obiri, Yawson, Afrifa, Yengoh & Olsson, 2011; Armah, Luginaah, Taabazuing & Odoi, 2013; Mensah, 2015). According to Armah *et al*. (2011), the scale of destructions and degradations encountered principally result from the methodology deployed during the process of extraction. Other researchers have also attributed the continuous environmental distortion and ecosystem destruction witnessed by mining in Ghana on factors such as; insufficient research on the consequences and effects of mining in the communities and low entry restrictions. Also, ineffective coordination and enforcement regimes, adverse use of mercury, inadequate local community engagement, bureaucratic and prolonged mining registering processes, insufficient resources challenges, absence of environmental sensitization and awareness campaigns, among several others (Aubynn, 2017; Aubynn, Amoako-Tuffuor, & Kutando, 2015; Okoh & Hilson 2011).

Okonta and Douglas (2003), researching into the activities of Shell Oil Company exploration in the Niger Delta enclave in Nigeria concludes that, non-compliance of the environmental regulations by Shell left some oil pipes naked and rusted. As such this was the cause of the frequent spillages and fire outbreaks in the country. In addition, there were contaminations of rivers and lakes as well as damage to aquatic life. No compensation was provided for affected communities, and in few cases where compensation was provided, the court had to force Shell to compensate the affected areas, which in some instances was paid 25 years later after the court verdict.

Yeboah (2008), in his study found that mining activities have contributed to land degradation, resulting in limited land for local food production as well as other agricultural purposes within the Obuasi Municipality. The study also found that water pollution resulting from mining activities has adversely affected major streams within areas such as Kwabrafo, Nyam, Pompo, San and Akapori. Additionally, the study discovered evidence of air and noise pollution in the areas.

Furthermore, Antwi's (2010) study of Newmont Gold Ghana Limited in the Birim North District revealed adverse effects on the environment although the district had benefitted from the mining firm (Newmont Ghana Gold Limited) through employment, revenue generation, electricity extensions, etc. However, the mining activities from the findings of Antwi (2010), indicated an increasing level of environmental degradation and pollution in the communities.

George (2013), in his study on sand mining around Kerala River revealed serious repercussions on the environment as an Environmental Impact Assessment (EIA) established some negative impacts on the health of aquatic resources as well as land degradation caused by sand mining activities in the area.

Through the adoption of the pairwise ranking of problems, Kitula (2006), demonstrated that Tanzania's Geita district encountered water pollution due to the use of mercury and cyanide by mining firms. Again, excessive air pollution caused by dust from the mining operations, land

degradation, and the breakdown of buildings were recorded as key problems encountered in the area. It was found that about fifty-two houses collapsed as a result of the mining operations, with agricultural productivity being affected negatively including the degradation of lands for grazing (Kitula, 2006). Balanay & Halog (2016), using the Propensity Score Matching (PSM) explained that it was very reliable for estimating mining impacts in the Caraga province in the Philippines. The study found that the residents of host communities were significantly affected by environmental destruction as a result of mining activities. This indicates that mining in general has negative impacts on the environment as all the studies that have examined the impacts of large-scale mining operation on the environment revealed land degradation and water pollution as the main effect of mining.

3.2.3.4 Health Effects of Mining

Research on the effect of mining on the health of residents in host and neighbouring communities has been extensive (Eldoret & Chancery, 2013; Cohen, 2014; Wikle, 2014), and the findings indicate that the activities of large-scale mining subject human life to critical risk. Globally, mining constitutes one of the utmost perilous activities, encompassing minor to major incidence of injuries and deaths and adverse health implications like cancer and respiratory conditions, including silicosis, asbestosis and pneumoconiosis (Ahern and Stephens, 2001). An investigation by the Centre for Environmental Impact Analysis (CEIA) cited in Obiri-Danso, Adonadaga, & Hogarh (2011) posits that the use of mercury on the environment during mining operation finds its way into water bodies and easily precipitates into thin air. The absorptions of mercury by aquatic lives are triple beyond the acceptable level determined by the United States of America EPA as it affects the renal system, nervous system, gastrointestinal tract and respiratory system (Aragón & Rud, 2013). Similarly, Tschakert, Ricciardi, Smithwick, Machado, Ferring, Hausermann and Bug

(2016) indicate that mining operation causes pollution and emission of sulphur dioxide (SO_2), Nitrogen dioxide (NO_2), carbon monoxide (CO), etc., that are harmful to human health. Contact with mercury or copper could cause kidney ailments, breathing, central nervous and cardiac systems sicknesses, loss of memory, psychosis, reproductive glitches, etc. (George, 2013; Obiri, Dodoo, Essumang, & Armah, 2010; Tschakert *et al*., 2016).

In Ghana, mining operations, in whichever form, contaminates water bodies causing bio-accumulation in the bodies of aquatic animals and eventually entering into the food chain of human beings (Mensah, 2015). Furthermore, work-related injuries and other sicknesses such as lung cancer, musculoskeletal disorders associated with mining reduce the life expectancy of miners (George, 2013; Malinganya, Salatiel, & Renatus, 2013). In addition, noise pollution and mining vibrations due to rock explosions cause havocs to community buildings, restrict sleep, speech and hearing impairment among residents in mining communities (Yeboah, 2011; Enterprise Risk Management, 2013).

Moreover, due to immigration, prostitution is on the increase in mining communities through activities of sex workers, and the promiscuous lifestyle of people living in and around host communities which leads to an increase in sexually transmitted diseases such as HIV/AIDS (Cohen, 2014; Eldoret & Chancery, 2013; Opoku-Ware, 2014; Sinyangwe, 2012). There is an increase in the rate of prostitution and activities of sex workers in mining communities with many women resorting to prostitution as a source of income (Opoku-Ware, 2014; Wikle, 2014).

Furthermore, a study in the Geita District of Tanzania by Maliganya, Salatiel, and Renatus (2013) discovered some incidences of skin rashes and water-borne diseases resulting from pollutions through mining activities, as reported by respondents. The study recommended the need for government, investors, and other stakeholders to undertake a thorough cost-benefit analysis

relating to the socio-economic and environmental implications of mining towards safeguarding the interests of impacted local communities. A study by Boohene & Peprah, 2012 and Opoku-Ware, 2014 in some mining communities in Ghana such as Obuasi, Akwatia and Tarkwa concludes that people shifted from farming as their source of livelihoods due to pollution of water bodies coupled with the degradation of farmlands due to mining. The destruction of livelihoods in these communities increased household poverty, leading to high rates of mortality. Additionally, there was a reduction in the immunity levels of many children, hence their inability to withstand prevalent diseases like malaria. Also, the high mortality rates of children were associated with poor nutrition (Boohene & Peprah, 2012; Opoku-Ware, 2014).

Again, a study by Yeboah (2008), revealed contamination of rivers in five communities namely; Sanso, Anyinam, Anyinamadokrom, Abombe and Tutuka, around AngloGold Ashanti's mining enclave as well as incidences of respiratory infections, skin diseases, malaria, diarrhoea, fever and cold. About 42% of the residents suffered from malaria, followed by respiratory-related ailments which accounted for 27%, while skin diseases accounted for 17.7%, among other sicknesses. Again, the presence of arsenic pollution resulted in skin infections at Anyimadokrom, as a result of its closeness to AngloGold Ashanti's waste treatment unit. Also, people who lived at Abompe and Tutuka, which was 1.5-3 km away from the mining enclave also recorded other ailments of colds, skin diseases, fever and diarrhea (Yeboah, 2008).

3.2.3.5 Socio-cultural effects of Mining

One of the effects of large-scale mining in host and surrounding communities is the sociocultural twist associated with the speedy revolution in society's economic and social fabric. The social disorder begins to emerge due to disparities in income level and increased migration of people to

mining communities (Obeng-Odoom, 2014). Migrants of nearby communities compete with the indigenous people for limited public social amenities, generating social disorder and growing tensions in host communities. The sudden rapid change in the local economy and socio-cultural landscape creates and aggravates poverty, as observed among host residents' unwillingness to share job opportunities with migrants who are also prospecting for an opportunity but have failed to do so (Obeng-Odoom, 2014). According to Hill (2008), systemic social disorder and ills of alcoholism, drug abuse, prostitution, and child labour often set in and take an increased drive.

Scholars such as Eldoret and Chancery (2013) and Cohen (2014) indicate that aside from the socio-economic and environmental consequences of mining activities on the host and surrounding communities, the socio-cultural repercussions of exposure by the indigenous populace should not be underestimated. For example, the migration of mineworkers causes social disorder and increases social vices such as prostitution and crime. Again, migrant workers exhibit different behavioural deportments in sharp contrast to behavioural deportments of indigenous people from host communities, hence generating local resentments and apathies.

As a result of the increased remunerations offered by mining firms, a host community that over-relies on mining proceeds could suffer social disorder and distortions in income levels, hence creating a disparity in income between mining and non-mining households. In some cases, high attrition rate is observed in other sectors causing shortfalls in skilled workforce in those sectors, as many defer to the wage rewarding sector (mining). The intensive task schedules of mine workforce have been revealed to create family life distortion. The 12-hour work shift system as well as the continuous rosters impact negatively on families and the communities as a whole (Brereton & Forbes, 2004). It is more pronounced and constantly predictable as many men; unmarried or even married ones are detached from their sexual partners for a long period (Bryceson, Jønsson, & Verbrugge, 2014; Cohen, 2014). For instance, Sinyangwe (2012), and

Eldoret and Chancery (2013) indicate that the promiscuous lifestyle of people living in host and neighbouring mine communities have led to the increase of HIV/AIDS in areas such as Botswana and Zambia.

Again, the high level of stress and fatigue disrupt the natural circadian rhythms, causing inattentiveness and depression among workers in the mines. Also, addiction to alcohol as well as drug abuse impact adversely on their wages as they constantly depend on it to help maintain their disordered lifestyles.

3.2.4 Employment and Mining-Induced Displacement and Resettled

Mining-Induced Displacement and Resettled (MIDR) has been examined extensively by many researchers (Lange, 2011; Terminski, 2012, 2013; Abuya, 2013; Mensah & Okyere, 2014). Mining-Induced Displacement and Resettled (MIDR) is opined to occur when there is a significant upsurge in prices of goods and services, increasing demand for land, hence stimulating community displacement (Owen & Kemp, 2014). Kitula (2006), study on community livelihoods as a result of the socio-economic effects of mining in Tanzania using the framework of Participatory Rural Appraisal (PRA) found that the influx of mining firms and foreign migrants resulted in the competitive acquisition of land, hence made it difficult for the indigenous people to secure land. This development happened due to regulatory and policy gaps that favoured foreigners to the local communities' disadvantage. It is also observed in many unfortunate cases where promises by mining firms to provide compensation for the resettled are largely unfulfilled (Van Alstine & Afionis, 2012).

According to Solomon (2011), mining stimulates welfare improvements of job creation, increased financial well-being, and poverty reduction. For instance, it is established that in Botswana, employment increased in the educational sector (secondary and tertiary) due to the mining

operation of the Bamangwato Concessions Limited leading to the generation of income. The creation of one thousand mining employment expanded to support 25 000 locals. Again, studies by Betz, Farren, Lobao and Patridge (2014) in the Appalachian area in the US on the effects of coal mining revealed that a large number of transient workers benefited from the mining jobs. Besides an increment in entrepreneurial activities, there was an increase in the prices of goods and services especially luxury goods due to an increase in the purchasing power of mine workers. According to Deller and Schreiber (2013), there was an increase in employment opportunities for host and neighbouring communities, and that mining generated employment in both related and unrelated sectors.

Furthermore, Amankwah and Anim-Sackey (2003) revealed that mining had decreased rural-urban drift, stimulated local economic growth and reduced poverty. The research also established a drastic transformation of many unskilled labourers to semi-skilled as well as skilled labourers. Even though mining offered higher incomes for the rural folks, the effects of the higher incomes were neither investigated nor did the research establish the skills which were being acquired by mine workers. Regarding employment, Obeng-Odoom (2014) expounds that despite the fact that Nigeria remains a very wealthy country in Africa as a result of its oil production, there is a vast gap between the rich and the poor largely due to unemployment, as the poor were not workers in the oil industry.

At the micro-level, Solomon (2011) and Deller and Schreiber (2013) found that mining activities increase employment opportunities at the micro-level. Nevertheless, at the macro-level, Biyase and Bonga (2007) and Leshoro (2014) discovered that mining firms sought to raise workforce productivity and efficiency by adopting innovative technologies and improved equipment. Notwithstanding a demand increase for diamonds in Botswana, Biyase and Bonga-Bonga (2007) and Leshoro (2014) revealed that growth was witnessed in the country. However, with no increase

in employment rate. The evidence revealed by Biyase and Bonda-Bonga (2007) and Leshoro (2014) varied from the conclusion of Cornish (2012, 2013), who found that mining operations in Botswana's Jwaneng area indeed increased employment rates, causing an improved standard of living for locals within the community.

Ghana has, over the years, seen an influx of economic migrants who have moved to host communities, creating what is called in-migration (Obeng-Odoom, 2014). This is usually accompanied by rippling sectorial declines, for example, in areas of agriculture as many people become interested in the mining sector to the detriment of other sectors such as farming, fishing and other already existing livelihoods of the people. Despite these developments, Obeng-Odoom (2014), posit that mining offers jobs to 15,000 to 18,000 people, representing about 1% of the country's entire workforce. According to this study, this is because of the capital-intensive nature of the sector; hence only few employment opportunities exist for the local people. He also mentioned that host communities in Ghana lack the required skills to fill management roles in mining companies, as their skill level is applicable for low-level entry and temporary work; hence they do not benefit in the long-term compared to those in permanent positions. This situation creates employment insecurity since those temporary roles do not offer sustainable income (Obeng-Odoom, 2014).

Mining operations, especially large-scale mining-induced displacement in mining communities which if not monitored well lead to negative consequences. Concessions of mining companies sometimes include communities due to the mining laws which demand that persons living close to mining concessions should be 500-meter radius beyond. For the mines to be able to exploit for gold, persons living within a 500-meter radius to the mines are resettled or relocated (Terminski, 2012, Twerefou et al. 2015). Normally, victims of mine-induced displacement are faced with a lot of challenges although mining companies provide resettlement packages to affected persons and

households (Owen and Kemp, 2014). However, Twerefou et al. 2015 argue that compensation packages are inadequate to prevent the impoverishment of resettled communities neither to restore their livelihoods.

The operations of PMGL have resulted in the displacement of persons from their places of abode. In total, 1,147 people from three communities, namely, Festish, Ensugya North and Kyereawewa were resettled to a new location called Kurofofrom (resettled community). This is in line with some authors who have stated that mining leads to some negative impacts such as water and air pollution, the health of the indigenes, land degradation, displacement disruption of livelihoods of affected persons and unemployment (Como and de Walque, 2012; Darimani, 2015; LillyWhite et al., 2015).

PMGL has acquired 216.78 acres of land resettlement facility, which includes 187 houses, 12 institutional buildings, including two schools, three churches, a 13-unit commercial facility, and a community centre. Modern houses have been built for affected persons with well-laid out roads. Respondent at the resettlement site boasted of a newly built police station, churches, schools and library. Respondent expressed gratefulness for the provision of modern houses compared to their former places. Nevertheless, it was revealed that respondents were faced with challenges such as high utility bills, lack of economic activities and long distances to their farms.

The Mineral and Mining Regulations 2175, 2012 requires that a committee is constituted to negotiate with mining companies on behalf of the local residence on compensation packages for affected persons. Per the regulation, mining communities are permitted to consult a qualified private entity if the community lacks persons with expertise in the area of negotiations and valuation. The regulation also states that the mining company must pay any consultant consulted to negotiate on behalf of host communities. As such, a committee was instituted with persons from

the community and government institutions to negotiate on behalf of the communities, which is the mining and resettled communities. However, respondents of the FGD in the mining and resettled communities claimed that the committee has been corrupted by the mines to cheat them of compensation due them. Again, respondents claimed that the committee did not consult and briefed them on happenings during the negotiation processes. This claim was refuted by the Chief of Ayanfuri, and stated that the committee from day one has sought the interest of persons affected by the mines.

The study sought to find out whether respondents who have been compensated were satisfied with their compensation packages. Some respondents mentioned that they were not satisfied with how their land was valued and the monies given to them as compensation. Lack of consultation during the resettlement process was mentioned as a challenge with compensation packages given to them. Respondent indicated not having detailed information through which the resettlement negotiations were made. Some accused their representative on the compensation committee of conniving with the mines to cheat them. However, some respondents whose houses were affected indicated satisfaction with the new modern houses built for them which is better than where they use to live.

3.2.5 Infrastructure and Social Amenities

The discovery of any mineral is expected to lead to job creation, construction of educational infrastructure, provision of health facilities and local economic growth and development (Obeng-Odoom, 2014). Several studies have focused on the macro-economic development of mining (Adada, Aggesen, Hansen & Lund, 2012; Farole & Winkler, 2014; Jacobs, 2013). Petkova-Timmer *et al.* (2009) carried out a study to investigate major mining impacts through a comparative analysis of six mining areas in the Bowen Basin enclave in Australia during the 'boom and bust period of coal extraction. The findings revealed that mining contributed to population growth,

increased financial support and community diversification, the increased value of land, schools for host communities, improved health infrastructure, and many other social amenities in the host communities. Van Alstine and Afionis (2012), however, established varied findings, through their explanation, the provision of infrastructure and other facilities in host communities are in the actual sense meant to benefit the mining firms and as well as the mineworkers from outside the host communities. Thus, the indigenes are not the direct beneficiaries of the housing infrastructure, health facilities, or scholarship opportunities. Similarly, a study by Maliganya, Salatiel, and Renatus (2013) in the Geita District of Tanzania found minimal contribution from Geita Gold Mine as responses from most respondents indicated a minimal direct (construction of educational and health facilities) and indirect socio-economic benefits to their livelihoods.

3.2.6 Mining and Poverty Reduction: Key Linkages

Large-scale mining links in driving growth and poverty reduction may assume the dimensions of direct or indirect employment, income generation avenues, and the creation of economic prospects for growth (Aubynn, 2009). The enormous indirect benefits via various investment linkages stimulate improved social services delivery and augment physical infrastructural development.

Globally, proceeds gained from taxes and loyalties through mining activities form a significant revenue base, supporting national interventions towards reducing poverty.

At the local community level, most large-scale mining activities tend to affects the poor economically. However, the LSM can offer many extra job prospects, with an improved income-generation stream arguably better than, if not all, other jobs in the area. Also, it can inspire investments in the provision and expansion of social infrastructural services delivery with collective access to; transport, water, and power (Obeng-Odoom, 2014). The significant downstream business and sideway economic drive from the supply value chain, the refiners,

generate jobs prospects for those not directly involved in mainstream mining. Successful mining activity can also stimulate additional private sector investment, nationally and at the local level when large scale mining assumes a complementary role to help address poverty gaps in a supportive policy context underpinned by viable regulatory guidelines (Kogel, Trivedi, and Herpfer, 2014; Tonts, Plummer, and Lawrie, 2012).

3.2.7 Corporate Social Responsibility

Many organisations face ethical concerns in their daily operations, prompting them to either initiate improvements or undertake unethical behaviours (Nielsen and Massa, 2013). One of the methods considered a constructive response to ethical issues is Corporate Social Responsibility (CSR), a voluntary self-regulatory initiative by which an organisation upholds ethical and legal business initiatives (Acquire, Gond, and Pasquero, 2011). According to Garrigue and Mele (2004), CSR involves initiatives or programmes that offer back to the host community and stimulate environmental sustainability. These initiatives or programmes may differ from one organization to the other. Ioane and Seraphim (2015) also describe CSR as a social intervention that assumes a contractual relationship between a firm and the community where it operates. Four (4) theoretical components are involved in CSR. They include profits, social demands, political performance and ethical values (Garrigue & Mele, 2004). According to Garrigue and Mele (2004), these four (4) components can aid in understanding and predicting organizational activities relating to CSR.

From its commencement in the early part of the 1960s through to 2015, the history of the construct has undergone quite a lot of transformations, from a movement status among a few organizations and scholars that were socially conscious to attaining a legal responsibility status (Carroll, 2015). Theorists of CSR believe that organizations have the ethical responsibility of considering the

interests of their customers, staff, shareholders or investors, and communities, and the ecological influence in every aspect of their operations (Babalola, 2012; Garrigue and Mele, 2004).

3.2.7.1 Corporate Social Responsibility in the Ghanaian Mining Industry

CSR is considered one of the increasing social initiatives in the Ghanaian mining industry due to the immense destruction and consequence of the operations of the mining companies (Sadik, 2013). Normally, CSR is seen as a way through which the mining company can give back to society following the increasing level of destruction and mess that results from mining operations. The relationships between the indigenous people in mining communities and mining firms are essential (Rogerson, 2012; Adimazoya, 2013). Through the integration of the community and mine workers, Adimazoya (2013) and Rogerson (2012) posit that there would be improved relationships between the state and mining firms. Similar to Adimazoya (2013) and Siegel (2013), Lawson & Bentil (2014) suggest that improved transparency and information with host communities is a viable solution for mining companies. The mining companies give back to society as part of their corporate social responsibility in the form of infrastructure and many others.

Furthermore, Murombo (2013) established that enforcing strict regulations could help in ensuring compliance of mining firms to mine sustainably and administer appropriate compensation measures to award host communities for extraction of the natural resource. On the other hand, Lawson and Bentil (2014) proposed that proper management of CSR, wherein the gold mining firms endeavour to channel these initiatives into quantifiable improvements for the Ghanaian people, would be a laudable first step in creating and fostering these relationships.

Contributions of mining companies by way of fulfilling their CSR in 2014 was about $21 million (Ghana Chamber of Mines, 2015). Under the AKOBEN for instance, a mining firm can hardly attain the GOLD ranking status with no formalized CSR policy (EPA AKOBEN, 2010). This has

significantly contributed to the Ghanaian economy and enhanced national development (Ghana Chamber of Mines, 2015). The establishment of laws could potentially facilitate both the development of mining communities and increase sustainable mining operations. Nevertheless, the unavailability of information among mining companies in Ghana, even to the mineral authority and the resources commission has stifled effective enforcement of these policies (Adimazoya, 2013; Sackey *et al*., 2013). Notwithstanding some policy regulations that establish the need to share proceeds between the state and mining firms, citizens of Ghana yet still benefit little from the extraction of their resources (Lawson & Bentil, 2014; Standing & Hilson, 2013).

According to Murombo (2013), mining firms must find appropriate ways to enhance the livelihood of indigenes within the mining catchment areas where they operate and internalise sustainable mining guidelines. For instance, in cases where children are employed as labourers in mining sites due to poverty, the situation could be mitigated through the provision educational facilities by the firms in the mining areas. (Hilson, 2010). Armah *et al.* (2011) and Preuss *et al*. (2016) indicate that the lack of a benchmark for CSR in terms of legislation within the gold mining industry in Ghana may contribute to the inconsistency in undertaking CSRs. Furthermore, poor enforcement of policies regarding profit sharing and CSR might influence firms' perception of their ability to meet their fiduciary responsibilities within the mining industry in Ghana (Abugre, 2014; Carroll, 2015).

3.2.8 Coping and Alternative Livelihoods Strategies

Davies 1993, 1996; cited in Dercon (2001) defines coping strategies as the short-term strategies applied by households in periods of crisis. The coping strategy is applying all available resources and capital assets in dealing with uncertainties and vulnerabilities relating to livelihoods. Individuals and households differ in their capability to cope in periods of crisis. Similarly,

Bhattarai (2005) asserts that coping strategies are put in place to lessen the adverse impact of unexpected changes. Coping strategies are commonly practised among poor households to reduce and escape from livelihoods' uncertainties and stress throughout the year. They may include changing consumption patterns such as reducing the quantity or quality of foods, postponing entertainments, etc.

Several calls have been made for more responsible mining firms and governments to provide indigenes with a sustainable source of livelihoods due to the various mining effects on the host and neighbouring communities (Banchirigah, 2008). Consequently, alternative livelihood programmes have been designed for indigenes of mining communities by mining firms and governments worldwide. Alternative Livelihood Programmes (ALPs) in host and neighbouring mining communities offer different sources of employment and revenue opportunities for indigenous people who lost their livelihoods or prime occupations to mining operations. According to Bush (2009), the notion of alternative livelihood does not apply to only the mining sector but several other sectors like fishing, forestry, oil drilling, construction, etc. In implementing such programmes, several approaches have been deployed depending on the resources available, residents' needs, capacity, and the agency's goal of implementing such programmes. Examples of approaches drawn from many countries across the world reveal mixed results. For example, in Bolivia, residents in host communities received training in alternative activities like improved farming methods. Again, was the provision of start-up incomes, fertilizers, insecticides, etc., to be used on their farms.

Furthermore, marketing of farm outputs was done by many marketing organizations employed by mining firms with capital provided for the purchase and transportation of produce to market centres. Also, there was the provision of storage facilities to salvage situations where the supply of farm produce was in excess. Additionally, local traditional crafts were being promoted and the

training of residents to take the opportunity of the emerging tourism trade in mining communities (Banchirigah, 2008). A related approach was adopted in Tanzania whereby residents received training in animal rearing (for example, sheep, goats, grass cutter etc.) as an alternative source of livelihood. Construction of offices was done to cater separately for related investment issues. Residents received advice before being trained, with subsequent monetary assistance for investing in such ventures (Curtis and Lissu, 2008). Sievanen, Crawford, Pollnac, and Milne (2005), examined seaweed agribusiness as a substitute for artisanal fishing in the Philippines and Indonesia.

Although the literature on the ALP is not extensive, a quick overview and a brief review shows that most ALPs executed in mining areas, particularly in developing countries were most often forced on the people without adequate engagement. Furthermore, Carson, Cottrell, Dickman, Gummerson, Lee, Miao, Teranishi, Tully, and Uregian (2005) revealed many re-tooling schemes assumed under the ALP had had less substantial bearing due to the unavailability of funds for participants to initiate their businesses.

3.3 Perceptions of mining communities on the effects of large-scale gold mining

Gold mining in the societies is seen to contribute significantly to the development of communities and nations at large. However, gold mining in the communities due to the effects on the society have led to the development of apathy among the members of the community within which mining operations are carried on (Agyei, 2016). Issues of socio-economic impact is seen to have resulted in a mix perception on the employees of the society. The perception of socio-economic impacts of mining according to the literature among Kenyans ensure an increase in the daily income to USD 140 (Barreto, 2018). Barreto, 2018, however identified that the income of the miners are many

times greater than the farmers. The source of income for indigenes of these communities included the sale of food, beverages etc.

The perceptions on the socio-economic impact of mining on host communities is a mixed one. Others are of the view that it provided employment, while others felt it increased the unemployment rate in the communities, since it led to the loss of their farmlands, which were hitherto a source of employment for the people. Others also believe that, mining brings about an increase the rate of social vices, reduce quality of water and land, and impacts negatively on productivity (Widana, 2018). Others therefore believe that if these issues are not addressed, there is the propensity that these may lead to tension and social unrest. This is because local communities perceived mining activities as being economic avenues for improving the national economy, their role being an available workforce to ensure their country prospers economically. This has changed in the last five decades as local communities view mining activities in their localities as solutions to their pressing development challenges (Malinganya, 2013). The change in view has exerted pressure on mining companies and government to re-think the role of mining in the country as a whole, considering the complexities of development challenges and the interest of capital owners (KPMG, 2014).

As such, the governments have enacted a legislative framework to regulate the operations and responsibilities of mining companies, one of the responsibilities being to improve the socio-economic conditions of local mining communities. However, the literature suggests that stakeholder engagement has not been a priority for most mining companies (Saul and Bond, 2014). As a result, local communities are nervous about being excluded from the benefits accruing from mining activities and do not have access to information regarding their future involvement in the local mining industry (Kabemba, 2014). This scenario contradicts the transformation agenda of the sector that the South African government has been campaigning for post-independence.

Therefore, as fear and mistrust continue to beleaguer relations between mining companies and local communities.

3.4 Theoretical Framework

According to Creswell (2009), a theoretical framework is an empirical or quasi-empirical theory of unique and psychological process at a range of levels that can be applied as a 'lens' to understand a phenomenon. Thus, it brings out the rationale for conducting a study. The theoretical theory for this study will be the stakeholder theory and the Sustainable Livelihood Framework. This section focused on the theoretical concepts and approaches that have been used in the study based on available literature reviewed. The theories were selected due to their appropriateness and their explanatory power of the phenomenon studied.

3.4.1 Stakeholder Theory

Edward Freeman developed the Stakeholder Theory in 1984. Stakeholder theory has achieved widespread popularity among academics, media practitioners and managers who have since used the concept and subjected it to differing interpretation. It requires managers to articulate the shared sense of the value they create and what brings its core stakeholders together. The pre-and post-Freeman (1984) stakeholder approach grew out of management practice. Freeman (1984) further opines that the idea of stakeholders, or stakeholder management, or a stakeholder approach to strategic management, suggests that managers must formulate and implement processes that satisfy all and only those groups who have a stake in the business. The focal task of this process is to manage and integrate the relationships and interests of shareholders, employees, customers, suppliers, communities, and other groups to assure the long-term success of the firm (Freeman,

1984). The stakeholder management or stakeholder approach is said to be fulfilled by the managers of a company.

However, managers should manage the corporation for the benefit of its stakeholders to ensure their rights and participation in decision making. Again, the management must act as the stockholder's agent to ensure the survival of the company and the long-term stakes of each group (Freeman, 1984). In other words, if an organisation will survive, it depends on the extent to which managers engage stakeholders in decision making. Freeman postulates that firms do not operate to profit from their shareholder alone, but they also concentrate on other groups who have a stake in the firm. Thus, the survival of a firm depends largely on meeting the varied needs of stakeholders. Overall, the stakeholder concept understands an organisation being a system of different components with diverse interests about what the organisation should be and how it should function. Friedman and Miles (2006) state that the organisation should be conceived as a grouping of stakeholders, and the goal of the organisation and management should be directed towards managing their needs, desires and viewpoints. The various constituents of an organisation make up the stakeholders; for instance, shareholders, customers, suppliers, employees, local communities, the government and the general public. Stakeholders need to be managed well to retain their interest and participation in the organisation to ensure the survival and continuing profitability of the corporation (Clarkson, 1995). This theory suggests that organisations are in a constant relationship with their stakeholders and that organisations' success largely depends on their ability to maintain trustful and mutually respectful relations with the various stakeholders (Kunetsov, Kuznetsova & Warren, 2010).

The stakeholder theory also holds that businesses can be seen as systems whose survival depends on their ability to satisfy a particular set of audience known as stakeholders who can be identified by their rights, ownership, or interests in a business and its activities, past, present, or future

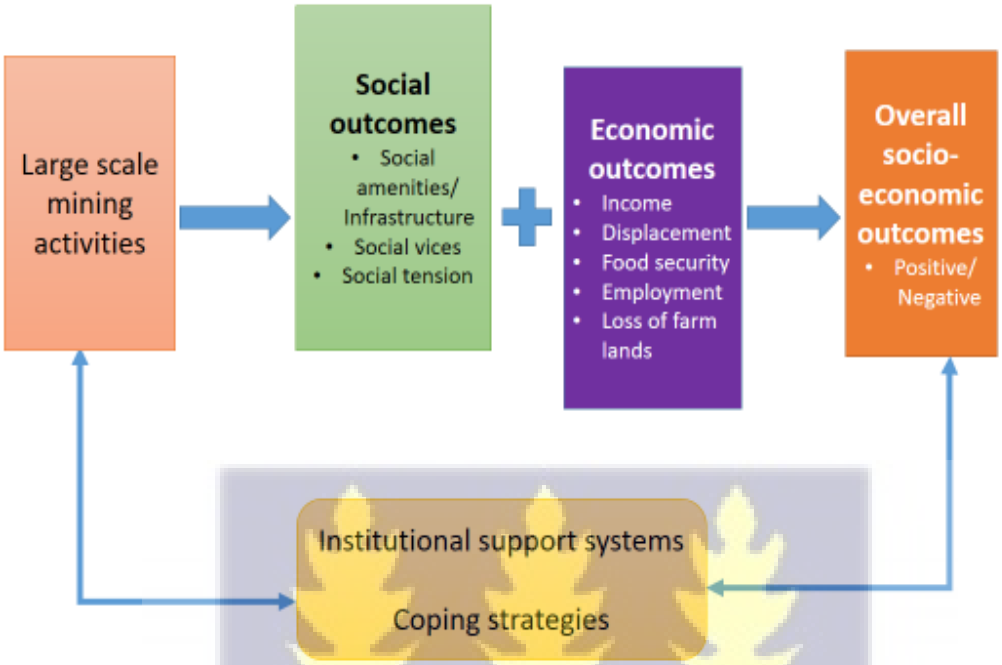
(Blomback & Wigren, 2009). The Stakeholder theory, however, does not list specific stakeholders of a firm. From this theoretical perspective, the work of a manager is to support all these groups, carefully align the varied interest of stakeholders by making the organisation a place where their interests can be collectively maximised (Robins, 2008). Considering the vital role that stakeholders play in organisations, managers should pay attention to the demands and rights of essential stakeholders as a valuable tool for developing socially responsible projects (Maigan & Ferrell, 2004). The stakeholder approach has become one of the largest domains within the mining sector for the last few decades. According to Freeman (2006), involvement of community engagement will usher in an era of a sense of belonging, as opposed to the current sense of alienation, which seems to have taken strong root. This theory will help the researcher determine whether Perseus Mining Limited engages its stakeholders in decision making to limit the adverse socioeconomic effects of mining on host communities.

A well developed and improved mining sector can become a major growth centre to the benefits of Upper West Denkyira District residents and the rest of Ghana. This study is based on the notion that mining can enhance the socioeconomic wellbeing of host and nearby communities when stakeholders are involved in the lifecycle of mining, from discovery to closure.

3.5 Conceptual Framework

The conceptual framework was modelled on the socio-economic effects of gold mining and the institutional support systems available to maximize the positive effects and minimize the adverse effects of mining which will provide coping strategies to affected households, to enhance the livelihoods of indigenes in Ayanfuri, Kurofofrom and Nkutonsu. Figure 5 represents the conceptual framework that has been applied in the study. The framework shows how large-scale gold mining operations affect the livelihoods of the people in the Upper Denkyira West District.

Figure 5: A framework for Analysing Large-Scale Mining Operations effects on communities



Source: Author's Construct, 2017 based on the Livelihood Framework of DFID (1999)

Conceptually, the operations of the large-scale mining will lead to some perceived positive benefits such as employment, improved infrastructure, improved income and reduced vulnerability. However, it is also perceived that their operations will yield some adverse social effects such as loss of livelihood, displacement, social tension, social vices, and economic effects such as high cost of living, food insecurity and loss of farmlands. As expected affected household in their pursuit to improve their livelihoods, tries to adopt coping strategies to curb or lessen the adverse effects to improve their livelihoods. All things been equal. With a collaborative stakeholders engagements such as government, traditional leaders, civil society organizations (CSOs), mining

firms and host communities affected household will attain successful coping strategies to curb the adverse effects of the mining activities.

3.6 Conclusion

The chapter examined literature on the social effects of mining. The chapter established the effects LSM has on agriculture and food security, health, environment, socio-cultural, employment and displacement. The chapter also discussed coping and alternative livelihoods strategies, the perception on the effects of LSM on host communities, theories and conceptual framework of the thesis.

CHAPTER FOUR

METHODOLOGY AND STUDY SITES

4.1 Introduction

This chapter focuses on the profile of the study sites and the research methodology employed for the study. The chapter encompasses details on the various components, including the research philosophy, the research design, the data collection approach, and the study's analytical tools.

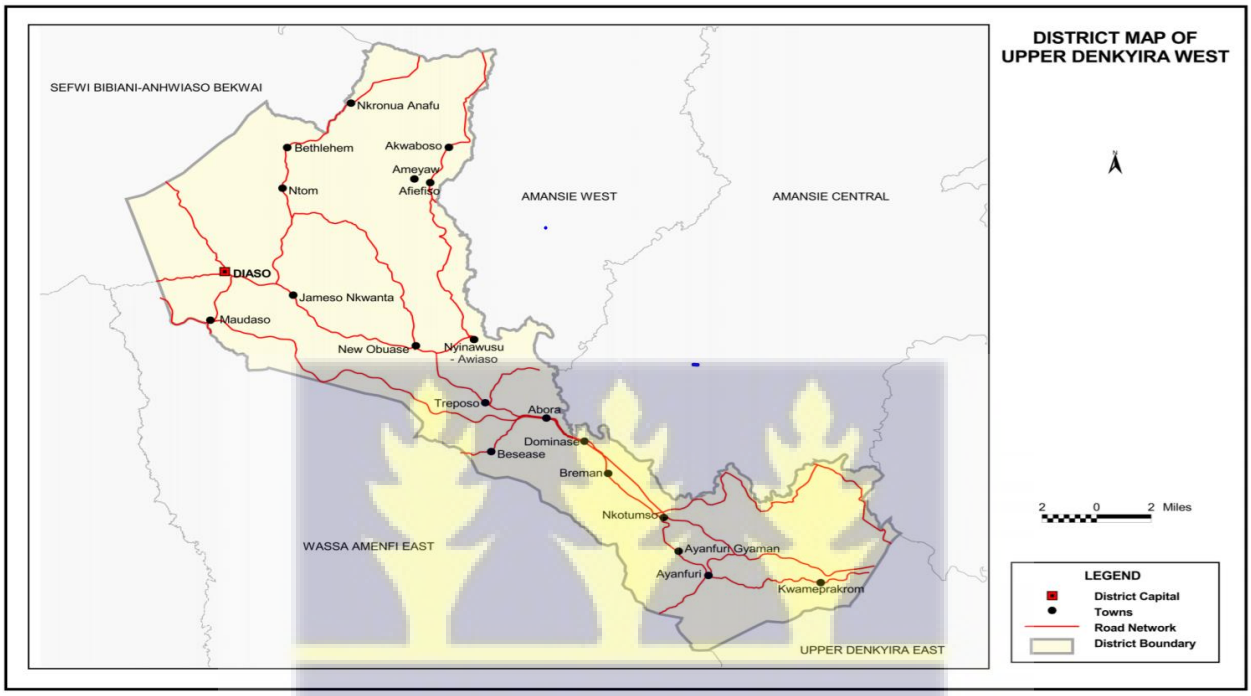
4.2 Background characteristics of the study district and sites

The Upper Denkyira West District is one of the 260 Metropolitan, Municipal and District Assemblies (MMDAs) in Ghana and forms part of the 22 MMDAs in the Central Region. It was carved out of the erstwhile Upper Denkyira District. To ensure effective administration and holistic development, Upper Denkyira West became one of the two offshoots of the split. It was established by a Legislative Instrument (L.I. 1848, 2007) and was inaugurated in February 2008 with Diaso as its capital. The mission statement of the Upper Denkyira West District Assembly is that "It exists to improve the quality of life of the people in the District through the formulation and the implementation of sustainable programmes and projects by efficiently and effectively applying all available resources". Its vision is "To have a well-developed District with basic socio-economic infrastructure and services available to the people".

The Upper Denkyira West District lies within latitudes 5º 30' N and 6º 02' N of the equator and longitudes 1º W and 2º W of the Greenwich Meridian and has a total land area of 579.21 square kilometers, which represents 3% of the total land area of the Central Region. It shares common boundaries with the following districts: Babiani Ahwiaso Bekwai Municipal to the north, Amansie West District and Amansie Central Districts to the east, Wassa Amenfi East Municipal and Amenfi

West Municipal to the west, and Upper Denkyira East Municipality to the south. According to the 2010 population and housing census, the District's population stands at 60,054, with 30,193 males and 29,861 females (GSS, 2010).

Figure 4.1: Ghana Statistical Service (2010): Upper Denkyira West



4.2.1 Profile of Perseus Mining Ghana Limited

Perseus mining is a multi-mine gold producer, developer and explorer who practices open pit mining in West Africa currently operating in Ghana and Cote d'lvoire. Perseus first came to Ghana in January, 2014 as "The Edikan Gold Mine (EGM) in the Upper Denkyira West District in Ayanfuri and Nanankwa communities with concession approximately 94km2. Government of Ghana owned 10% interest while Perseus owned 90% interest. Through cooperate social responsibility, PMGL has set up the Edikan Trust fund for community projects, an established client service and engages in periodic community engagement. PMGL has undertaken several projects such as Ayanfuri resettlement, road construction and improvement and local employment

and services. Perseus Mining Ghana Limited has contributed $3.9 million to the Edikan Fund to be used by community to undertake developmental projects. PMGL has created 2,340 jobs which includes 899 from local communities (Minerals Commission, 2015).

4.3 Justification for the selection of the study sites

The study selected the Upper West Denkyira District for the study because there were news flashes of agitation and unrest in the mining community against PMGL which got the researcher interested to go on the ground and investigate what the actual situation was. The three selected communities were Ayanfuri, Kurofofrom, and Nkutonsu communities directly or indirectly have been affected by gold mining activities. Ayanfuri (the active mining community), Kurofofrom (the resettled community) and Nkutonsu (the nearby non-mining community) as such were used as the control group to explore possible variations of effects of mining.

Ayanfuri was an active mining community where the activities of PMGL takes place which project is located 16 km west of Dunkwa-on-Ofin. The community was selected because it is an active mining community considered for the case study.

Kurofofrom (resettlement community)

PMGL in its quest to abide by the mining regulations of Ghana which states that communities or households should be 500 meter redius away from any mining sites. PMGL, therefore relocated 1,147 people from three communities, namely, Festish, Engugya, North and Kyereawawa. The resettlement site covers 216.78 acres of land which comprises of 187 houses, 12 institutional buildings including two schools, three churches, 13-unit commercial facility and community facility and community centre and it from the about 1.5 kilometre mining community. There is also a police post, fire point and a community water and sanitation agency. The resettlement

community can also boast of street lights. The community was chosen because it is directly linked to PMGL and the researcher wanted to investigate whether there exist socio-economic effects associated with the resettlement and how they were coping with it.

The nearby non-mining community considered for the study was Nkutonsu, which is about 2.5 kilometres from the mining community was selected as a control group. The community was selected because they exhibit similar characteristics to the experimental communities, which therefore provided room for comparisons and to help with proper attribution. The communities were chosen to aid in the investigation of whether the socio-economic effects of large-scale mining are related to proximity, and whether the effects vary from community to community.

4.4 Pilot Survey

A pilot survey is a strategy used to test the questionnaire using a smaller sample compared to the planned sample size. In this phase of conducting a survey, the questionnaire is administered to a percentage of the total sample population. The study conducted a pilot survey using 25 individuals in the selected communities to test the provisional research instruments and to gather information to finalise the research instrument. The pilot study also helped to determine the feasibility of the study as well as to identify possible challenges that may come up during the actual study.

4.5 Research Design

Polit and Beck (2012), describe research design as the comprehensive scheme for acquiring answers to questions being studied and handling any relevant obstacles to the study. The study employed a mix method approach involving both qualitative and quantitative data collection techniques. A case study approach was adopted for this study to help gain in-depth information into the socio-economic implications of large-scale mining activities on a host, resettled and nearby non-mining communities in the Upper Denkyira West District of Ghana. According to

Creswell, a case study approach to research involves a detailed examination of a particular issue to get in-depth information (Creswell, 2013). A case study approach gives the researcher the leverage to respond to the how and why questions to get intensive and very extensive knowledge; hence most research on the effects of mining employed the case study approach (Johnston, 2014; Yin, 2003). The researcher employed a case study because this research involves investigating the effects of large-scale gold mining activities on local communities at the Upper Denkyira West District, specifically Ayanfuri, Kurofofrom and Nkutonso.

4.5.1 Philosophical basis for the study

The research focuses on underlining the socio-economic effects of mining activities on local communities. The philosophical approach adopted and used for this study is the pragmatic approach. Pragmatic philosophy adopts the notion that one point of view can never give a complete picture, as multiple realities exist (Yvonne, 2010). According to pragmatism research philosophy, the research question is the key determinant of the philosophy in research (Creswell & Clark, 2017). Pragmatics mostly combine both positivist and interpretivism positions within the scope of single research according to the nature of the research question (Guest & Fleming, 2014; Wilson, 2014). Therefore, this research employed a mix-method approach, involving qualitative and quantitative data collection techniques, to answer the main research question 'what are the socio-economic effects of large-scale gold mining on communities in Ghana. To examine the perceptions on the social effects of mining and adaptive strategies adopted by affected to curb the adverse effects of mining, objective two and three, qualitative research was the best method to get in-depth knowledge.

Focus Group Discussions (FGDs) and Key Informant Interviews (KII) were used to gather the qualitative data through face-to-face interactions and observation. This is because the researcher

was better placed to understand the issues being researched. Respondents of FGDs were allowed to express their subjective opinions on issues discussed. On the other hand, the quantitative approach enabled collecting data from a large sample of households to assess the effect of large-scale gold mining on the communities in the Upper Denkyira West District in the Central Region of Ghana. This provided numerical data to explain the phenomenon addressing objectives 1 and 2 of the study, and the findings are presented in Chapters Five and Six.

4.6 Data source and data collection

Bryman, 2007, notes that the techniques and instruments for collecting data play significant roles in answering research questions and objectives effectively. Collins (2003) asserts that primary data are from original unique sources gathered with a definite research question in mind. Primary data was gathered from the three selected communities in the Upper Denkyira West District and other stakeholders. Government institutions and traditional authorities were also sampled. The secondary data for the study was gathered from literature relevant to the study, published and unpublished books, journals, organisational reports and some other literature deemed relevant for the study. The primary data consisted of quantitative and qualitative data collected through semi-structured questionnaires and interviews. This structured questionnaire included administering questionnaires to clients whilst the interviews include personal (face to face) interviews using non-participant observations of counsellors. Key informant interviews were also used to collect data. Participant and Non-participant observations were undertaken to describe the institutional support systems available and local adaptation strategies adopted by the households to curb the adverse effects of mining on their livelihoods.

4.6.1 Interviews

According to Saunders, Lewis and Thornhill (2009), an interview allows the interviewer to deduce the fundamental relationship between variables. Since this study intended to examine the socio-

economic impacts of large-scale mining, an interview allowed the interviewee to lead the conversation into areas that address the research questions of the researcher (Fisher, 2004). Interviews were used to collect data for the household survey. Key informant interviews also gave the researcher in-depth information about relevant issues to the study that other respondents could not provide.

4.6.2. Focus Group Discussion

Focus Group Discussion (FGD) was adopted for this study because it is economical and efficient in obtaining data from multiple respondents. Also, the sense of belonging to a group can increase the respondents' sense of cohesiveness and make them feel safe to share personal problems (Bryant, 2015; Regan and Dillon, 2015). According to Krueger and Casey (2014), the essence of a focus group discussion is to allow respondents to express themselves and share in-depth knowledge of issues. Focus group discussions should comprise about 5-10 individuals (Jakobsen, 2012 and Krueger, 2014). In this study, the number of people in each FGD were eight both males and females which were between the ages of 30 to 60 years and had stayed in the community for at least ten (10) years who the researcher believed would have a vast knowledge on issues discussed. Discussions within the FGD groups were relaxed, and everyone had the right and opportunity to share their views at any time.

4.5 Sampling Procedure

The best approach to get knowledgeable and insightful contributions of a study under investigation is purposive sampling (Atindabila, 2013). Purposive sampling is very common with qualitative and case studies research as it can provide much in-depth into the issue. This study employed purposive sampling in the selection of respondents for the key-informants' interviews. In all, a

total of five (6) respondents comprised two respondents from traditional authorities, a respondent from Upper Denkyira West District Assembly, the mining company, health authority and supports systems in the district. Respondents were selected based on their in-depth knowledge on issues discussed. The snowballing method was employed to select respondents for the focus group discussion who shared common characteristics such as people who have either lost farmland or place of abode or both farmlands and place of abode. People who have neither lost land nor place of abode were also considered. The first respondents in all the three communities were identified during the piloting stage of the study where they were asked to refer the researcher to someone who have an in-depth knowledge on the research topic. This process was used till the researcher obtained sufficient respondents for each FGD.

For the household survey, systematic sampling was employed in all three communities to choose the respondents. Jonnie (2012) defines it as a probability sampling procedure in which a random selection is made or the first element for the sample, and then subsequent elements are selected using a systematic interval until the desired size is reached, a larger population can be selected at any random starting point with a fixed periodic interval. The interval is called the sampling interval and it can be calculated by dividing the population size by the preferred sample size.

It can be represented as: K=N/n.

Where, N= population size

n= sample size

Then, the Kth item for each community was calculated to proceed systematically. In selecting the respondents, the researcher used a modified systematic random sampling technique where she first identified the needed sample size for each of the communities. The researcher therefore divided the total population of each community by the sample sizes to obtain the sampling interval which was then used as the constant difference subjects upon which respondents were selected. As a

result, a total of three hundred and fifty (350) respondents were interviewed for the household survey from the three communities – 150 from the mining community, 100 from the resettled community and 100 from the nearby non-mining community.

Systematic random sampling was used to select 350 respondents for the household survey.

4.6.1 Sampling Frame

For the surveys and focus group discussions, the data was collected from individuals above the age of 18 who were based in the selected communities. In total, six focus group discussion was used for the qualitative data. There were two focus group discussions from each of the three communities. The quantitative data sampled household heads in the three communities for the household survey. In the absence of the household heads, any person found in the home thirty years (30) and above was interviewed. For the household survey, in all, three hundred and fifty respondents (350) were interviewed in all the three communities – 150 from the mining community, 100 from the resettled community and 100 from the nearby non-mining community. In all, one hundred and nineteen 199 (56.9%) females and one hundred and fifty-one (151) representing (43.1%) males were interviewed for the survey.

4.6.2 Target population

The targeted communities for the study were; Ayanfuri (the active mining community), Kurofofrom (the resettled community) and Nkutunso (the nearby non-mining community). Before considering a sample size for a study, the population needs to be determined first. The population is defined as the total of all units that have one or more standard features. If the research problem is not well defined, finding the population might be the hardest thing in the sampling process (Robson, 2011). In this study, the study population comprised key informants of the mining firm

(Perseus Mining Limited) and stakeholders. The stakeholders included traditional leaders, health officials, affected communities, a nearby community, and a resettled community.

4.7 Data processing and Data analysis

4.7.1 Quantitative Analysis

The returned questionnaires were cleaned and edited to ensure completeness and accuracy before they were coded and entered, and analysed using STATA version 15. Descriptive statistics such as frequencies, tables, graphs and percentages were used to explain what is observed. In addition, a chi-square test of significance was applied to analyse the data to establish relevance and the associations between the dependent and independent variables. The application of a quantitative analysis enabled the researcher to generalize the findings and also made comparisons between two variables. The level of significance was accepted at $p<0.05$. Quantitative data were presented in the form of frequency tables, pie charts and bar charts. The analysis of data, therefore, looks at set objectives, implementation structures, and consensus. The Household Food Insecurity Access Scale (HFIAS) where respondents were assessed whether they have experienced the phenomenon: 1=Rarely (once or twice); 2=Sometimes (3 to 10 times); 3=Often (more than 10 times) was used with a recall period of thirty (30) days. The response to each question was coded and the sum of these responses was analysed. For the income variable, respondents in the three selected communities were asked of their annual farm and non-farm incomes from 2014 to 2018. Anova was therefore used to analyse if there is a statistical the differences among the incomes of household heads in the three communities.

Social amenities, peaceful environment, social vices, state of roads and diseases/health effects.

4.7.2 Qualitative Analysis

The qualitative data gathered through the FGDs and key informant interviews were transcribed verbatim from audio to text format. The audiotapes were then transferred and saved as a backup. The data were analysed using thematic analysis to ensure a deeper understanding of the issues under consideration. In the process, the data was coded, reduced to size, identified themes from the text segments, constructed the networks, assembled and grouped into similar and coherent groups. Thematic analysis moves beyond counting explicit words or phrases and focuses on identifying and describing both implicit and explicit ideas (Marks &Yardley, 2004). More so, direct quotes from the participants were integrated into the discussion to express the viewpoints and emotions of respondents.

The summary of the methodology is represented in Table 4.

Table 4: Summary of Research Design

Research Objective	Research Design	Data Sources	Data Collection Strategy	The Key Stakeholders	Method of Analysis of Data
Investigate the perception among residents in the selected communities on the effects of large-scale gold mining on their social wellbeing	Mixed-method	Primary Data	Household Survey (interviews), Focus Group Discussion and Key	Indigenes in the communities	Thematic Analysis and Descriptive Statistics

			Informant Interviews		
Analyse the differences in economic outcomes of large scale mining among host, resettled and non-mining communities	Mixed-method	Primary Data	Household Survey (interviews) Focus Group Discussion and Key Informant Interviews	Indigenes in the communities	Descriptive Statistics and Thematic Analysis
Examine the institutional support systems available and local adaptation strategies adopted by the households to minimize the negative impacts of mining on the local communities.	Qualitative	Primary Data	Focus Group Discussion and Key Informant Interviews	Indigenes in the communities,	Thematic analysis

Source: Researcher's own construct (2017)

4.8 Limitations of the study

This research had one major limitation which is the study was limited in scope as it is focused on one case study hence has limitations for wider scale generalization. It does not take into consideration the effectiveness and overall effect of the large-scale mining industry but rather examines the effects of large scale gold mining on local communities in the Upper Denkyira West District. A mix method case study would have allowed the researcher collect data from across section of the impacted population to study the issues. Lack of co-operation from some respondents posed a major problem. Some respondents were reluctant in giving out information because there has not been any improvement although some research has been done of the activities of PMGL. Another reason given for their reluctance was that the researcher was an agent from PMGL assigned to get information from them. The researcher was nearly beaten in the resettlement community due to the above perception.

Politics also posed a challenge to the researcher, hence some of the respondents were reluctant to co-operate because they assumed the study was for a political purpose, however, after a lot of convincing by showing the inductor letter and student identification card, respondents co-operated.

4.9 Ethical Consideration and Data Validation

Ethical clearance from the college of humanities was granted to peruse the study. Before the data collection, permission was sought from responsible authorities such as the traditional leaders in the study area, the mining company and health officials. An introductory letter from ISSER introduced the researcher's purpose and requests the appropriate authorities to provide the necessary information to all the institutions considered for the study. Before engaging respondents

for the household survey, FGD and key informant interviews, permission was sought for their consent before the data collection. The information was read out to individuals in a familiar language for individuals who did not understand the English language.

The use of mixed-method data collection provided a simultaneous validation for the gathered information as it comprised a triangulated approach, with quantitative and qualitative approaches employed during the study. This included in-depth interviews and FGDs, which helped in authenticating the findings of the study. According to Tracy (2010), stated that good qualitative research reflects our good behaviours in our daily lives. She emphasized that, while presenting people's voice, one should be cautious and let no other voices silence others but let all voices be heard. This was addressed by speaking with different respondents, and respondents were allowed to share their views on issues discussed, and direct quotes of some respondents have been cited for echoing the respondents' voices.

To adhere to research ethics, respondents were assured of the confidentiality of information shared with the researcher and the animosity of their identity. Pseudo names have been used for all direct quotes to uphold the confidentiality assurance given to the respondents before the data collection. During the coding and transcription of the data, some respondents were contacted to clarify responses that seemed unclear to validate and authenticate information gathered during the field survey.

4.10 Conclusion

This chapter presented the research methods applied during the data collection for the study. The chapter delved into the study design, background characteristics, target population and sampling methods employed for the study. The chapter also looked at data sources, methods of data collection, data processing and analysis, ethical consideration and limitations of the study.

CHAPTER FIVE

ECONOMIC EFFECTS OF LARGE-SCALE MINING IN THE STUDY AREA

5.1 Introduction

This chapter presents the results on the economic effects of large-scale mining. The chapter comprises the demographic characteristics of the study participants and the relative economic effects loss of farmlands, primary earnings from farming and non-farming and enhancement of economic well-being of the three communities studied. The chapter assess variables such as employment, income and food security to measure the economic effect of the activities of PMGL on the livelihoods of the three selected communities.

5.2 Demographic Characteristics of the Respondents

The section presents the demographic information about the respondents of the study. The demographic information about the respondents of this study focuses on the number of people in the communities chosen for the study, the household size, the gender distribution of the people selected as respondents, their years of staying in the community, the age distribution of the respondents, the level their education, their major economic activities and the main occupations of the respondents. This demographic information is presented in Tables 5.1, 5.2 and 5.3.

The study respondents were selected from three communities: Ayanfuri, the main mining community, Kurofofrom, the resettled community, and Nkutonsu, a nearby non-mining community. These three communities were chosen for the study. It is seen from Table 5.1 that 150 people were selected from Ayanfuri, and this represents 42.9 percent of the total respondents. One hundred respondents each were selected from Kurofofrom and Nkutonsu. The gender of respondents was examined, and it was shown that out of the 350 respondents used for the study, 56.9 percent were female, while 43.1 percent were males.

The ages of the respondents were classified into four: between 30 and 40 years: between 41 and 50 years: between 51 and 60 years; and lastly above 61 years. From Table 5.1, the majority of the respondents were between the ages of 30 to 40 years (46.9 percent), while 22 percent of the respondents were between the ages of 41 to 50 years. The results also revealed that 18 percent of the respondents were 51 to 60, while 13.1 percent were above 60 years.

The majority of the respondents had basic education (54.3 percent), followed by secondary education, which formed (23.7 percent) of the total respondents. Respondents without formal education constituted 14.3 percent, while 7.7 percent of the respondents had certificates from the tertiary institution. The number of years that the respondents have stayed in the communities were also assessed to evaluate how well their responses are based on personal experience rather than hearsay.

Table 5.1 shows that majority of the respondents had stayed in the communities for 16 years and above (74.9 percent), followed by respondents who have been in the communities for 6 to 10 (11.7 percent). The results also revealed that 7.4 percent of the respondents have stayed in the communities from 1 to 5 years, whiles respondents who had stayed in the communities from 11 to 15 years were 6 percent. The result shows that a great proportion of the respondents, thus 92.6 percent have stayed in the community for more than five years. This is an indication that the respondents have well and vested knowledge in the phenomenon being examined and that the responses are based on their personal experience and convictions rather than what someone has told them.

Table 5.1 shows that 42 percent of the respondents had 1 to 5 people in their households, 43.7 percent had 6 to 10 people in their household. Again, the results show that 9.14 percent had

household size between 11 to 15 people while 4.86 percent of the respondents indicated having between 16 to 20 household sizes.

Table 5.1: Demographic Information of the Respondents

Variables	Frequency	Percent
Community		
Ayanfuri	**150**	42.9
Kurofofrom	100	28.6
Nkutonsu	100	28.6
Total	350	100
Gender		
Female	199	56.9
Male	151	43.1
Total	350	100
Age of Respondent		
30-40 years	164	46.9
41-50 years	77	22
51-60 years	63	18
Above 60 years	46	13.1
Total	350	100
Level of Education		
None	50	14.3
Basic	190	54.3
Secondary	83	23.7
Tertiary	27	7.7
Total	350	100
Years of Stay in the Community		
1-5 Years	26	7.4
6-10 Years	41	11.7
11-15 Years	21	6
16 years and above	262	74.9
Total	350	100
Household Size		
1-5	147	42
6 – 10	153	43.7
11 – 15	32	9.14

16 – 20	17	4.86
Above 20	1	0.3

Source: Fieldwork, (2019)

5.2.1 Major Economic Activity

The economic activities of the respondents were assessed in order to ascertain the major economic activities in the three communities. Findings from Table 5.2 reveal that 56.7 percent of the total respondents of 350 were farmers, followed by trading representing 30.29 percent of the total respondents. Again, 13.43 percent of the respondent were engaged in mining.

In the active mining community, 52 percent of the respondents were farmers, 34.7% were traders whilst 13.3 percent were in the mining industry. With regards to the nearby mining community, 61 percent of them were farmers and 31 percent were traders. For the resettled community, 58 percent of the respondents were farmers and 23 percent of them were traders. Hence, the economic activities for the communities do not significantly differ from each other. This result is consistent with Opoku-Ware (2010), who explained that rural communities with arable land are primarily farmers.

Table 5.2: Community Major Economic Activity

	Community			
	Mining Community (n=150)	Resettled Community (n=100)	Nearby non-mining Community (n=100)	Total (n=350)
Farming	52.0%	61.0%	58.0%	56.3%
Trading	34.7%	31.0%	23.0%	30.3%
Mining	13.3%	8.0%	19.0%	13.4%
	Test statistics	Df	p-value	
Chi-square	8.16	4	0.086	
Likelihood ratio	8.39	4	0.078	

Source: Field Survey (2019)

5.3 ECONOMIC EFFECTS OF LARGE-SCALE MINING ON AYANFURI, NKUTONSU AND KUROFOFROM

5.3.1 Employment

Employment is one of the major determinants of the economic well-being of individuals in mining communities. Employment as an economic factor measures how the people of a community or in a country are gainfully involved in a source of income activity.

From Table 5.3, it was found out that, in the active mining community, before the PMGL, more than half of the respondents were farmers (58.7%), 16.7 percent were traders, 15.9 percent were into small-scale mining and 5.1 percent of the respondents were unemployed. During the FGDs, it also became evident that farming and small-scale mining were the major occupations in the mining community although some individuals were into trading. A respondent had this to say;

> *"This community used to be full of farmers as we had vast land for farming, although quite a number of people were into galamsey operations. I can't speak of same now, as our farmlands have been taken over by the mines and those who were into galamsey has been stopped" (FGD respondent at the resettled community, 2019).*

This collaborates other research done by Antwi, 2010; Obeng- Odoom, 2014; Aragón and Rud, 2012; Solomon 2011 who concludes that large-scale mining takes place in areas where farming is considered the main source of livelihoods for the indigenes. However, the result in Table 5.4 indicates that in post PMGL, unemployment in Ayanfuri increased from 5.1 percent to 10.1 percent post PMGL, while the percentage of respondents who were farmers in pre PMGL reduced from

58.7 percent to 24.0 percent. People shifted from farming into trading as the percentage of the respondents who were into trading in pre PMGL increased from 16.7 percent to 41.1 percent in post PMGL, which confirms research by Aragon and Rud (2016), Berman et al. (2017) and Knutsen *et al*., (2017) who conclude that LSM activities are linked to some negative impacts such as decreased agricultural productivity and joblessness. Again, respondents who were into small-scale mining (*galamsey*) in pre PMGL decreased from 15.9 to 8.5 percent. This result was explained during the FGDs as it was explained that due to PMGL, huge farmlands have been affected hence most victims have ventured into trading. Also, the reduction in galamsey was due to the ban on *galamsey* and the takeover of mining sites by PMGL. A respondent had this to say;

"Some of us who were farmers are now into business with the cash compensation PMGL gave us while those who were into galamsey are out of jobs since PMGL does not allow them to mine. This has increased the unemployment rate in the community" (FGD respondent at mining community, 2019).

The above result is consistent with Yankson and Gough (2019), who noted in their work that, in the rural areas where large-scale mining takes place, the main occupation of residents is farming, with few people involving in the public/civil works. Table 5.3 shows that, in the resettled community, before the large-scale mining, half of the 100 respondents were farmers (50.0%) and only 27.0 percent of the respondents were traders. Again, 9.0 percent of the respondents were into small scale-mining and 9.0 percent of the respondents were unemployed. However, the result from Table 5.4 indicates that post PMGL, unemployment in the resettled increased from 9.0 percent pre-PMGL to 12.5 percent post PMGL while the percentage of respondents who were farmers

reduced from 50.0 percent to 20.8 percent post PMGL. People shifted from farming into trading as the percentage of the respondents who were into trading pre-PMGL increased from 27.0 percent to 46.9 percent post PMGL. Again, respondents who were into small-scale mining (*galamsey*) pre PMGL reduced from 9.0 percent to 4.2 percent post-PMGL. Also, the respondents who worked with a large-scale mining company pre-PMGL increased from 2.0 percent to 10.4 percent post-PMGL. Loss of farmlands was attributed to the shift from farming to trading. This confirms research by Opoku-Ware 2010, who explained that when people are compensated for the loss of their farmlands as a result of large-scale mining, they tend to invest the compensation monies into trading. Respondents in the mining and resettled communities explained that the reduction in galamsey was due to the ban on *galamsey* and the takeover of mining sites by PMGL. Respondent also admitted that the number of people who used to work in LSM have increased since the arrival of PMGL, although they expressed the views that mining companies can do better by employing more people from the community. A respondent had this to say:

> *"Here at Kurofofrom, most residents have ventured into trading in goods and services as there is limited lands for farming and unemployment has increased as most of the youths are no more into galamsey" (FGD respondent at the resettled community, 2019).*

The chi-square test and the likelihood ratio test all show there is a significant association between the communities and the occupation before the large-scale mining. This means that the changes in the percentage of respondents in each occupation category were closely related with percentages of respondents in each of the community who were found in similar occupation.

Table 5.3: Employment pattern before mining

	Before PMGL			
	Mining Community (n=138)	Resettled Community (n=100)	Nearby non-mining Community (n=92)	Total (n=330)
Unemployed	5.1%	9.0%	14.1%	8.8%
Farmer	58.7%	50.0%	18.5%	44.8%
Trader	16.7%	27.0%	25.0%	22.1%
Public/Civil Servant	0.0%	3.0%	7.6%	3.0%
Large Scale Mining	1.4%	2.0%	1.1%	1.5%
Small Scale Mining	15.9%	9.0%	17.4%	14.2%
Others	2.2%	0.0%	16.3%	5.5%
	Test statistics	Df	p-value	
Chi-square	70.89	12	0.00	
Likelihood ratio	76.28	12	0.00	

Source: Field Survey (2019)

At the nearby non-mining community, results from table 5.3 shows that pre PMGL, 18.5 percent of the 100 respondents interviewed stated they were into farming while 25 percent were into trading. Again, 17.4 percent of the respondents were into small scale mining pre PMGL while 14.1 percent were unemployed. However, the results in Table 5.4 indicates that post PMGL, unemployment reduced from 14.1 percent to 9.4 percent post PMGL while the percentage of respondents who were farmers pre-PMGL increased from 18.5 percent 20.0 percent post-PMGL. The percentage of respondents who were into trading pre-PMGL increased from 25.0 percent to 29.4 percent post PMGL. Again, the respondents who were into small-scale mining (*galamsey*) pre PMGL reduced from 17.4 percent to 3.5 percent post PMGL. The respondents from the FGDs indicated that the community has a large size of land for farming purposes. This is because farmlands in the nearby non-mining community were not affected by PMGL. Respondents expressed that the unemployment rate has reduced since PMGL has employed people from the

community. It was also stated by respondents that economic activities in the community was booming since a lot of people have migrated to the community.

Table 5.4: Employment pattern After PMGL

	Community			
	Mining Community (n=129)	Resettled Community (n=96)	Nearby Non-Mining Community (n=85)	Total (n=310)
Unemployed	10.1%	12.5%	9.4%	10.6%
Farmer	24.0%	20.8%	20.0%	21.9%
Trader	41.1%	46.9%	29.4%	39.7%
Public/Civil Servant	1.6%	3.1%	12.9%	5.2%
Large Scale Mining	10.1%	10.4%	0.0%	7.4%
Small Scale Mining	8.5%	4.2%	3.5%	5.8%
Others	4.7%	2.1%	24.7%	9.4%
	Test statistics	df	p-value	
Chi-square	59.94	12	0.00	
Likelihood ratio	61.00	12	0.00	

Source: Field Survey (2019)

5.3.2.1 Loss of farmland and reduction in farmland size

The study did examine issues related to the loss of farmlands. Table 5.5 shows that out of the 350 respondents in the household survey, 122 respondents reported that they lost their farmlands to the mining activities. The active mining community had 60.9 percent of the respondents stated they lost their farmlands to PMGL while 39.1 percent stated their farmlands were not affected by the activities of PMGL. This collaborates with research by Aragon and Rud, (2013) who noted in their work that LSM takes farmlands of households in host communities that meant for farming purposes.

At the resettled community, 45.3 percent of the respondents stated of losing their farmlands while 54.7 percent did not lose farmlands to PMGL. However, none of the 100 respondents at the nearby non-mining community lost their farmlands to PMGL. The results of Chi-square, Likelihood ratio, and Fisher exact show that the percentage of farmlands lost significantly differs in the two communities[$(\chi^2(1) = 5.40;\ p = 0.020), (LR = 5.41; p = 0.20), (\text{Fisher exact p} = 0.000)$]. In the nearby non-mining community, none of the one hundred and fifty (150) respondent interviewed lost their farmlands to PMGL.

Table 5.5: Loss of farmlands

Communities

Loss of farmland	Mining Community (n=128)	Resettled Community (n=95))	Total (n=223)
No	39.1%	54.7%	45.7%
Yes	60.9%	45.3%	54.3%
	Test statistics	Df	p-value
Chi-square	5.40	1	0.020
Likelihood ratio(LR)	5.41	1	0.020
Fisher exact			0.022

Source: Field Survey (2019)

From Table 5.6, reduction in farm size was examined, and it was found that on average, an individual in the mining community lost 6.36 plots, and in the resettled community an individual lost 8.26 plots of lands. From the independent t-test, it was revealed that on average, there is no significant difference between lands lost per person in the mining and resettled communities $(t(119) = -1.542; p = 0.126)$.

Table 5.6: Quantity of farmlands lost

	N	Mean	Std. Deviation	df	Test	p-value
Mining Community	78	6.36	4.701		-1.542	0.126
Resettled Community	43	8.26	8.845	119		
Total	121	7.03	6.511			

Source: Field Survey, (2019)

5.3.2 Compensation for loss of farmlands

The respondents who lost their farmlands indicated that they were compensated for their farmlands, however, not all the respondents were compensated. Out of the 123 people who lost their farmlands, 113 (91.9%) respondents indicated that they were compensated, while 10 (8.1%) stated that they have not been compensated. At the mining community, 89.9 percent of the respondents were compensated while 10.10 percent stated that they were not compensated. At the resettled community, 95.5 percent of households who lost farmlands were compensated while 4.50 indicated they were not compensated for their lands. Respondents in the FGDs stated that the reason for non-payment of compensations was disagreement on the valuation of lands and rate of payment. A respondent had this to say:

> *"A committee was set up which included our traditional leaders, the mining company and officials from government institutions such as minerals commission, environmental protection agency and lands commission. I think a private evaluator was brought on board to do the evaluation. What went wrong is our traditional leaders did not seek our interest so as to have a good bidding. It is alleged that they were bribed by the mining company" (FGD respondent at the mining community, 2019).*

There is no significant difference in the number of compensated people in the two communities. According to Kapstein and Kim (2011), compensation is always given to people who are genuinely landowners when government or company needs their land, hence not everyone is to be compensated.

Table 5.7: Compensation for farmland loss

	Community		
Compensation for farmland	Mining Community (n=79)	Resettled Community (n=44)	Total (n=123)
No	10.10%	4.50%	8.10%
Yes	89.90%	95.50%	91.90%
	Test statistics	df	p-value
Chi-square	1.179	1	0.278
Likelihood ratio	1.283	1	0.257
Fisher's Exact Test			0.493

Source: Field Survey, (2019)

5.3.3 Level of satisfaction with compensation

Respondents who lost their farmlands were asked to indicate if they were satisfied with the compensation packages given to them by PMGL. In the mining community, out of the 74 respondents who reported losing farmlands, 66.2 percent indicated that they were extremely dissatisfied with compensation, 13.5 percent were dissatisfied while 10.8 percent stated they were moderately satisfied and 5.5 were satisfied. However, 4.1 percent of the respondents were compensated one way or the other indicated that they were very satisfied with compensations received from the mining company. Reasons for dissatisfaction expressed during the FGDs were lack of alternative livelihoods, low valuation rate and non-involvement in the valuation processes. Probing why others are satisfied, the respondents explained that those who were satisfied probably

did not know how valuable their lands were, hence were happy with the little money given them. A respondent had this to say:

> *"The valuation rate they gave us was low compared to nearby mining communities. This happened because we were taken out of the entire valuation process. Again, the mining company should have at least secure farmlands from nearby communities for us, giving us money was not enough" (FGD respondent at the mining community, 2019)*

However, some of the respondents for the FGDs expressed deep satisfaction and were full of praises for PMGL. A respondent had this to say:

> *"The money they gave me was good, it would have taken me some years to get such money, I have bought two taxis from it and have given one to someone to drive while I work with the other; I am using the sales I make to cater for my family while I invest sales from the other taxi in building a house for rentals" (FGD respondent at the mining community, 2019).*

In response to the above, an officer from PMGL said the land evaluation division was the entity responsible in determining the compensation rate and not PMGL therefore all complaints on compensations should be channelled to Land Evaluation Division (LDV).

In the resettled community, out of the 41 respondents who reported losing farmlands, 31.7 percent indicated that they were extremely dissatisfied with compensation, 41.5 percent were dissatisfied while 19.5 percent stated they were moderately satisfied and 7.3 percent were satisfied. None of the respondents indicated they were very satisfied with the compensation given. Most of these respondents had lost lands and buildings and have been compensated as such. Reasons given by respondents during the FGDs for their dissatisfaction were low valuation rate and lack of

alternative livelihoods. Mainly, the respondents agreed that PMGL should have secured farmlands from nearby communities so that those who still had an interest in farming could continue to do so. Respondents were also disappointed that the PMGL did not educate or offer them any financial advice on how compensation monies could be invested into profitable ventures. A respondent remarked as follows:

> *"Personally, I have been farming for a long time so that is where my experience is, giving me money for losing my farmlands has done more harm than good. Though I received cash compensation, I would have preferred the provision of alternative farmlands from nearby communities to continue farming" (FGD respondent at the resettled community, 2019).*

Some respondents who said they were satisfied either have been successful in investing the compensation money cautiously or have been compensated with cash for land and a new house for losing their houses. This result consistent with Mensah and Okyere (2014), who noted that most people who lose their farmlands as a result LSM are not well compensated. The chi-square test and the likelihood ratio both suggested a significant difference in the level of satisfaction between the mining and resettled communities.

Table 5.8: Level of Satisfaction with compensation payment

	Community		
Satisfaction of compensation	Mining Community (n=74)	Resettled Community (n=41)	Total (n=115)
Extremely Dissatisfied	66.2%	31.7%	53.9%
Dissatisfied	13.5%	41.5%	23.5%
Moderately satisfied	10.8%	19.5%	13.9%

Satisfied	5.4%	7.3%	6.1%
Very satisfied	4.1%	0.0%	2.6%
	Test statistics	df	p-value
Chi-square	17.86	4.00	0.001
Likelihood ratio	18.81	4.00	0.001

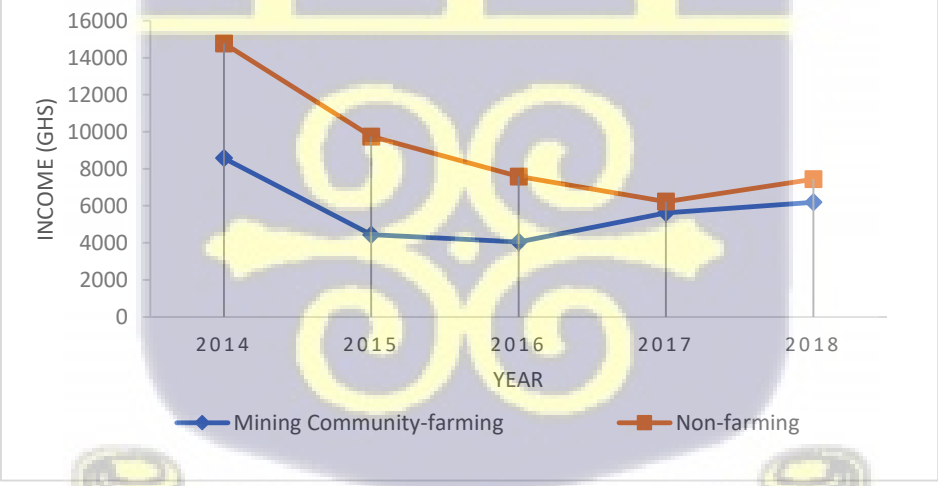
Source: Field Survey (2019)

5.3.4 Income

Income is one of the major variables that is considered in measuring the well-being of people. This study, from Figure 5.1 (Panel A, B and C) indicates that non-farm income was higher in all three communities compared to farm income over the years under review. This could suggest that non-farm income sources were a key driver of households' total income.

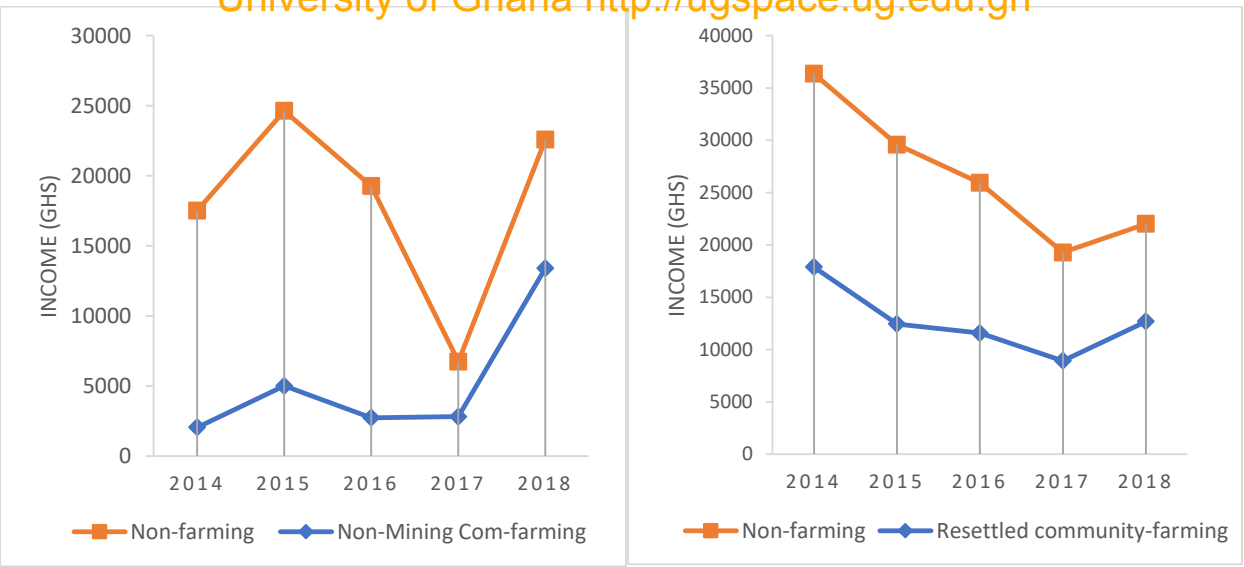
Figure 5.1: Average annual income of household heads in the communities

Panel A-Income growth for the mining community



Panel B-Non-mining community

Panel C **-Resettled community**



Source: Field Survey (2019)

It was further found that non-farm and farm income for both mining and resettled communities fell over the years but began to rise after 2017. This could be attributed to the loss of livelihoods and halts in small-scale mining (galamsey) since 24.9 percent of the 250 respondents in both mining and resettled communities stated that they were in galamsey operation on lands that formed part of the concession of PMGL. However, between 2017 and 2018, respondents whose households were affected reported receipt of compensation, which could partially account for the rise in incomes. More so, after 3 years of operation, it is expected that any negative economic effect on communities would have stabilised and economic activities increased after destabilisation in the early years of the operation of the mines. It can further be inferred that with time, as people adapt to coping strategies and interventions, incomes may rise in the subsequent years. However, in the nearby non-mining community, income for both farming and non-farming fluctuated over the period but also began to behave similarly to the other communities after 2017. This was as a result of loss of livelihoods and halts in small-scale mining since some of the respondents were involved in *galamssey* on lands which formed part of the concession of PMGL.

ANOVA was used to test significance of the differences in mean of incomes of household heads in the three communities. The results are presented in table 5.9 and 5.10. Table 5.9

presents the mean incomes of the three communities whilst 5.10 presents the results of the ANOVA test.

Table 5.9: Average annual income of household heads in the communities

Communities	2014	2015	2016	2017	2018
Ayanfuri-farming income	8582.3	4438.3	4048.2	5623.7	6194.5
Ayanfuri Non-farming income	14775.8	9745.8	7585.5	6227.9	7441.7
Kurofofrom farming income	17897.2	12442.6	11574.7	8928.1	12694.4
Kurofofrom non-farming	18471.1	17150.7	14361.7	10348.5	9319.2
Nkuntonsu non-farming income	2054.4	5018.2	2741.5	2817.9	13411.9
Nkuntonsu non-farming income	15474.6	19623.2	16531.6	3927.3	9183.3

Source: Field Survey (2019)

The results in Table 5.9 indicate that the average household farm and non-farm income of the mining community were higher than the nearby non-mining community in 2014 before PMGL's operation in the mining community. During the FGDs, respondents revealed that although there have been two large-scale mining companies in the community before PMGL, their farmlands were not affected by their activities. This explains why in 2014, the mining community recorded higher farm income despite activities of large-scale mining in the community. They also expressed that economic activities in the community boomed when the previous mining companies were in operation in the community, which accounted for the high income from non-farm activities by the respondents. This collaborates with other research done by McPhail, 2009, Tei Mensah, *et al*., 2017 and Tolonen, 2015 who concludes that host communities are likely to have booming economic activities and social benefits compared to nearby non-mining communities. One of the respondents of FGDs had this to say;

> *"This community was very busy and active when the previous two mines were here, they didn't stop us from galamsey as this current mine has. There was money in the system, farming, trading and galamsey were vibrant here. Those mines treated us*

very well compared to this current mine" (FGD Respondent at the mining community, 2019).

In 2015, the non-farm income of the resettled community was higher than the mining community. It was revealed during the FGDs at the resettled community that the efforts from the community support group made it possible for households to be given soft loans in 2015 by a micro-finance institution at Dunkwa-On-Offin. According to respondents the loan helped them to set up businesses to support themselves against the negative effects the displacement. A respondent had this to say;

"We were lucky as our leaders secured loans for us to help us manage the displacement the mining company has cost. For me, I had Ghs 10,000 which I bought a car to be used for a taxi. It really helped me and I have finished paying for the loan. This was made possible by our community support group and not by the mine" (FGD Respondent at the resettled community, 2019).

The above might have accounted for the increase in non-farm income of households in the resettlement community. The average farm income of household heads in the resettled community was also higher than the mining community and significant at 5%. This is because more than 50% of the respondents interviewed in that community did not lose their farmlands but rather their houses, hence most were still farming on their farmlands. This could be the reason why in the resettled community, farm income was higher despite the presence of the mine. The average farm income of respondents in the nearby non-mining community was greater than the mining community. This was expected as in 2015 PMGL had commenced their mining activities, hence, farmlands were lost which might have reduced income earned from farming

Also, the Table 5.10 indicates that the average household non-farm income of the nearby non-mining community was again higher than the mining community and significant at 5%. FGDs with respondents at the nearby non-mining community revealed that economic activities started booming in the community when PMGL arrived in Ayanfuri in 2015. This is because a lot of people have migrated to the community including workers at PMGL due to the unrest situation from the unset of the operations of PMGL between the community and the mines. This might account for the high non-farm income recorded in the non-mining community.

Results in Table 5.10 also indicate the average farm income of household heads in the resettled community was also higher than the mining and significant at 5%. As indicated above, some respondents in the resettled community were still farming since their farmlands were not affected. It was expressed during the FGDs that due to the loss of farmlands to PMGL, farm produce began to be scarce hence the demand for farm produce was high which led to a hike in prices. The fortunate ones who were still farming benefited from the sale of their farm produce which increased their farm income. A respondent had this to say;

> *"As soon as the mine took over farmlands, foodstuff began to drop and prices went up. We the fortunate ones who still had our farms made a lot more money from the sale of our farm produce" (FGD Respondent at the resettled community, 2019).*

Also, the non-farm income of the resettled community was higher than that of the mining community. This could be due to an increase in prices of foodstuffs since there was a shortage of foodstuffs in the mining community due to the loss of farmlands to the mines and also the benefit of soft loans given to the community in 2015. However, the average non-farm income of household heads at the non-mining recorded higher incomes and is significant at 0.5% than the mining community. It was observed that there were high economic activities in the non-mining community

compared to the mining community. The reason attributed to this was that, there is unrest and chaos in the mining community, hence a lot of people have moved to the nearby non-mining community.

In 2017, the non-farm income of household heads in the resettled community was higher than the mining community and significant at 5%. The result indicates that in the resettled community, both farm and non-farm incomes were higher. This could be as a result of the soft loans given to households in 2015. In 2018, the average farm income of household heads in the resettled community was higher than the mining. Further analysis shows that more than 50% of the respondents for the household survey in the resettled community did not lose their farmlands that is how come the income farming was higher than the mining community. Also, the non-farm income of the resettled community was higher than that of the mining community. This could be due to an increase in prices of foodstuffs since there was a shortage of foodstuffs in the mining community due to the loss of farmlands to the mines.

Table 5.10: Income for farming and non-farming

Dependent Variable	(I) Community	(J) Community	Mean Difference (I-J) (Farm Income)	Mean Difference (I-J) (Non-farm Income)
2014	Mining Community	Non-Mining Com.	6527.822* (2707.351)	1026.897 (4504.572)
2015	Mining Community	Resettled Com.	-8004.386* (2575.834)	-7404.9 (4750.631)
		Non-Mining Com.	-579.921 (2352.422)	-9877.422* (4771.971)
2016	Mining Community	Resettled Com.	-7526.540* (1818.189)	-6776.24 (4251.582
		Non-Mining Com.	1306.727 (1696.836)	-8946.086* (4310.204
2017	Mining Community	Resettled Com.	3304.44 (1860.678)	-4120.654* (1843.812

		Non-Mining Com.	2805.75 (1748.698)	2300.592 (2445.712)
2018	Mining Community	Resettled Com.	-6500 (7295.385)	-1877.52 (1739.35)
		Non-Mining Com.	-7217.5 (6045.618)	-1741.56 (3822.228)

*The mean difference is significant at the 5% level

Source: Field Survey (2019)

5.2.5 Food Security

In general, from Table 5.11 the results show that before PMGL, 83.7 percent of the 142 individuals who responded to the question on food security in the mining community said they were food secured, while only 16.30 percent reported food insecure. However, when the same respondents were asked to assess food security after PMGL, the results in Table 5.12 show that 29.6 percent of the respondents said there was no food insecurity issue post-PMGL, while 70.4 percent indicated that there was food insecurity in the community. It was expressed during the FGDs that foodstuffs were in abundance at a cheaper cost before PMGL although others large-scale mining companies have come to the community before PMGL. Food insecurity was attributed to the loss of farmlands to PMGL. It was revealed that there was a reduction in the production of foodstuffs in the community since farmlands have been lost to PMGL hence an increase in prices of food. A respondent had this to say;

> *"Farm produce has never been an issue in this community; foodstuffs were in abundance and were at a cheaper cost till this current mining company came to this community. We have lost our farmlands and now foodstuffs are not in abundance as it used to be and we buy them at a higher cost compared to before" (FGD respondent at the mining community, 2019).*

This collaborates with research by Baffour-Kyei, Mensah and Owusu, (2018) who noted that that mining or extracting natural resources leads to food shortage as lands used to cultivate crops are used for mining. For the resettled community, Table 5.11 show that 95.90 percent of the 98 respondents interviewed said they had food security pre-mining while 4.10 percent said they had food insecurity problem before PMGL. However, the results in Table 5.12 indicate that 35.70 percent of the respondents said they had no food security issues post PMGL while 64.30 mentioned that the community is faced with food insecurity issues. Respondents in the FGDs at the resettled community also emphasised that they have not experienced food insecurity issues till the arrival of PMGL since food was in excess. They however, also blamed PMGL for the shortage in foodstuffs and hike in prices as productive farmlands have been taken for mining purposes. It was revealed that some of the people who lost their farmlands have ventured into other alternative livelihoods such as trading from the cash compensation received from PMGL. This collaborates with a study by Hilson, (2016) who noted that farmers in mining host communities who lose farmlands to LSM venture economic sources of livelihoods to generate income for a desirable livelihood outcome.

In the nearby non-mining community, from Table 5.11, 68.40 percent of the 98 respondents said they had food security before PMGL while 31.60 percent indicated that they experienced food insecurity pre PMGL. However, in Table 5.12, 56.10 stated that food security was not a problem while 43.90 indicated facing food insecurity in the community. Interestingly, during the FGDs, it was expressed that although the community is experiencing some form of food insecurity, it was not as a result of loss of farmlands to the mine at Ayanfuri, but rather due to hike in prices of foodstuffs. Respondent enormously stated that due to the presence of the mines, a lot of people have migrated to the community in the hop to get employed by the mine, hence the demand for commodities has gone high as well as prices of foodstuffs. A respondent had this to say;

"A lot of people have moved to this town and even workers of the mine live here. This has led to an increase in prices of things like housing and foodstuffs which didn't use to be the case in this community" (FGD respondent at the resettled community, 2019).

This is consistent with research by Aragon and Rud, 2013 who concludes that a lot of mining communities have lost farmlands to mines which further leads to a high price of agricultural produce.

The chi-square and Likelihood ratio test for both pre-PMGL and post-PMGL, shows that there is a significant difference among the communities concerning food insecurity with a p-value at 0.00.

Table 5.11: Food Insecurity Pre-PMGL

	Community			Total
	Mining Community (n=142)	Resettled Community (n=98)	Non-mining Community (n=98)	(n=338)
No	85.90%	95.90%	68.40%	83.70%
Yes	14.10%	4.10%	31.60%	16.30%
	Test statistics	Df	p-value	
Chi-square	28.16	2	0.000	
Likelihood ratio	29.06	2	0.000	

Source: Field Survey (2019)

Table 5.12: Food Insecurity Post-PMGL

	Community			
	Mining Community (n=142)	Resettled Community (n=98)	Nearby non-mining Community (n=98)	Total (n=338)
No	29.60%	35.70%	56.10%	39.10%

Yes	70.40%	64.30%	43.90%	60.90%

	Test statistics	Df	p-value
Chi-square	17.81	2	0.000
Likelihood ratio	17.65	2	0.000

Source: Field Survey (2019)

5.3.4.1 Degree of Food Insecurity Pre-PMGL and Post-PMGL

The degree of food security was assessed through the use of the Household Hunger Scale (HHS). From Table 5.13, the result shows that before PMGL, 85.9 percent of the 142 individuals who responded to the question food security in the mining community said they rarely (once or twice) in a month experienced food insecurity, 3.5 percent experienced food insecurity sometimes (3 to 10 times) in a month while 10.6 percent of the respondent indicated they experienced food security often (more than 10 times) in a month. However, when respondents were asked to rate food insecurity post PMGL, the result in table 5.14 shows that 29.6 percent indicated they rarely experienced food insecurity, 13.4 percent reported they experienced food insecurity sometimes while 57.0 percent of the respondents reported often experienced food insecurity. It was expressed during the FGDs that foodstuffs were in abundance at a cheaper cost before PMGL although others mines have come before them. Food insecurity was attributed to the loss of farmlands to the mine. It was revealed that there was a reduction in the production of foodstuffs in the community, hence an increase in the prices of food. This collaborates with research by Baffour-Kyei, Mensah and Owusu, (2018) which concludes that mining or extracting natural resources leads to food shortage as lands used to cultivate crops are used for mining.

For the resettled community from table 5.13, the result shows that before PMGL, 95.9 percent of the 98 individuals who responded to the question food security said they rarely (once or twice) in a month experienced food insecurity, 2.0 percent they experienced food insecurity sometimes (3 to 10 times) in a month while 2.0 percent of the respondent indicated they experienced food

security often (more than 10 times) in a month. However, the result in table 5.14 shows that 35.7 percent indicated they rarely experienced food insecurity post PMGL, 9.2 percent reported they experienced food insecurity sometimes while 55.1 percent of the respondents reported often experienced food insecurity.

From the result it is evident that the degree of food insecurity pre-PMGL was not intense as 95.9 percent of the respondents experienced it once or twice a month however, the intensity increased as more than half of the respondent reported experienced food insecurity often. It came to bare during the FGDs those periods were when foodstuffs were out of season. They however also attributed the intensity of food insecurity to PMGL for taking up farmlands and concluded that although two other mines have been in the city before PMGL, farmlands were not affected that much as it has with PMGL. However, an officer from the mine had this to say concerning the above allegation;

> *"Yes, we are aware some mines have come here before we came to this community. As for this mine, farmlands were the most affected, it really depends where the mineral is found and the activities on that particular area. We agree that our activities have affected a lot of farmlands, hence we have compensated them well to make up for their loss*" (KII Respondents at resettled community, 2019).

From table 5.13, the result shows that in the before PMGL, 68.4 percent of the 98 individuals who responded to the question food security in the nearby non-mining community said they rarely (once or twice) in a month experienced food insecurity, 11.2 percent experienced food insecurity sometimes (3 to 10 times) in a month while 20.4 percent of the respondent indicated they experienced food security often (more than 10 times) in a month. However, the result in table 5.14 shows that 56.1 percent indicated they rarely experienced food insecurity post PMGL, 2.0 percent reported they experienced food insecurity sometimes while 41.8 percent of the respondents

reported often experienced food insecurity. The food insecurity reported by respondents at nearby non-mining community was much not able to afford foods preferred due to high prices and not necessarily as a result of loss of farmlands. Although respondents for the FGDs expressed that people from the mining community buy foodstuffs from the community to sell, foodstuffs were not in shortage but rather due to high prices of farm produce, households had to adjust their preferences to reduce cost expenditures. This is consistent with studies by Aragon and Rud, 2015 and Singh, 2015 who concludes that LSM results in a high cost of living in host and nearby communities

The chi-square and Likelihood ratio test for both pre-PMGL and post-PMGL, shows that there is a significant difference among the communities concerning food insecurity with a p-value at 0.00.

Table 5.13: Degree of Food Insecurity Pre-PMGL

	Community			
	Mining Community (n=142)	Resettled Community (n=98)	Non-mining Community (n=98)	Total (n=338)
Rarely	85.9%	95.9%	68.4%	83.7%
Sometimes	3.5%	2.0%	11.2%	5.3%
Often	10.6%	2.0%	20.4%	10.9%
	Test statistics	df	p-value	
Chi-square	28.973	4	0.000	
Likelihood ratio	30.246	4	0.000	

Table 5.14: Degree of Food Insecurity Post-PMGL

	Community

	Mining Community (n=142)	Resettled Community (n=98)	Non-mining Community (n=98)	Total (n=338)
Rarely	29.6%	35.7%	56.1%	39.1%
Sometimes	13.4%	9.2%	2.0%	8.9%
Often	57.0%	55.1%	41.8%	52.1%
	Test statistics	df	p-value	
Chi-square	22.089	4	0.000	
Likelihood ratio	23.555	4	0.000	

5.3.6 Enhancement of Economic Well-Being

The economic well-being of persons in the study areas has been affected as a result of large-scale mining. Respondents in the three selected communities were asked "has the mine enhanced your economic well-being? Responses are presented in Table 5.15. At the mining community, 53.8 percent of the respondents indicated that the mine has extremely unenhanced their economic well-being, 34.5 percent said their economic well-being has been unenhanced, 2.5 percent of the respondents stated moderately enhanced, 5.0 percent mentioned their economic well-being has been enhanced by the mine while 4.2 percent of the respondents stated that their economic well-being has been very enhanced by the mine. The general, respondents for the FGDs expressed dissatisfaction with the current mine when it comes to employment and community development compared to other mines that have been in the community. However, some respondents who have been employed or any member of their family been employed by the mine were of the view that the mine has helped them one way or the other. A respondent had this to say;

"I must say our expectations in terms of employment development from the mines have not been met since most of the youth remain unemployed, however for me and my household the mine has been a blessing to us as two of my children have been

employed by the mine. This has indeed relieved me of financial stress since they cater for the young ones" (FGD respondent at the mining community, 2019).

The chief of the mining community also had this to say;

"Yes, I agree that the number of people employed by the mine is not much. Do I blame the mine? No, this is because most people who want to be employed by the mines have no working experience working with a mine, therefore are disqualified when they apply for employment. My subjects are strong-headed, I advised them before the current mine came to enroll in training in the mining field so that when the mine comes they would be considered but they ignored me and some even mocked me" (KII Respondent at the mining community, 2019).

In the resettled community, 23.5 percent of the respondents said their economic well-being has been extremely unenhanced, 46.9 percent indicated unenhanced, 11.2 percent pointed that the mines have moderately enhanced their economic well-being, 17.3 percent indicated the mine has enhanced their economic well-being while 1.0 percent indicated that their economic well-being has been very enhanced by the current mine. Responses from the FGDs at resettled community was not much different to what was revealed at the mining community as respondents indicated that their expectations were not met by the mine when it comes to employment and provision of alternative livelihoods, however, most respondents were satisfied with the modern houses compensated with although the displacement came with few challenges.

Also, in the nearby non-mining community, 43.5 percent of respondents indicated that the mines have extremely unenhanced their economic well-being, 55.1 percent said their economic well-being has been unenhanced, 1.4 percent of the respondents were moderately enhanced while none of the respondents stated that the mines at Ayanfuri has enhanced or very enhanced their economic

well-being. The people at the nearby non-mining community were indifferent as the activities of the mines do not directly affects their livelihoods. They, therefore, expressed that the community as a whole has not benefited much from the PMGL although about five people in the community have been employed by the mines. This confirms research by the World Bank, 2015 who investigated the socio-economic impact of mining on local communities in Africa, concludes mining communities and nearby communities benefit from direct employment by the mining companies. Comparing the three communities, the majority of the respondents in the mining community believe that mining has not enhanced their wellbeing. The likelihood ratio test shows that there is an association between mining enhancing well-being and community. This result confirms with Obiri *et al*., 2016, who states that the well-being of most people living in mining communities has not been improved by mines.

Table 5.15: Community specific on has Mining Enhanced Economic well-being?

	Community			
Mining enhanced well-being	Mining Community (n=119)	Resettled Community (n=98)	Nearby Non-Mining Community (n=69)	Total (286)
Extremely unenhanced	53.8%	23.5%	43.5%	40.9%
Unenhanced	34.5%	46.9%	55.1%	43.7%
Moderately enhanced	2.5%	11.2%	1.4%	5.2%
Enhanced	5.0%	17.3%	0.0%	8.0%
Very enhanced	4.2%	1.0%	0.0%	2.1%
	Test statistics	df	p-value	
Chi-square	49.01	8	0.000	
Likelihood ratio	53.55	8	0.000	

Source: Field Survey (2019)

5.3 Conclusion

There is a significant difference in the economic outcomes of large-scale mining on the host, resettled and non-mining communities. The activities of PMGL resulted in the loss of farmlands, where the majority of respondents in the mining community lost most farmlands compared with the resettled community. However, the size of farmlands loss is not significantly different from active mining community and resettled community. For the nearby non-mining community, there was no loss of farmlands. Compensation for loss of farmland and satisfaction of compensation was significantly different from active mining community and resettled community. Non-farm income was higher compared to farm income over the years in all three communities. However, non-farm and farm income for both mining and resettled communities fell over the years but income began to rise after 2017 in all three communities. Food insecurity was experienced across the three communities; however, the intensity of the experience differs from community to community.

CHAPTER SIX

SOCIAL EFFECTS OF THE LARGE-SCALE MINING

6.1 Introduction

The chapter presents the social effects of the activities of PMGL on Ayanfuri (active mining community), Kurofofrom (nearby non-mining community) and Nkutonsu (resettled community). The chapter discusses variables such as living conditions, state of electricity, state of water supply, job opportunities available, state of social amenities, state of the environment, rate of social vices,

condition of roads and cost of living to measure the social effects. The chapter examined these variables pre-PMGL and post-PMGL phases.

6.2 Assessment of living conditions of respondents in the mining, resettled and nearby non-mining community now and before

The assessment of living conditions in the literature is seen as one of the main measures of the social impacts as it encompasses various areas of the social aspects of people into a single component (Rath & Harter, 2010). For instance, Rath and Harter (2010) asserted that the components of social impacts of a phenomenon are; physical well-being, community well-being, and career well-being. The components of social well-being according to Tchiki (2019), focus on the elements of good health, high life satisfaction, a sense of meaning or purpose and the ability to manage the individual stress level. These components of the social well-being measure from the findings by Tchiki (2019) are expected to be fulfilled in the life of an individual. Assessment of the living conditions of the respondents before and after the arrival of the large-scale mining was explored. The results in Table 6.1 show that close to half ($n = 166; 49.1\%$) of the respondents out of the 338 believed that large-scale mining had worsened the living conditions of the people in the communities compared to before the mining companies commenced their operations.

Specifically, in the active mining community, 66.2 percent of the respondents indicated that the living conditions of the people have worsened, while 4.9 percent were of the view that there has been no change in the living condition of the inhabitants since the arrival of the PMGL. However, 1.4 percent and 13.4 percent indicated the living condition of the inhabitants is better and slightly better, respectively. The above results were confirmed during the FGD in the active mining community where many were farmers have lost their farmlands to PMGL. Again, people who used to engage in galamsey before PMGL lost their jobs to the PMGL since where they used to mine forms part of the concession of the PMGL.

Some respondents expressed the following views:

> *"Before the mines came here, I was a cocoa farmer with ten plots of land. When they came, my farmland was affected by the operations of the mines. Although I was compensated, I still have a passion for farming because that is what I have been doing for the past twenty years. The mines have really messed my life up. Even the ones which were not affected, I can't farm there for long hours due to the blasting from the mines which has affected my yields" (FGD respondent at the mining community, 2019).*

> *"I used to mine near the concession of the mines and money was not a problem for most of us youth, but since the mines came and sacked us all through the operation vanguard, our lives have been turned upside down. The mines refused to employ us, in fact our lives have been affected so much" (FGD respondent at the mining community, 2019).*

This is consistent with a study by Aragón, Chuhan-Pole and Land (2015), who noted that local communities could be affected by the activities of mining companies through income and employment. However, it contradicts a study by Cornish (2012, 2013) who found that mining operations in Botswana's Jwaneng area indeed, increased employment rates, causing an improved standard of living for locals within the community. However, some respondents also expressed their gratitude to PMGL for giving their children scholarships and employed their children. A respondent had this to say:

> *"I know few people whose children have been given scholarships by the mines to pursue their education. For me, one of my children has been employed by the mines*

and I am so happy about it because he supports his younger siblings" (FGD respondent at the mining community, 2019).

This is consistent with Antwi, (2010) and Obeng-Odoom, (2014) who noted that mining communities benefit from large-scale mining communities in the form of social amenities and social supports.

However, at the resettled community, 6.1 percent of respondents indicated their community was better off compared to before PMGL came while 15.3 percent of the respondents were of the view that the community is slightly better. Resettlement packages such as monies and modern houses account for the above responses. Interestingly, 27.6 percent and 48 percent of respondents at the resettled community also indicated that the lives of people in the community are slightly worse off and worse off respectively. Most of these respondents stated during the FGDs that monies received as compensation were invested into none lucrative business whiles others have been cheated of their investment, hence they prefer their farmlands to the monies given them since it did not yield positive results. This result confirms with Antwi (2010), who concludes that towns that have large-scale mining ongoing experience both positive and adverse living conditions such as good roads, increase in social vice and high increase in prices. Responses from the FDGs indicated revealed that the presence of PMGL has generated both positive and negative consequences in the community. The Chief of the mining community had this to say;

"Being a Chief of this land, I have seen a significant transformation in the well-being of people in this town in both the positive and negative ways, such as scholarships, employment opportunities and improved economic activities. However, some negative effects such as clashes, prostitution and some health effects have been reported" (Key Informant Interview at the mining community, 2019).

Nevertheless, at the nearby non-mining community, 17.3 percent of the 98 respondents indicated that the lives of people in the community are better off since PMGL came to Ayanfuri compared to before they did. Reasons given during the FGD were that some community members including their chief have been employed by the mines. A respondent had this to say:

> *"Although there is no significant thing this community has benefited from the PMGL at Ayanfuri, some few people in our community including our chief have been employed by the mines. I am happy for those fortunate ones" (FGD respondent at the nearby non-mining community, 2019).*

This endorses a study by Salifu, Oladejo, & Adetunde, (2013) which concludes that large-scale mining companies generate jobs for neighbouring communities via direct and indirect jobs. However, 25.5 percent of the respondents also indicated that the arrival of the mines has made the community worse off. Reasons given during the FGDs were that cost of living is high especially foodstuffs and rents. This is because people from nearby communities have migrated to their community in search of jobs whiles most workers of the mines have also relocated to their community due to agitations at the mining community. This according to them has caused a hike in prices of foodstuffs and rents for accommodation, which affects the living standard of their inhabitants.

Table 6.1: Assessment of living conditions now and before PMGL

	Community			
	Mining Community (n=142)	Resettled Community (n=98)	Nearby Non-Mining Community (n=98)	Total (n=338)
Better	1.4%	6.1%	17.3%	7.4%
Slightly better	13.4%	15.3%	5.1%	11.5%

No change	4.9%	3.1%	36.7%	13.6%
Slightly worse	14.1%	27.6%	15.3%	18.3%
Worse	66.2%	48.0%	25.5%	49.1%

	Test statistics	Df	p-value
Chi-square	105.75	8	0.000
Likelihood ratio	101.45	8	0.000

Source: Field Survey (2019)

6.3 State of Water Supply before and after PMGL

The state of water supply before and after PMGL was examined. The result from Table 6.2 indicates that at mining community, 14.1 percent of the 142 respondents who answered the question on water supply said water supply was worse before PMGL while 85.9 percent revealed that water supply was better before the arrival of PMGL. However, 82.7 percent and 17.6 percent of the same respondents indicated that the state of water supply was worse and better after mining respectively. During the FGDs, it was alleged that the mine has destroyed water bodies and even water from boreholes in the community through the disposal of seepage from tailings and waste, however, this was denied during an interview with an officer of PMGL. A respondent had this to say;

> *Streams in this village are destroyed by the mines, I don't know how they do it. Information around is that the mines dispose of their wastes into the stream. Again, water from boreholes is very salty and hard (FGD respondent at the mining community, 2019).*

According to the officer, the galamsey activities in the community have rather destroyed water bodies in the community.

In the resettled community, 10.2 percent of the 98 respondents for the household survey indicated that the state of water supply was worse while 89.8 percent of the respondents answered that water

supply was better before the arrival of the mines. However, 82 and 17 percent of respondents indicated that state of water supply was worse and better after the mines respectively. Respondents for the FGDs stated that due to chemicals from the mines, borehole water and water from streams taste salty. The responses from both mining and resettled communities on the effects of the mines of water supply is consistent with studies by Amponsah-Tawiah & Dartey-Baah (2011) and Balanay & Halog (2016) who noted that the extraction of mineral resources such as gold a major cause of environmental degradation, most especially, regarding contamination of water bodies and deforestation.

In the nearby non-mining community, 16 percent of the 100 respondents who answered the question on water supply indicated the state of water supply was worse pre-mining while 80.4 percent of the respondents answered that water supply was better before the mines at Ayanfuri. However, 80 percent and 20 percent of the respondents indicated that water supply water was worse off and better off post-mining respectively. It was interesting to note that the mine was blamed for pollution of streams and rivers.

Comparing the state of water supply before the large-scale mining among the communities, it was found out that there is no significant difference in the state of water supply among the community as the water supply was better before PMGL. For post-mining, the water supply in the communities became worse. After the arrival of the mines, the water supply became worse in all the communities, and there is no significant difference in the conditions of water supply in the three communities.

Table 6.2: State of Water Supply before and after PMGL

	State of water before mining before PMGL				State of water after mining after PMGL			
	Mining (n=142)	Resettled (n=98)	Non-mining (n=100)	Total (n=340)	Mining (n=142)	Resettled m (n=97)	Non-mining (n=100)	Total (n=33)

Worse off	14.1%	10.2%	16.0%	13.5%	82.4%	82.7%	80.0%	81.8%
Better off	85.9%	89.8%	84.0%	86.5%	17.6%	17.3%	20.0%	18.2%

	Test statistics	df	p-value	Test statistics	df	p-value
Chi-square	1.485	2	0.476	0.298	2	0.861
Likelihood ratio	1.534	2	0.464	0.295	2	0.863

Source: Field Survey (2019)

6.4 Job Opportunities before and after PMGL

Respondents were asked to share their views on the state of job opportunities before and after PMGL. The result from table 6.3 indicates that at the mining community, 4.9 percent of the 142 respondents who answered the question on job opportunities said the job opportunities were worse off pre-mining while 95.1 percent revealed that job opportunities were better off before the arrival of PMGL. However, 90.1 percent and 9.9 percent of the same respondents indicated job opportunities were worse off and better off after mining respectively. Respondent of the FGDs and key informant interviews admitted that just a few lucky ones in the community has been employed by the mines although most are temporary staff hence, they do not enjoy the full benefits as permanents staff do. A respondent had this to say;

> *"The mines have not employed me, neither are any of my children, but I cannot deny the facts that I know few people who work at the mines, but they are contract workers and not full workers. I think the mines can do better by employing more people from this community since it on our lands that they operate" (FGD respondent at the mining community, 2019).*

However, the employment rate of the mines has not met the satisfaction of the community since more people have been employed from nearby communities than the number of people employed in their communities. It was alleged that the traditional leaders take bribes from individuals from

nearby communities and present to the mines as indigenes of the mining community for employment. A respondent had this to say;

> *"How come we who leave in this community and are affected by the activities of the mines are not been employed but rather people from nearby communities? I will tell you why, our leaders make recommendations to the mines for employment by stamping application letters to indicate that we are inhabitants of the community. This is what is happening, application letters of foreigners are been stamped as if they are part of us all because they bribe our leaders. It not fair to us at all" (FGD respondent at the mining community, 2019).*

However, the interview with the Chief of the mining community denied this allegation and stated that he seeks the best interest of the community when it comes to the mines however his subjects do not listen to advice. He had this to say;

> *"Which profit-driven company will employ people without experience in their firms? Such companies do not have time to train people on the job, they rather employ people with the technical know-how to work with. Before the PMGL came to this community, I had a durbar with my subjects and informed them of the arrival of PMGL. I advised them to train themselves in readiness to be employed by the mines when they come. What did they do? They mocked me and gave me names. Am I to be blamed if the mine is not employing them due to lack of experience? They have themselves to blame. All the bribery allegations against me are false, that all I can say" (Key Informant Interview at the mining community, 2019).*

In the resettled community, 8.2 percent of the 98 respondents for the household survey indicated that job opportunities were worse off while 91.8 percent of the respondents answered that

opportunities for jobs were better off before the arrival of the mines. However, 91.8 and 8.2 percent of respondents indicated that the state of opportunities for jobs were worse off and better off after the mines respectively. The FGDs revealed that only a few people at the resettled community have been employed by the mines. It was, however, admitted that lack of skills and working experience deter them from been employed by the mines but were emphatic that they are trainable; therefore, the mines should train and employ them as other mines do. This collaborates with a study by Leshoro, (2014) in South Africa, who examined the employment elasticity of growth in Botswana and concluded that the discovery of diamonds in Botswana does not result in employment in host communities where diamonds are mined.

In the nearby non-mining community, 16 percent of the 100 respondents who answered the question on job opportunities indicated that the state of job opportunities were worse off pre-mining while 80.4 percent of the respondents answered it was better off before PMGL at Ayanfuri. However, 40 percent and 60 percent of the respondents indicated that job opportunities were worse off and better off post-mining respectively. Interestingly, respondents at the nearby non-mining community during the FGDs revealed that the mines had employed few people, although not up to ten from the community. They made mention of their chief as a worker at the mines. Some respondents had this to say:

> *"Although there is no significant thing this community has benefited from the mines at Ayanfuri, the mines have employed some five or six people in our community, including our chief. I am happy for those fortunate ones" (FGD respondent at the nearby non-mining community, 2019).*

Table 6.3: Job opportunities before and after PMGL

	Job opportunities before mining				Job opportunities after mining			
	Mining Community (n=142)	Resettled Community (n=98)	Nearby Non-Mining Community (n=100)	Total (n=340)	Mining Community (n=142)	Resettled Community (n=97)	Nearby Non-Mining Community (n=100)	Total (n=339)
Worse off	4.9%	8.2%	16.0%	9.1%	90.1%	91.8%	40.0%	75.9%
Better off	95.1%	91.8%	84.0%	90.9%	9.9%	8.2%	60.0%	24.1%

	Test statistics	df	p-value	Test statistics	df	p-value
Chi-square	8.83	2	0.012	99.759	2	0.000
Likelihood ratio	8.432	2	0.015	94.193	2	0.000

Source: Field Survey (2019)

6.5 State of Social Amenities before and after PMGL

Respondents were asked to assess the state of social amenities before and after the large-scale mining. The result from Table 6.4 below indicates that at the mining community, 52.1 percent of the 142 respondents interviewed said the state of social amenities were worse off pre-mining while 47.9 percent revealed that social amenities in the community were better off before the current mines. However, 75.4 percent and 24.6 percent indicated that the state of social amenities was worse off and better off after mining respectively. This was explained during the FGD as respondents asserted the fact that although the mine has renovated few schools, a library and an ICT center, the previous mining company before the arrival of peruses Mining Company did far better than they have done. Some also revealed that the new schools built were as a result of the old schools being affected by the operations of the mines. Most respondents of the FGD at Ayanfuri were remorseful of their disappointment with the mines for not developing their community as expected. Some respondents had this to say:

"We expected so much from this current mining company, but they have disappointed us. I am not saying they have not done anything in this community, but they have done more considering the benefits they derive from our community" they have built an ICT facility for our children though (FGD respondent at the mining community, 2019).

"The mining company expanded the existing basic school in Ayanfuri but did not build a new school in the community, however, the mines built this school for vocational and technical training" (FGD respondent at mining community, 2019).

This confirms other works done by McPhail, 2009, Obeng- Odoom, 2014, Tei Mensah, et al., 2017 and Tolonen, 2015 who concludes that host communities where large-scale mining operations take place are more likely to have access to infrastructural development compared to near-by non-mining communities.

The result was not much different at the resettled community, as 27.6 percent of respondents for the household survey indicated the state of social amenities were worse off while 72.4 percent of the respondent answered that social amenities were better off before the mines. However, 76.3 and 23.7 percent of respondents indicated that the state of social amenities was worse off and better off after the mines respectively. Again, during the FGD, respondents at the resettled community although were happy for new modern houses built for them by the mines as a form of compensation, they lamented of lack of social amenities such as public toilets, marketplace, functional police station and community center which they had at their old resident. Respondent revealed that they had made so many pleas to the mines to provide such amenities to them but their pleas have been ignored by the mines. A respondent had this to say:

"How can you build new houses for us and fails to provide us security by building police station, place of convenience for our visitors and a market center for us. When it comes to economic activities, nothing happens here, we still go to our formal place for economic transactions. The mine has turned deaf ears to our pleas to provide us with the mentioned amenities" (FGD respondent at the resettled community, 2019).

In the nearby non-mining community, 49 percent of the respondents for the household survey indicated the state of social amenities were worse off pre-mining while 51 percent of the respondent answered that social amenities were better off before the mine at Ayanfuri. However, 43 percent and 57 percent of the respondents indicated that the state of social amenities was worse off and better off post-mining respectively. The results show that there has been an improvement of social amenities in the nearby non-mining community. However, during the FGDs, respondents were quick to indicate that the improvement was not as a result of the mine at Ayanfuri, but rather from the good administration of their DCE and traditional leaders. A respondent had this to say:

"Ooh, the mines at Ayanfuri has not done anything to improve our community, our DCE and traditional leaders have done good work for the past years to provide us with the basic social amenities we need in this community. As for the mines, I don't even want to talk about them" (FGD respondent at the nearby non-mining community, 2019).

The chi-square test and likelihood ratio show that social amenities differ in the community, with p-values of the chi-square and the likelihood test shows that the state of social amenities has a significant association with the communities pre-mining and post-mining.

Table 6.4: State of social amenities before and after PMGL

	social amenities before mining				social amenities after mining			
	Mining Community (n=142)	Resettled Community (n=98)	Nearby Non-Mining Community (n=100)	Total (n=340)	Mining Community (n=142)	Resettled Community (n=97)	Nearby Non-Mining Community (n=100)	Total (n=339)
Worse off	52.1%	27.6%	49.0%	44.1%	75.4%	76.3%	43.0%	66.1%
Better off	47.9%	72.4%	51.0%	55.9%	24.6%	23.7%	57.0%	33.9%
	Test statistics	df	p-value		Test statistics	df	p-value	
Chi-square	15.558	2	0.000		33.720	2	0.000	
Likelihood ratio	16.056	2	0.000		32.759	2	0.000	

Source: Field Survey (2019)

6.6 Peaceful Environment before and after PMGL

Respondents for the household survey were asked to assess the state of "peaceful environment" pre-mining and post-mining of Perseus Mining Ghana Limited (PMGL). The results from Table 6.5 below indicate that, at the mining community, 11.3 percent of the 142 respondents interviewed revealed that before PMGL came to Ayanfuri, the community was worse off in terms of peace while 88.7 percent indicated that the community was peaceful before the arrival of PMGL. However, 93.7 percent and 6.3 percent indicated that the environment was worse off and better off post-mining respectively. Respondents during the FGD, respondents affirmed this result and revealed that since the arrival of PMGL in the community, there have been lots of robberies, agitations and clashes between inhabitants and workers of PMGL. They went on to say that, although few agitations and demonstrations had taken place before the arrival of the current mines,

the situation has worsened since PMGL started its operations. From observation, it was clear that respondents were not happy with PMGL.

The results were not much different at the resettled community, as 10.2 percent of the 98 respondents indicated the environment was worse off in terms of peace pre-mining while 89.8 percent of the respondents answered that the environment was peaceful, that is better off pre-mining. However, 94.8 and 5.2 percent of respondents indicated that the state of peaceful environment was worse off and better off respectively post-mining. Again, during the FGD, respondents in the resettled community also indicated frequent happenings of conflicts, agitations and clashes between the inhabitants and the workers of PMGL. Reasons attributed to violence were unsatisfied compensation packages, encroachment on the concession of PMGL and lack of employment. *A* respondent had this to say:

> "*Mostly, such violence or conflicts happens between the youths of this community and the mines. PMGL complains of the youths encroaching on their concession, they, therefore, attacks the youth through operation vanguard. This has resulted in some death. If the mines fail to employ the youths, what do they expect them to do?" (Respondent at FGD at the resettled community, 2019).*

In the near-by non-mining community, 15.0 percent of respondents for the household survey indicated that in terms of peaceful environment, their community was worse off while 85.0 percent were of the view the community was better off, that is the community peaceful before the arrival of PMGL at Ayanfuri. However, 28.0 percent and 72.0 percent of the respondents indicated that the state of peaceful environment was worse off and better off respectively. The results show there has been a reduction of peace in the community after the mines compared to pre-mining. Respondents for the FGDs revealed that since the mines came, a lot of people from nearby

communities have migrated to the nearby non-mining communities since accommodation is cheaper compared to the mining community. Respondent, therefore, blamed the migrant for thefts. This confirms research by Obeng-Odoom, 2014 who stated that mining leads to internal migration in mining and nearby non-mining communities as people search for job opportunities.

From the Chi-square test and likelihood, the response to a peaceful environment before mining does not differ significantly from the communities as p-value > 0.05. For post-mining, a peaceful environment, the three communities significantly differ from each other, with the p-value of the chi-square and likelihood test less than 0.05.

Table 6.5: Peaceful environment before and after PMGL

	Peaceful environment before mining				Peaceful environment after mining			
	Mining Community	Resettled Community	Non-Mining	Total	Mining Community	Resettled Community	Non-Mining	Total
	(n=142)	(n=98)	(n=100)	(n=340)	(n=142)	(n=97)	(n=100)	(n=339
Worse off	11.3%	10.2%	15.0%	12.1%	93.7%	94.8%	28.0%	74.6%
Better off	88.7%	89.8%	85.0%	87.9%	6.3%	5.2%	72.0%	25.4%
	Test statistics	df	p-value		Test statistics	df	p-value	
Chi-square	1.217[a]	2	0.544		162.948[a]	2	0.000	
Likelihood ratio	1.183	2	0.553		158.932	2	0.000	

Source: Field Survey (2019)

6.7 Social Vices before and after PMGL

Respondents for the household survey were asked to assess the state of "social vices" pre PMGL and after PMGL in Ayanfuri. The result from table 6.6 below indicates that at the mining community, 5.6 percent of the 142 respondents who responded to this question indicated that

before the arrival of PMGL, social vices were worse off while 94.4 percent of the respondents were of the view that social vices were better off before PMGL. However, 88.7 and 11.3 percent of the respondents stated that social vices are worse off and better off post-PMGL respectively. According to both FDGs and Key Informants interviews, participants agreed that the level of social vices such as alcohol abuse and prostitution in the community has increased. Reasons attributed to the increase in alcohol consumption in the mining community was that since the youths are unemployed due to loss of jobs especially galamsey workers, they have resulted in drinking. Some respondents had this to say:

> *"Prostitution is also on the rise here as a lot of foreigners have migrated to this community. I can even show you where they all live. Every effort made by the community to drive them away has been unsuccessful" (FGD respondent at the mining community, 2019).*

> *"As a chief of this community, I must say that consumption of alcohol has increased tremendously since the illegal miners were sacked to give way to the large scale mines since where they used to mine forms part of the concession of the mines. You know the devil finds work for the idle man. Robbery and prostitution have also increased" (Key Informant Interview at the mining community, 2019).*

It was also revealed during the FGD that the presence of PMGL has resulted in internal migration, which has led to an increase in prostitution in the community. Respondent exposed that these prostitutes have been housed in one place by a citizen in the community who benefits from the money they make when their services are patronage. This confirms studies by Cohen, 2014; Eldoret and Chancery, 2013; Opoku-Ware, 2014; Sinyangwe, 2012), who stated that mining in a

community leads to increased sex workers and promiscuous lifestyle in hosts and nearby communities.

In the resettled community, 9.2 percent of the 98 people who responded to the question on social vices were of the view that social vices were worse off before PMGL while 90.8 percent indicated that social vices were better off before PMGL. However, 89.7 and 10.3 percent of the respondents indicated that social vices were worse off and better off respectively after PMGL in the community. During the FGD, respondents lamented on the increase of robbery and alcohol abuse by mostly the youths in their community. They also ascribed to the fact that these youths are out of jobs (galamsey) and have not been employed by the mines hence their indecent behaviours. However, respondents declared they are not aware of the presence of prostitutes in the community.

In the nearby non-mining community, 16.0 percent of the 100 respondents for the household survey indicated that the state of social vices was worse off before the arrival of PMLG Ayanfuri while 84.0 percent of the respondent answered that the social vices was better off before PMGL arrived. However, 34 percent and 66 percent of the respondents indicated that state of social vices were worse off and better off respectively after the arrival of the mine at Ayanfuri. The results show that social vices in the nearby non-mining community have increased. This was explained during the FGDs, participants said a lot of people has migrated to the community in search of a job from the mines at the mining community therefore concluded that they are the cause of social vices such as robbery and prostitution since that was not the situation before the arrival of PMGL at Ayanfuri. However, respondents revealed that the traditional leaders have successfully driven them away from the community. Some participants of FGDs had this to say:

"There has been an increase in the number of theft cases in our community which was previously not the case. There are many prostitutes here, I mean a lot, we did

not use to have them here, but as soon as the mines came to Ayanfuri, they emerged (FGD respondent at the nearby non-mining community, 2019).

The prostitutes here are many and is as a result of the mines at Ayanfuri. Our traditional leaders have tried so many times to drive them away but have not succeeded since they keep coming back (FGD respondent the nearby non-mining community, 2019).

Table 6.6: Social Vices before and after Mining

	Social Vices before mining				Social Vices after mining			
	Mining Community (n=142)	Resettled Community (n=98)	Nearby Non-Mining Community (n=100)	Total (n=340)	Mining Comm (n=142)	Resettled Community (n=97)	Nearby Non-Mining Community (n=100)	Total (n=339)
Worse off	5.6%	9.2%	16.0%	9.7%	88.7%	89.7%	34.0%	72.9%
Better off	94.4%	90.8%	84.0%	90.3%	11.3%	10.3%	66.0%	27.1%
	Test statistics	df	p-value		Test statistics	df	p-value	
Chi-square	7.238	2	0.027		108.358	2	0.000	
Likelihood ratio	7.006	2	0.030		103.811	2	0.000	

Source: Field Survey (2019)

6.8 State of Roads before and after mining

The state of roads before and after PMGL was examined among the various community. The result in table 6.7 shows that 52.8 percent of the 142 respondents at the mining community said the state of roads before the large-scale mining was worse off while 47.2 indicated that the roads was better

off before the coming of the mines. However, 90.1 and 9.9 percent of respondents indicated that state of roads were worse off and better off post PMGL respectively. During the FGDs, a respondent explained that heavy tracks of PMGL has destroyed the roads by creating lots of potholes yet the mines have refused to do anything about it despite their pleas to reconstruct their roads. A respondent had this to say;

> *"The operations of large-scale mining companies cause the roads in the mining communities to spoil due to the heavy traffic and heavy-duty vehicles and machinery that are transported through the roads to the mining sites. Every five minutes you will see their big trucks on our roads" (FGD respondent at the mining community, 2019).*

However, key informants' interview with an official from the mines admitted that the heavy tracks of the mines could have contributed to the bad roads. The officer expressed that the mining company in contact with the Ministry of Roads wanted to reconstruct the roads but was told is the responsibility of the government to construct roads. According to the interviewee, they were asked to donate to the Ministry of roads so they award the contract for the roads to be done which the mines refused. From observation during the data collection period, the roads seemed to be under construction with lots of dust that one has to cover his/her nose when using the road. Indigenes were seen covering their noses and mouths when using on the road. He had this to say;

> *"We were more than willing to construct the roads, but not given the chance to do it our way. However, the government seems to be constructing the roads but has taken forever" (Key Informant Interview, at PMGL, 2019).*

In the resettled community), 33.7percent of the 98 people who responded to the question on the state of roads were of the view that roads were worse off before the mines came while 66.3 percent

indicated that roads were better off before the arrival of PMGL. However, 78.4 and 21.6 percent of the respondents indicated that roads were worse off and better off respectively after the arrival of PMGL. From observation, the road at the resettled community was in very good condition, however, the result of the household survey indicates otherwise. During the FGD, respondents indicated that although roads within the resettled community are in very good condition, roads from their community to the mining community are very bad. They revealed that they use the roads daily to their farms and to engage in economic activities at their old resident.

In the nearby non-mining community, 52.0 percent of the 100 respondents interviewed for the household survey indicated that the state of roads in the community was worse off before the arrival of PMGL while 48.0 percent stated roads were better off. However, 91.0 percent and 9.0 percent of the respondents indicated that the state of roads was worse off and better off respectively after the arrival of PMGL. However, it was observed that the roads at the nearby non-mining community were under construction. Respondents of the FGDs admitted that PMGL has nothing to do with the state of their roads and that it was a mere coincidence.

Table 6.7: State of roads before and after mining

	State of roads before mining				State of roads after mining			
	Mining Community (n=142)	Resettled Community (n=98)	Nearby Non-Mining Community (n=100)	Total (n=340)	Mining Comm. (n=142)	Resettled Community (n=97)	Nearby Non-Mining Community (n=100)	Total (n=339)
Worse off	52.8%	33.7%	52.0%	47.1%	90.1%	78.4%	91.0%	87.0%

Better off	47.2%	66.3%	48.0%	52.9%	9.9%	21.6%	9.0%	13.0%

	Test statistics	df	p-value	Test statistics	df	p-value
Chi-square	9.918[a]	2	0.007	9.082[a]	2	0.011
Likelihood ratio	10.077	2	0.006	8.402	2	0.015

Source: Field Survey (2019)

6.9 Cost of living before and after Mining

The cost of living before and after mining was also examined among the various community. At the mining community, 10.3 percent of the 142 respondents who answered the question said that the cost of living before the large-scale mining was worse off while 89.4 percent said the cost of living before the mines was better off. However, 93.0 and 7.0 percent of respondents of the respondents indicated that the cost of living was worse off and better off post-mining respectively. According to respondents at the mining community, the large-scale mining activity has affected some farmers as their farmlands formed part of the concessions of PMGL. Some respondents during the FGDs lamented losing their farmlands due to the mining activities of PMGL and are no more landowners. This result of the study confirms research by Hu et al., 2014 who asserts that expansion of mining activities does not only displace local farmers from their main source of livelihood but simultaneously renders them landless. Participants of the FGDs who were still farming at the time of the study reported low yield due to pollution from the mining activities. A respondent had this to say;

> *"Before the mines came here, I was a cocoa farmer with ten plots of land. When they came, my farmland was affected by the operations of the mines. Although I was compensated, I still have a passion for farming because that is what I have been*

doing for the past twenty years. The mines have really messed my life up. Even the ones which were not affected, I can't farm there for long due to the blasting of the mines, my yields have reduced" (FGD respondent at the mining community, 2019).

This revelation of low yields due to pollution from the mines confirms to research by Aragon and Rud 2015; George, 2013; Mensah, 2015 who concludes that pollution from mining operations destroys vital soil organisms, therefore, causes a decline in agricultural productivity in mining areas. Participants of the FGDS indicated that since most farmers have lost their farmlands, food production has reduced therefore resulting in food insecurity and a hike in food prices. These results confirm with Adu Yeboah et al. 2008, which stated that a high cost of living is common in mining and nearby communities.

Interview with the Chief of the mining community admitted that the cost of living had increased tremendously since the arrival of PMGL. The reason given was that the mines had attracted people from other communities to relocate to the host community, searching for jobs at the mines therefore demand for services has increased. This confirms a study by Gyan and Asante, 2017 who stated that natural resource exploration leads to an influx of people in communities located closer to it. Another reason attributed to the high cost of living was the high demand for housing due to internal migration. It was said high demand for housing has led to a high increase in housing prices since there are limited housing opportunities. This result is in line with studies done by Aragon and Rud, 2013 and Osei-Tutu, 2012, who reported that mining leads to the high cost of non-tradable goods such as high housing cost of living. Interestingly, some respondents who were house owners considered the high demand for housing as a good opportunity to make extra money, while others disagreed with them, saying high prices demanded by house owners have forced some indigenes to migrate to other communities where housing is cheaper. A respondent had this to say;

"Some people who could not afford housing here due to high prices have moved out of this community to other places. It not fair; this was not the situation at all when the mines were not here. I know a teacher at our secondary school who used to live here moved out to a different community because she could not afford her rent when her landlord increased her rent" (FGD respondent at the mining community, 2019).

The situation was not different in the resettled community as 14.3 percent of the 98 respondents indicated that the cost of living was worse off before the mines while 85.7 percent were of the view that the cost of living was better off before the mines came to their community. However, 92.8 percent and 7.2 percent of the respondents indicated that the cost of living was worse off and better off respectively after the arrival of PMGL. The reasons given during the FGDs were not different from the responses from the mining community. They attributed the high cost of living to food insecurity due to loss of farmlands, high prices of food and rents. Respondents in the resettled community also lamented that their expenditure has increased. This is because they spend a lot of money on transportation to their farms from their new place meanwhile it was just a walking distance from their formal places. Again, they claimed of facing high utility bills at the new site. This, they said, has affected them because they did not use to pay for water at their formal place since there were enough bole holes. Generally, respondents at the mining and resettled communities admitted that food has been expensive since the mines came. This result confirms research by Aragon and Rud, 2012 who argue that mining firms impoverish local communities where they operate. A respondent had this to say;

"Before the mines came, food and foodstuffs were cheaper here; the issue is how many people will eat from a chop bar or restaurants? Most people here cook for their families, but we the few who eat mostly from outside have seen that food prices

have increased since the mines came" (FGD respondent at the resettled community, 2019).

In the nearby non-mining community, 6.0 percent of the 100 respondents indicated that the cost of living was worse off pre PMGL while 94.0 percent were of the view that cost of living was better off. However, 47.0 percent and 53.0 percent of the respondents indicated that the cost of living was worse off and better off respectively after the arrival of PMGL. Participants of the FGDs at the non-mining community mentioned that housing prices have increased since some workers at the mining community have relocated to the nearby non-mining community when a conflict broke between the mining community and the mines which resulted in some deaths in early 2019. Again, it was also mentioned that foodstuffs were expensive compared to before PMGL since there is a high demand for foodstuffs from in the mining community which has resulted in the price increase. A respondent had this to say;

"Hmmmm, rent in this community has increased since a lot of people have moved here including workers of the mines. Prices for foodstuffs have also gone up since people from Ayanfuri and other communities come to buy from us" (FGD respondent at the nearby non-mining community, 2019).

Table 6.8: Cost of living before and after Mining

	Cost of living before mining				Cost of living after mining			
Mining Community (n=142)	Resettled Community (n=98)	Nearby Non-Mining Community (n=100)	Total (n=340)	Mining Community (n=142)	Resettled Community (n=98)	Nearby Non-Mining Community (n=100)	Total (n=340)

Worse off	10.6%	14.3%	6.0%	10.3%	93.0%	92.8%	47.0%	79.4%
Better off	89.4%	85.7%	94.0%	89.7%	7.0%	7.2%	53.0%	20.6%

	Test statistics	df	p-value	Test statistics	df	p-value
Chi-square	3.699	2	0.157	90.601	2	0.000
Likelihood ratio	3.852	2	0.146	84.386	2	0.000

Source: Field Survey (2019)

6.10 State of Diseases before and after Mining

Respondents for the household survey in the three communities were asked to access the state of diseases pre-mining and post-mining. The state of diseases before and after mining was also examined among the various community and the result is shown in table 6.9 below. At the mining community, 4.2 percent of the 142 respondents to the question said that the diseases were worse off before the large-scale mining while 95.8 percent said the state of diseases was better off before the mines came to the community. However, 95.8 and 4.2 percent of the respondents indicated that the state of diseases was worse off and better off post-mining respectively. During the FGDs, respondents indicated diseases such as cold, malaria, respiratory infections and skin disease have been some of the negative effects the mines have brought on their health. It was revealed by a health officer at Ayanfuri that skin diseases such as rushes and itching were the most commonly reported which he attributed to air pollution of chemicals of the mines when blasting is done. This is in line with a study done by Maliganya, Salatiel, and Renatus, 2013 in the Geita District of Tanzania where it was discovered some incidences of skin rashes and common colds resulting from pollutions from mining activities.

The situation was not much different in the resettled community as 5.1 percent of the 98 respondents indicated the state of diseases were worse off before the mines while 94.9 percent were of the view that diseases was better off before the mines came to their community. However, 88.8 percent and 11.2 percent of the respondents indicated that the state of diseases was worse off and better off respectively after the arrival of PMGL. During the FGDs at the resettled community, skin rashes, cold and cough were the most mentioned diseases associated with PMGL. Participants of FGDs attributed cough, cold to the dust pollution through the transportation of the ore to the sites of the mines, pouring of tailings and heavy tracks. The skin rushes were also attributed to the chemical released when blasting is done from the mines. A respondent had this to say;

> *"The operations of large scale mining companies cause the roads in the mining communities to spoil due to the heavy traffic and heavy-duty vehicles and machinery that are transported through the roads to the mining sites" (FGD respondent at resettled community, 2019).*

This confirms a report by the Minerals Commission's Inspectorate Division which stated that from 2010 to 2016, people living at mining catchments reported health problems of malaria and upper respiratory tract infections attributed to mining activities (Minerals Commission, 2016).

In the nearby non-mining community, 6.0 percent of the 100 respondents indicated that the state of diseases was worse off pre PMGL while 94.0 were of the view that the state of diseases was better than pre PMGL. However, 90.0 percent and 10.0 percent of the respondents indicated that the state of diseases was worse off and better off respectively after the arrival of PMGL. To explain the above result, respondents during the FGDs mentioned that the only health implications attributed to the large-scale gold mining activities was the inability to harvest rainwater since

harvest water turn black within a day. They, therefore, attributed it to the chemicals emission when blasting is done by PMGL. A respondent had this to say;

> *"When it rains and I store the rainwater, it turns black the next day which didn't use to be the situation before the mines. This is because of the chemicals in the atmosphere when the mines do their blasting. I only use such water to clean and not drink" (FGD respondent at the nearby non-mining community, 2019).*

From observation, it harvested rainwater was of great importance to the respondent as it is considered the purest water on earth.

To ascertain whether there exists a significant relationship between the communities and their response to disease pre-mining, the study made use of the chi-square test of independence. A significant $p - value > 0.05$ led to the non-rejection of no significant relationship between the communities considered and their response to disease pre-mining. The chi-square result for both pre-mining and post-mining indicates there is no statistically significant relationship between the communities under consideration and their response to diseases.

Table 6.9: State of Diseases before and after Mining

State of Diseases before mining	State of Diseases after mining

	Mining Community (n=142)	Resettled Community (n=98)	Nearby Non-Mining Community (n=100)	Total (n=340)	Mining Community (n=142)	Resettled Community (n=98)	Nearby Non-Mining Community (n=100)	Total (n=340)
Worse off	4.2%	5.1%	6.0%	5.0%	95.8%	88.8%	90.0%	92.1%
Better off	95.8%	94.9%	94.0%	95.0%	4.2%	11.2%	10.0%	7.9%

	Test statistics	df	p-value	Test statistics	df	p-value
Chi-square	.392	2	0.822	4.707	2	0.095
Likelihood ratio	0.389	2	0.823	5.024	2	0.081

Source: Field Survey (2019)

Respondents were again asked a question "has the mines improved health services in your community? They were asked to indicate whether they strongly agree, agree, undecided, disagree and strongly disagree with the under-listed questions. The results from table 6.10 below show that at the mining community, out of the 142 respondents who answered this question, 68.3 percent strongly disagreed that the mining has improved the health service in their community, percent, 19.0 indicated that they disagreed while 11.3 percent agreed that PMGL has increased health services. Participants of the FGDs indicated that there is only one health facility in the community close to the resettlement community and is been owned by the Methodist Church of Ghana. They expressed their disappointment in the mines for not building a hospital or clinic for the community. Others were also of the view that although PMGL has not built the hospital, they occasionally organise health screening and counselling for them.

In the resettled community, out of the 98 respondents who answered this question, 61.2 percent strongly disagreed that the mining has improved the health service in their community, 28.6

indicated that they disagreed while 10.2 percent agreed that PMGL has increased health services in their community. It was revealed during the FDGs that the mine has not provided them with any health facilities, however, it was mentioned that periodically the mines organise health screenings for them.

In the nearby non-mining community, 27.6 out of the 98 respondents who answered this question, indicated they strongly disagreed that the mining has improved the health service in their community, 56.1 indicated that they disagreed while 11.2 percent agreed that PMGL has increased health services. It was revealed during the FDGs that the mines once a year provide health screenings and counselling for them. According to participants, this has improved their knowledge on health-related issues although no physical facility has been built for them.

A chi-square test of independence was performed to ascertain if there exists a significant relationship between health care services and the community. The study revealed that a significant p-value of 0.000, $p - value < 0.05$ led to the rejection of no significant relationship or association between the three communities considered and their response to improved health services. It was thus concluded from the study that there is a significant relationship or association between the three communities under consideration and their response to improved health services.

Table 6.10: Improved Health Services as a result of large-scale mining

	Community	Test Statistics

Improved Health Services	Mining Community (n=142)	Resettled Community (n=98)	Nearby Non-Mining Community (n=98)	Total (n=338)				
Strongly Disagree	68.3%	61.2%	27.6%	54.4%	Pearson Chi-Square	55.255[a]	8	0.000
Disagree	19.0%	28.6%	56.1%	32.5%	Likelihood Ratio	57.092	8	0.000
Undecided	1.4%	0.0%	1.0%	0.9%				
Agree	11.3%	10.2%	11.2%	10.9%				
Strongly Agree	0.0%	0.0%	4.1%	1.2%				

Source: Field Survey, (2019)

6.11 Conclusion

This section examined the social effect of the large-scale mining in the chosen communities, namely mining community, a resettled community and a nearby non-mining community. Indicators such as electricity, water supply, job opportunities, social amenities, peaceful environment, and cost of living were examined. Respondents in the chosen three communities were asked to indicate whether the above indicators were worse-off or better off before and after PMGL. Generally, across the three communities considered for the study, respondents indicated that the living standard of the inhabitants has been worsened. However, the mining and resettled communities formed the majority who reported that PMGL has affected their living standards negatively. At the nearby non-mining community, 40% of the respondents who were interviewed indicated living standards have worsened due to the high cost of farm produce and rents.

Again, it was shown in both the mining and resettled communities that electricity, water supply and job opportunities have worsened after the arrival of PMGL in Ayanfuri. Specifically, in the mining community, respondents complained of loss of jobs either from farming and galamsey since PMGL has deterred them from mining. However, the major problem reported by respondents at the resettled community was high utility bills and unemployment. Respondents indicated that they were faced with high payment of water and light bills which was not the case at their old

residence. Also, those who had lost their farmlands reported of unemployment although they been compensated in cash by PMGL. Some complained of the unavailability of lands in nearby communities for farming while others complained of bad investment choices. Interestingly at, the nearby non-mining community, it was revealed that the state of electricity and water supply has not been affected much by PMGL. The only concern of the respondents was that rainwater is being poisoned by chemicals released when blasting is done by the mines. When respondents were asked about job opportunities created by the PMGL, they exhibited gratitude in the sense that few inhabitants including their chief have been employed by PMGL.

Again, respondents both at mining and resettled communities complained that social amenities and peaceful environment were better off before PMGL but have worsened off after PMGL. Respondents at the mining community were of the view that PMGL has renovated few school facilities and built new schools which were affected, however, it was alleged that PMGL could have done better. There have been some incidents of clashes and chaos among community members, between the community and traditional leaders and between the community and Operation Vanguard. The situation was a little different at the resettled community as respondents also reported of re-building of schools which were affected at formal residence, ICT facility and a police station, however, respondents expressed disappointment with the mines for not providing the community with a market centre and public toilet facility for visitors. When asked if the peace of the community has improved or compromised, it was revealed that the have been several agitations between the mines and the inhabitants due to unsatisfactory compensation packages and lack of employment by the mines. The result from the household survey and FGDs at the nearby non-mining community indicates that there has not been much difference in the state of amenities before and after PMGL although there has been a little improvement, however, the credit was given to the traditional leaders and not the mines. Again, it was revealed that the peace of the

community has reduced after PMGL which has made people relocated to the nearby communities such as Nkutonsu.

Cost of living and state of diseases before and after PMGL was also examined. At the mining community, it was reported that the cost of living has increased compared to before the arrival of PMGL due to loss of farmlands, unemployment, loss of jobs and low farm yields which has resulted in high prices of foodstuffs. The resettled community also reported the high cost of living. Due to transportation to farms, high utility bills and the high cost of foodstuffs. Interestingly, high cost of foodstuffs and rent was also reported at the nearby non-mining community due to the high demand for goods and services since lots of people have migrated to the community. Respondents in the three communities were asked to compare the state of diseases before and after PMGL. It was revealed at the mining community that the activities of PMGL have resulted in diseases such as cold, malaria, respiratory infections and skin diseases such as skin rashes and itching which were the most reported health effects of the mines. The result was not much different at the resettled community as skin rashes, cold and cough were also reported as diseases associated with the mining by PMGL. However, in the nearby non-mining community, no health effect was linked to the activities of PMGL although it was revealed that stored rainy water turns black which was associated with chemicals released by the mines when blasting is done. In all the three communities for the study, it was noted there has not been the provision of health facilities by the mines.

CHAPTER SEVEN

INSTITUTIONAL SUPPORT SYSTEMS AND ADAPTATION STRATEGIES ADOPTED

7.1 Introduction

The tension and economic changes in areas of occupation, income, food security and loss of farmlands and transition from agriculture, among other social impacts of mining, have made it necessary that people and households that are affected by the activities of the large-scale mining activities devise adaptive strategies to ease, if not to eliminate these adverse effects on their livelihoods. Institutional support systems available in mining communities can help affected persons to manage the effects of mining. This chapter assesses the available institutional support systems and how effective they have been in helping affected households maximize the positive effect of the presence of PMGL and reduce the negative effects of the activities of PMGL. This chapter also explores the various adaptive strategies adopted by the communities to better their livelihoods.

7.2 Effectiveness of Institutional Support Systems

The effects of large-scale mining in the communities have been identified as comprising of both adverse effects and positive ones. However, the people of the mining and resettled communities perceived the adverse effect to surpass the positive impacts as such, hence the several conflicts the PMGL and the communities. In April, 2019, there was feud between the mining company and the people in the community led to two deaths and a person paralyzed (Daily Graphic, 2019). The people in the community perceive that the greatest benefits of the large-scale mining are enjoyed by the government at their expense and, as an attempt to register their derision for such an act, they went into conflict with the workers of the large-scale mining company and the Operation Vanguard which is a task force instituted by government to deter people from illegal mining. The institutional

support systems present in the communities to help maximize the benefits of the mining as well as minimize its adverse effect were state institutions, traditional leaders and community support systems which are discussed subsequently.

7.2.1 State Institutions

The FGDs and key informant respondents at both mining and resettled communities mentioned the presence of the assemblyman, officials of the Mineral Commission (MC), Lands Commission (LC) and Environmental Protection Agency (EPA), visit the communities from time to time while the Operation Vanguard (a group formed by the Government of Ghana to stop illegal mining in mining communities) are stationed in the communities. However, respondents were quick to say that they do not see the benefits they have gain from these government institutions. They claimed the mining company had bribed them to seek their interest rather than the interest of affected communities. Some respondents remarked as follows:

> *"These government institutions have their offices in Tarkwa and Dunkwa-on-Offin, they only come here when the need arises. I think they have all been bribed by the mining company seek their interest, this is because whenever there is a misunderstanding between the mining company and us, they do not act in our favour. They pretend as if nothing has happened" (FGD, respondent at the mining community, 2019).*

> *"Those people who valuated our lands and farm produce to be compensated cheated us, they were one with PMGL. We complained a lot to them about our dissatisfaction with their valuation but they ignored us. We are not even sure if they were from Lands Commission or private evaluators hired by the mining company" (FGD, respondent at the resettled community, 2019).*

Another respondent also lamented on the ineffectiveness of EPA per the following expression:

> *"That institution is useless; what is their use? What have they done concerning the air and dust pollution that emanates from the activities of the mines? At least they should teach us the citizen on precautionary measures to limit the negative effects of air pollution" (FGG Respondent at the resettled community, 2019).*

The above quotation depicts the lack of trust the community members have in the government institutions to seek their interests. The Assembly representative however refuted the claims made by the communities and stated that all their claims are assumptions and far from what is happening. It was alleged that Operation Vanguard group were bribed by PMGL hence every action of theirs favours them However, an interview with an officer of Operation Vanguard denied the above claims. He stated that their task is to prevent illegal mining and deter the galamseyers from encroaching the concession of PMGL. He revealed that they have had several clashes with the mining community and the resettled community over encroaching on the concession of PMGL which have resulted in some deaths in the discharge of their duties. According to him:

> *"The youth here are very stubborn. Notwithstanding everything we have done to deter them from encroaching the concession of the mines, they still do it. What do you expect us to do? Where persuasion fails, force must be applied; we are just doing our job" (Key Informant interview at the mining community, 2019).*

In the nearby non-mining community, no government institutions were present in the community due to the mine at Ayanfuri. Respondents, however, mentioned that EPA should have been sensitizing the community on how to manage the pollution from the mines especially polluted stored rainy water.

7.2.2 Traditional leaders

As has been noted in Chapter two, that in Ghana, traditional leaders in communities and towns hold considerable authority at the local levels and are respected as the custodians of lands (Wilson, 2015). Some chiefs are allowed by their customary system to be in charge of allocating lands to their indigenes. In consultation with elders and opinion leaders, chiefs resolve and settle disputes. Respondents across the three communities for this study stated that chiefs and sub-chiefs allocate farmlands for their farming activities and play a greater role in allocating farmlands to mining companies.

It was claimed by the mining and resettled communities FGDs respondents that the mining company has bribed the chief and its sub-chiefs and some government officials to pursue their course. As such, some of these leaders were alleged to have been compensated with houses, cars, money and employment for their family members. It was observed that both communities have the same chief and sub-chiefs. According to the respondents of both communities, these deeds of the mines have compelled the local chief, sub-chiefs and political officials to always support the mining company them whenever conflicts erupted between the mining company and the communities. It was also alleged that the mining royalties paid to the chief are not used to develop the communities but rather for his selfish gains. A respondent during the FGD stated:

> *"The company has bought all our chiefs and officers by giving them fat envelopes every month, buying them cars, houses and employment. Now all the chiefs and their families have jobs to do, including some as contractors. Our 'abusapanyin' (family leader) is a contractor of the mines, and they normally employ their family members to work with. Because of this, if you send your problem to them, they will not mind you but rather accuse you of talking against the chiefs and gods of the*

land. Our chief has relocated to Accra, only comes here at midnight and lives early morning the next day because his life has been threatened by the indigenes. This is because we are bitter, and he is afraid we might attack him". (FGD respondent at the mining community, 2019).

Before the study, there have been several confrontations between the community and their local chiefs, resulting in commotion at the chief's palace in June, 2019, where many things were destroyed. According to the Chief of the mining community, strategies had been put in place after that incident, such as levy fines to deter people from misconduct behaviours. This, according to the chief, it serves as a deterrent to the youth. He also stated that the royalties paid by the mining company are meant for effective running of the chieftaincy and not for the development of the community. During a key informant interview with one of the leaders of the community regarding the claims made by their chief, he noted the following:

"Why won't we fight them? They have failed to protect our interest in the mines and have refused to resolve the discord between the mining company and us, which resulted in two deaths and some injuries. We will fight for our rights. Although the Member of Parliament and the District Chief executives have been intervening in addressing some of this strife, however, there are moments that they become non-responsive to us" (Key Informant Interview respondent at the resettled community, 2019).

The above quotation indicates that the communities have no trust in their traditional leaders seeking their interest when it comes to the mines and has been unsuccessful in solving outstanding issues between the mines and the communities. However, respondents at the nearby non-mining community made no such claims. This is expected since they are not directly affected by the

activities of PMGL. They were instead full of praises of the mining company for employing their chief to work at the mines.

7.2.3 Community support Group

Multi-national mining companies who operate in Ghana pay taxes and royalties to the central government. These benefits do not necessarily 'trickle down' to host communities exposed to the adverse effects of the operations of the mines. Hence, mining communities fight large-scale mining companies to obtain maximum benefits for their communities. Upon my visit to the mining and resettled communities, it was noted that these two communities had formed a community support group. An interview with one of the group leaders revealed that the sole purpose of the group is to seek the interest of the communities since their traditional leaders and government agencies have failed them. He mentioned that the group is made up of mostly youths and a few elderly people. The group meets once in two weeks to listen to the complaints of its members and come up with new strategies to confront issues that come up. This is what one of the leaders had to say:

> *"We cannot sit idle and do nothing; we will not be taken for granted. Our leaders have failed us by supporting a foreign multi-national company rather than their people. Whatever means by any means we will strive for benefits due us as a mining community; enough is enough" (Key Informant Interview at the mining community, 2019).*

During an interview with the Chief of Ayanfuri, he admitted to his awareness of the community support group, but he stated that the group was formed without his knowledge and permission; hence he disassociates himself from them. In the nearby non-mining community (Nkutonsu) there was no existence of any support group of this kind in the community.

In the nearby non-mining community, there was no community support group, however, respondents indicated that concerns and complaints relating the activities of PMGL such as air pollution which affects harvest rain are channelled through the District Chief Executive (DCE) to be addressed.

7.3 Local Adaptation Strategies

The study also sought to investigate the coping strategies undertaken by the selected communities to curb the adverse effects of the activities of the large-scale mining company. During the FGDs, respondents shared various strategies adopted to better their livelihoods.

7.3.1 Coping with the loss of farmlands

Farmlands were lost due to the activities of PMGL, hence victims had to devise some means to cope with it. This is because farming is the major occupation of the three study communities. Respondents were asked how they were coping with losing their source of livelihoods. At the mining, all respondents who have lost their farmlands expressed resentments of buying foodstuffs that they used to grow themselves. Some respondents revealed that to be productive, they have acquired farmlands from nearby communities to farm since farming is what they know how to do best. Others also have ventured into trading of goods and services, others mentioned that they have invested monies received as compensation into transport business while others invested their monies into treasury bills. However, despite these adaptive strategies adopted, affected farmers lamented challenges they face such as high charges for the farmlands from nearby communities, unfavourable terms of land acquisition and long-distance travel to their new farms, which according to them affect the duration spent in farming. At the time of the study, it was reported that those who invested their monies in microfinance institutions have lost their monies. From

observations, the affected people were very bitter and blamed the mining company (PMGL) for their misfortunes. During a FGD a respondent had this to say:

> *"I invested some of the compensation money given to me into treasury bills, however, since farming is my passion, I cannot sit idle doing nothing. Through a friend, I was able to get farmland in the nearby community from the money I received as compensation to farm, although I have to travel quite a distance to get to my new farm. It is better than doing nothing. To me, it is one of the easiest adaptive strategies if one was born a farmer although it comes with its challenges" (FGD respondent at the mining community, 2019).*

In the resettled community, the adaptive strategies used were not much different from that of the mining community as respondents also acquired farmlands from nearby towns, ventured into trading while others invested compensation monies in financial institutions. Interestingly, some respondents invested their monies in building houses for rental, which they considered as an investment for their children. However, some reported that their building projects have stalled since they have exhausted all monies received as compensation. They expressed their regrets about not making better choices as revealed by one participant of the FGDs.

> *"Madam, when I received the money I was so excited although I wanted more. I hurriedly without deep thinking started building so I can rent it out and make extra money for my upkeep. I am done with the roofing and the money is finished, I don't know what to do and I don't have any source of income. I have been thinking of selling it. The mines should have educated us on how to invest our monies but they didn't" (FGD respondent at resettled community, 2019).*

It was noticed that none of the community members interviewed during the FGDs in the nearby non-mining community had lost their farmlands or places of abode; hence no adaptive strategies were adopted by the indigenes. However, they confirmed that some people from mining community have acquired farmlands from them to farm in the community.

7.3.2 Coping with displacement

The study results indicate that affected households whose farmlands form part of the mining concession in then mining community were given cash compensation while members of the communities whose places of abode were affected were resettled to a different location with modern built houses.

Figure 7.1 Houses at the resettlement community as a compensation

Source: Field Survey (2019)

However, resettled households lamented on the affect the displacement has brought on their livelihoods. During the FGDs, participants in the resettled community who were victims of displacement mentioned that they were faced with high utility bills, long-distance to their farms,

lack of economic activities in the new site, lack of social amenities such as public toilets, lorry station and hospital. Uniformly, during the FGDs, the participants proposed that the mining company should pay half of their utility bills to ease their burden. This is a quotation from a participant:

> *"At my old place, I was not buying water because we had boreholes as our source of water and distance to my farm was short. Although they have provided us with modern houses with tap water compared to our old place, our expenditure has gone up because of high water and electricity bills. The most annoying part is that the bills do not come regularly, sometimes it comes in three to four months and is huge" (FGD, respondent at the resettled community, 2019).*

The above quotation indicates that although households have been resettled to a new location with modern housing structures, all is not well with them. Interestingly, another participant had this to say:

> *"For me, I prefer my old place; life was fun there with all my friends. Business activities here are slow, so most of us end up going to the old place every day for foodstuffs, which comes with a cost (transportation cost). I sell in the market, so I have to go there in and out every day to transact my business, is affecting my profit because of lorry fare and payment of high utility bills" (FGD, Respondent at the resettled community, January 2019)*

Respondents mentioned they have been coping with high utility bills by putting off electrical gadgets during the day when no one is home to reduce their electricity bills. Most women complained of lack of economic activities which makes it difficult to set up any business venture. Regarding the lack of economic activities at the new sites, the respondents stated that they have

no choice but to travel to the old site to buy groceries and foodstuffs although there are few 'table top'or kiosks available at the resettled site. Some respondents also mentioned that they had built temporary farmhouses at their new farms where they sleep for some days in a week to work on their farms and return home when the week's job is done.

Some schools which were affected at the old place have been reconstructed at the resettled site. According to respondents who still lived in the mining community, their wards have to be transported to school every day which increases their financial burdens. Some also lamented especially women the stress they go through when it rains as it is difficult getting cars to either take their children to school or bring them home after school. When they were asked how they were coping with this situation, they indicated doing nothing about it but were hopeful that their plea to the mines to provide buses to commute their wards to school would be fulfilled. A respondent had this to say;

> *"This situation is affecting my finances in a great way. I sell cooked rice and yam in the afternoon and my three children used to come for food during their lunchtime, but now because their new school is far, they cannot anymore. I have to give them money for food during their break meanwhile I have plenty of food" (FGD respondent at the mining community, 2019).*

The above quote depicts that not only people who have been resettled to the new site experience adverse effects of displacement but some indigenes who still live in the old place (mining community) are affected too although differently.

7.3.3 Coping with unsatisfied compensation packages

In the mining community, the respondents who lost farmlands were not pleased with the cash compensation given them. Compensations were based on the size of land, state of land (either bare

land or lands with crops). Respondents mentioned that the monies given to them were not enough compared to the value of their lands. It was emphasized that their lands were valuable assets that could feed their families for years and could be passed on to generations; a compensation of a few thousands of cedis can therefore, cannot pay them off. A respondent had this to say;

> *"my farmland was given to me by my parents, who are no more, and I intended to leave it for my children. Now you take my land and give me some chicken change compared to how much money the mines will make from the gold on my land. Can the money give feed my children as long as I live? I will choose to have my land any day over the few thousand given" (FGD respondent at the mining community, 2019).*

Lack of transparency during the valuation process was mentioned as one reason why people were not satisfied with the compensation. Some alleged that the traditional leaders connived with the mining company and brought their evaluators to evaluate their lands and paid low rates as compared to other mining communities. However, the Chief and an officer of PMGL refuted the above allegations and stated that the evaluators were from the Lands Valuation Division (LVD) of the Lands Commission. This confusion could be a result of a lack of proper community engagement. Some unsatisfied respondents refused the offer made to them and have hence taken the PMGL to court for justice. Although most respondents were not satisfied with the compensation, to take care of their families adopted some coping strategies to improve their well-being. Some invested in other alternative livelihoods such as trading, acquired farmlands in nearby villages for their farming activities while some invested their monies in treasury bills. From observation, it was evident that respondents were resentful towards the mines and the traditional leaders for cash compensation they received from PMGL.

At the resettled community, the respondents mentioned that each household was given 500 Ghana Cedis as payment for the cost of moving from the old place to the resettled community. From observation, the new houses had better building materials and modern architecture compared to houses at the mining community. It was expected that at resettled community, respondents will be the category of people whose place of abodes were affected, however, the study revealed that there existed people who had lost either houses or farmlands or both. For those who lost houses, some were full of gratitude for the spatial layout of the community such as tarred roads, upgraded school buildings, household toilets facilities and portable water.

Despite the above-mentioned positive attributes of the resettled community, few expressed their dissatisfaction with the sizes of the rooms, lack of public toilets and lack of trees around the houses to shield them from the sun. To cope with the above-mentioned challenges, some rented some rooms in their houses to gain some money to pay the high utility bills while others aside from farming ventured into trading to support the income made from farming. The portion of people who lost both farmlands and houses also mentioned that compensation cash has been invested into other alternative livelihoods such as trading. Others also acquired farmlands in nearby villages for farming while others invested their monies in treasury bills. A respondent had this to say;

> *"I lost both farm and house, I was compensated with this new house for my old house and money for my farmlands. I have invested the money in treasury bills and also opened a provision shop for my wife, but unfortunately, my investment has gone bad, the microfinance has collapsed. It has affected me greatly, thanks for the shop my wife is running, I don't know what I would have done" (FGD respondent at the resettled community, 2019).*

In the nearby non-mining community, none of the respondents interviewed were displaced or lost farmland.

7.3.4 Coping with Health Effects of Large-Scale Mining

Respondents were asked during the FGDs at the mining and resettled communities how they were coping with the health-related health challenges associated with the activities of PMGL. Strategies revealed were that they use mosquito-treated nets when sleeping and repellents during the day to prevent bites of insects. Others also mentioned that although mosquito insecticides are costly, they use them occasionally.

> *"for me, the safety of my family is important to me, so I make sure they are safe by providing mosquito insecticides to prevent mosquito bites, however because it costly, we do not use it every day. I make sure doors are closes always to prevent mosquitoes and insects entering the rooms" (FGD respondent at the mining community, 2019).*

Some respondents at the resettled communities also mentioned diseases such as colds, coughs and skin rashes and itching. Handkerchiefs are used to cover the nose when travelling to the mining communities to engage in economic activities so they do not inhale dust from the untarred roads and chemicals from the blasting at the mines. Ointment and balms were also used to limit body itching. Those affected sought medical attention for treatment. Ointments were mentioned to ease skin itching. A respondent had this to say;

> *"Oh, cough and cold are common here; what can we do? We have to learn to leave with, I never go out of my house without ointment to ease itching from mosquitos and insect bites. When I am approaching a dusting area or when blasting is done,*

I cover my nose with a handkerchief". (FGD respondent at resettled community, 2019).

An interview with a health officer at the Pentecost hospital, the only hospital in the three communities, revealed that common cold, skin diseases and malaria were the most reported cases in the hospital. He was therefore quick to mention that malaria cannot be attributed to the mining company's activities since there is a high number of people from non-mining communities with a high rate of malaria infection. However, with cold and skin disease, he was emphatic that large-scale mining activities could be a contributing factor. On the side of the mining company, an office of PMGL indicated that the mines organise periodic health screening and health training for community members to cope with the health effects their activities might have caused. Some respondents across the three communities confirmed the health screening.

However, the only health challenge respondents at the nearby non-mining community mentioned was chemicals in rainy water due to the blasting at the mines but were therefore not sure what sickness the usage of the water has had on their health. They indicated that whenever it rains, stored water turns black the following day; this was associated with the air pollution from the mines. They, therefore, mentioned that they have stopped using such water for cooking or bath but rather use it for cleaning and washing of clothes. A respondent had this to say;

"I can't say that the mines at Ayanfuri has affected the health of the people here, although when the blasting is done it affects uncovered stored water or stored rainy water. I believe is the chemicals when blasting is done that cause it" (FGD respondent the resettled community, 2019).

7.3.5 Coping with social tension and grievances

From observation, there seems to be much resentment by the indigenes in both at the mining and resettled communities as it was evident that people were not happy with the compensations given and also unsatisfied with development in the communities. This was confirmed in both during the FGDs in both communities. The resentment has resulted in several conflicts and confrontations between the mining company and the inhabitants.

It was also discovered that there have also been some agitations by the community against the traditional leaders as it was alleged that they have connived with the mines to cheat the indigenes of their compensations from the mines. Respondents had this to say;

> *"There was no chaos in this community before the arrival of PMGL although other mines have come to this community. This is because as a community we are not happy with the mines for turning deaf ears to our complaints and concerns. I don't blame them, it the leaders that have failed us by supporting the mines instead of otherwise" (FGD respondent at the mining community, 2019).*

> *"Hmmmm, I am disappointed in the mines, they refuse to employ the youths and cheated us with our compensation, what do you expect? We fight back right? That is what we have been doing till they hear us although there is calm now but that won't be long if they refuse to listen to us" (FGD respondent at the resettled community, 2019).*

When respondents were asked how they were coping with the periodic clashes, they stated demonstration as the medium they use to express their displeasure. However, it was stated that tension has subsided due to the intervention of the community support group leaders who asked them to halt agitating while they devise strategies to get the mining company to respond to their

complaints. It was alleged that the chief has been chased out of the community and only comes to the community at dawn and escapes early morning to Accra. There existed a compliant office of PMGL in the community to address the grievances and complaints. According to a worker at the mines, the office has been closed since the community personally attacked the workers in the office. During a key informant interview with the chief, he denied the above allegation that the traditional leaders conspired with the mines to cheat his people.

7.3.6 Coping with High Cost of Living

Uniformly across the three communities, respondents revealed that the presence of the PMGL has led to a high cost of living, especially accommodation and food. To cope with the high cost of living, adaptive strategies such as backyard farming, buying of foodstuffs from nearby communities at cheaper prices, reduced expenditure were devised by the respondents to ease their financial burdens. A respondent had this to say;

> *"Before PMGL came to this community, foodstuffs were in abundance and cheap but is not anymore. Everything is expensive now because only lucky few still have lands to farm because of that food is now expensive" (FGD respondent at the mining community, 2019).*

Also, in resettled community, respondents mentioned that they cope with high food prices by practising backyard farming to supplement what they buy from the markets while others purchase foodstuffs from nearby communities, which is cheaper to feed their families. Again, some increased working hours on their farms to increase yields, rented some of their rooms out to make extra money while some also dug bore holes for water to reduce utility bills.

However, respondents at the nearby non-mining community mentioned no food shortage in their community, however, prices have increased for food and accommodation. Some mineworkers,

especially from the mining community have relocated to their town for safety after a conflict broke that took place at the mining community. This confirms a study by Ady Yeboah (2008), who stated that high cost of living is one of the major negative impacts of mining within communities near mining sites. Most respondents indicated that they were coping with the situation without doing anything while few indicated that they sometimes go to nearby towns to buy foodstuffs at cheaper cost. Interestingly, the respondents who were landlords were happy that the high demand for accommodation has helped them financially.

7.4 Conclusion

The chapter presented the institutional support systems that were available in the communities to help affected households minimize the negative effects of the activities of PMGL. The chapter also presented strategies adopted by households in coping with the adverse effects of the mines on their livelihoods. In both the mining and resettled communities, it was revealed that there existed officials from MC, LC, EPA, Assemblyman, social support groups and traditional leaders. However, efforts from the above except social support group was very minimal in helping to address issues of the activities of PMGL especially the government agencies. It was observed that officials from the above-mentioned government agencies were not stationed in the communities but rather at Dunkwa-on-Offin and occasionally visits the affected communities. Traditional leaders were accused of being bribed by the mines to seek their interest on issues, they expressed disappointment in all the institutions except the social support group which was set up by the affected communities (mining and resettled communities) to champion the interest of the affected households and the entire communities.

The study also revealed several coping strategies adopted by affected households to minimize the effects of PMGL. In the mining community, respondents coped with losing farmlands by acquiring farmlands and buying foodstuffs from nearby communities while others invested cash compensation into trading in goods and services. Similarly, at the resettled community, respondents mentioned that they acquired farmlands from nearby communities, ventured into trading, others also used compensation money to put up buildings whiles others invest monies in treasury bills. The activities of PMGL have displaced households to a resettlement site called Kurofofrom which is approximately 15 minutes' drive from the mining community. Although the new site has a good layout and modern architecture with tarred roads, all was not well with households as they complained of long distance to farms, high utility bills and lack of economic activities. In an attempt to cope with the challenges of displacement, some respondents built farmhouses where they stayed during the week and come home on weekends to reduce the cost of transportation while others put off electrical gadgets when stepped out of the house to reduce utility bills. To cope with the lack of economic activities at the resettlement community, no coping strategies had been adopted at the time of the study as respondents mentioned they still go to the old site to engage in economic activities. At the mining community, respondents mentioned during the FGDs that though they have not been displaced, their wards schools have been affected by the mines, hence new schools have been built at the resettled community. Transporting children to and from schools have affected their expenditure. To cope with this, households has come together to rent a bus which transports their wards to school at a cheaper cost compared to doing it individually.

Some affected households expressed dissatisfaction with compensation packages given by PMGL. To cope with unsatisfied compensation especially cash, it was revealed by some respondents at the mining community that nothing has been done with it whiles others had taken PMGL to court

to seek justice. However, those who have received compensations mentioned invested monies into other alternative livelihoods to take care of their families. At the resettled community, some respondents rented some rooms out to make extra money while others invested the little monies received into treasury bills. Diseases reported which were attributed to the mines were respiratory tract infections such as cough, colds, malaria, skin rashes and itching. Mosquito-treated net, repellents were used to cope with the above-mentioned health effects. Similarly, at the mining community, diseases such as cold, cough, skin rashes and itching were also reported. Ointments and painkillers were used as a remedy for skin rashes, cold and itching. Handkerchiefs were used to cover the nose from inhaling chemicals when blasting is done by the mines. When it came to social tension and grievances, both mining and resettled communities mentioned that no coping strategies have been adopted to tackle social tension. However, demonstrations were the only strategy stated of dealing with grievances.

The high cost of living was one of the negative effects attributed to the presence of PMGL. At the mining community, it was reported that prices of foodstuffs and rent have increased tremendously since the arrival of PMGL. Backyard farming, buying foodstuffs from nearby communities and reduced expenditure were some of the adaptive strategies adopted by respondents in coping with the high cost of living. Similar, respondents at the resettled community also delved into backyard gardening, increased working hours at the farm and rented some of their rooms to earn extra money. Respondents at the nearby non-mining community revealed that they coped with the high cost of living by spending more hours on the farm to increase farm produce to make more money since the demand for foodstuff was on the rise. It evident that both mining and resettled communities adopted similar coping strategies. The nearby non-mining community respondents had little to say on the coping strategies as they were not directly affected by the activities of PMGL.

CHAPTER EIGHT

CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

This study examined the socio-economic effects of large-scale gold on local communities in Ghana. It compares three communities to investigate the economic, and social effects of large-scale gold mining and the adaptive strategies undertaken by affected households to improve their livelihoods. The chapter summarizes the findings of the study and deduces some conclusions from the results obtained. Some policy recommendations are drawn from the conclusions to help address the issues that host mining communities face.

8.2 Conclusion

There is a difference in the economic outcomes in the three selected communities such as employment, household income and food insecurity. For employment, the employment pattern of respondents in the resettled and mining communities changed as most of the respondents who were into farming migrated to trading. This is because some respondents lost their farmlands to the mines which collaborate with research by Aragon and Rud, 2012 who concludes that Large Scale Mining (LSM) the affects farmlands of inhabitants where farming is the main source of livelihood. This resulted in unemployment as people were no more into farming. However, in the nearby non-mining community respondents who were previously into Small Scale Mining (SSM) before PMGL lost their job because where they used to mine formed part of the concession of PMGL. In the nearby non-mining community, the percentage of respondents who were unemployed by PMGL was reduced post-PMGL. This is because some respondents have been employed by PMGL and the percentage of respondents who were into farming rather increased which was attributed to the fact that the activities of PMGL did not affect farmlands in the nearby-non-mining community. Farm and non-farm incomes of households in the Mining Community and Resettle Community were reduced from 2015 to 2016. This is because PMGL started its operations in 2014, therefore

respondents who lost farmlands reported of reduction in their incomes but began to rise from 2017 to 2018 since some affected households acquired alternative farmlands from nearby communities. The non-farm income of respondents in both communities also began to rise from 2017 to 2018 which was attributed to successful coping strategies and monies received as compensations whiles others invested monies into trading. In the nearby-non-mining community, the incomes of respondents also behaved similarly to the other two from 2014 to 2016 but also began to rise in 2017.

Food insecurity was reported across the three selected communities, however, the degree varied from community to community. In the mining community and resettled community, food production was reduced due to the loss of farmlands thereby leading to rising prices of foodstuff. Respondents from both communities indicated that they made changes to their food preferences. However, the situation at the nearby-non-mining community was different as foodstuffs were in abundance but because people from the mining and resettled communities bought foodstuff from them at cheaper cost led to a rise in food prices.

The presence of PMGL promoted social lives, social tension, displacement, health implications, dispositions, state of roads and high cost of living. Across the three communities, respondents reported increased cases of social vices which were attributed to the arrival of PMGL. Respondents in the mining and resettled communities reported an increased number of agitation, unrest and clashes due to unsatisfied compensation packages, unaddressed grievances and lack of transparency. Also, roads in the two communities have deteriorated due to the use of heavy-duty vehicles of the mines which was not the case in the nearby-non-mining community. Again some health implications such as respiratory tract infection, malaria and skin diseases were reported in the mining and resettled communities, however, the nearby-non-mining community only reported poisonous harvested rain due to pollution by the mines when blasting is done.

Institutional Support System identified by the study presents in the communities were government institutions, local or traditional institutions and community support group but there seems to be poor collaboration among them. some coping strategies adopted by affected households acquired farmlands from nearby communities shifting from agriculture to trading in goods and services, minimizing the use of water to reduce utility bills, built temporary farmhouses to reduce time and transportation to new farms, use of mosquito-treated nets, insecticides and ointments.

8.3 Recommendations

8.3.1 Government should institute sustainable development projects in mining and nearby non-mining communities to enhance the lives of its inhabitant. Most at times when a mine closes up, the economic activities in host communities and nearby communities fades away thereby leaving the inhabitant poorer. Government should collaborate with mining firms, non-governmental organisations and institute developmental project such as vocational education where people would be trained in other aspect of livelihoods aside farming so that they can fall on it to improve their economic lives independent of mining and farming. This will ensure that mining communities do not become ghost towns even after cessation of mining. Governmental projects such as Alternative Livelihood Development Programme should be extended to mining and nearby non-mining communities to ensure socio-economic development of people living in mining communities.

8.3.2 Provision of alternative livelihood programmes and financial assistance

Host communities who lose their sources of livelihood should be provided alternative sources of livelihood by the mining company. For example, if the predominant occupation of a host community is farming and farmlands are lost for mining, farmlands should be acquired by the mines in nearby communities for affected persons to minimize their risk of impoverishment. This

is because it was evident from the study that cash compensation did not help recipients improve or maintain their living standards. Many of the persons affected by the mining activities and were compensated in cash were not able to invest their monies into lucrative businesses to enable them to become self-sustainable. This is an indication that most of these rural folks are not adequately equipped with proper financial management skills. This study therefore recommends that before compensations are offered to affected households, government in collaboration with mining firmst training train affected households in financial management. This will enable them to make the best use of the compensation received. The study also revealed that the nearby non-mining community was also affected by the operations of PMGL in terms of health and the high cost of foodstuff since the mining and resettled communities relied on them for foodstuffs which led to a hike in prices of food. The study recommends that farmers in nearby non-mining communities must be empowered financially by large-scale mining companies which will lead to an abundance of foodstuffs that can supply communities whose farmlands are affected by the activities of a mine.

8.3.3 Collaborative stakeholders' engagement to address any communication gap between indigenes and Government/company officials.

Various governmental agencies like the Ministry of Lands and Natural Resources, Lands Commission, Ministry of Employment, Environmental Protection Agency and Ministry of Food and Agriculture and host communities should collaborate before a mining concession is given to discuss possible adverse effects the activity of a mine might bring on host communities and provide practical and sustainable solutions. A collaboration between these stakeholders will ensure conflict resolution. Again, it is expected that these governmental agencies in delivering their duties of awarding mining concession to companies, will consider all interest parties, especially the host communities to eliminate the rifts that occur between the indigenes and the mining companies. The government and mining companies should establish functional client services unite with

prompt response timelines where the grievances of host communities would be addressed. This will ensure the timely resolution of complaints and grievances to avoid agitations and clashes between mining communities and mining companies. Periodic Stakeholder engagement should be encouraged to give way to interest groups debate on issues and express concerns to reach an agreement. Effective periodic stakeholder engagement will ensure a smooth and cordial relationship among stakeholders. This will reduce if not eliminate assumptions, rumours, conflicts and legal battles.

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APPENDICES

APPENDIX 1: QUANTITATIVE RESEARCH INSTRUMENTS

INSTITUTE OF STATISTICAL SOCIAL AND ECONOMIC RESEARCH

UNIVERSITY OF GHANA

LEGON

THE SOCIO-ECONOMIC IMPLICATIONS OF LARGE-SCALE

GOLD MINING ACTIVITIES ON LOCAL COMMUNITIES IN GHANA:

A CASE OF UPPER DENKYIRA WEST DISTRICT

My name is Mercy Ackah, a PhD (Development Studies) candidate at the Institute of Statistical, Social and Economic Research (ISSER), University of Ghana. I am researching on the above topic and, currently at the data collection stage. The data to be collected is strictly for academic purpose, but the analysis could shape the mining sector in the future for the development of mining communities. The broad objective of this study is to examine the livelihood outcomes (socially and economically) of large-scale gold mining on local communities. Specifically, the study questionnaire will help elicit the economic outcomes of mining activities on mining communities and nearby non-mining communities.

If you agree to partake in this study, you will be required to respond to questions. Each interview is not expected to exceed 1 hour. You are assured that your responses to various questions will be kept very confidential. In the main thesis, you will be anonymous, hence your voices, comments and opinions cannot be traced to you. Participation in this study is voluntary, hence you are not forced to take part in this study. Also, at any stage, if you feel like withdrawing from participation, you are free to do so.

Again, you may decline to answer questions asked if you are not comfortable. With your permission, I may call back with some follow up questions, only when you are willing to do so.

Thank you

HOUSEHOLD SURVEY QUESTIONNAIRE

Name of community……

Date……

Q1. How old are you?

(1) 30-40 [ ] (2) 41-50[ ] (3) 51-60 [ ] (4) > 60 years [ ]

Q2. Gender of respondent: 1. [ ] Male 0. [ ] Female

Q3. How long have you lived in this area?

1. Less than 1 year [ ] 2) 1-5yrs [ ] 3) 6 – 10yrs [ ] 4) 11-15yrs [ ]
5) 16 yrs and above [ ]

Q4. What is your highest level of educational attainment?

(0) [ ] None (1) [ ] Basic (2) [ ] Secondary (3) [ ] Tertiary

(4) Others: ……

Q5. What is the total number of people in your household? (Excluding visitors)…….

Q6. What are the major economic activities of the people of this community?

1. Agriculture [ ]
2. Trading [ ]
3. Mining [ ]
4. Hunting [ ]
5. Others ……..

Q7. Employment/ displacement

	a. Primary occupation before mining activity started	**b. Secondary occupation before mining activity started**	**a. Main occupation after mining activity started**	**b. Secondary Occupation after mining activity started**	**a. Current Employment**
1. Farmer					
2. Trader					
3. Public/civil servant					

4. large-scale gold mining					
5. Small scale mining					
Unemployed					
6. Others					

Q8. How long have you been engaged in your current employment after mining started?

…… ……..

Q9. What are the reasons for engaging in a secondary economic activity?

(1) Money from main source of work is not sufficient enough [ ]

(2) To be more productive with my spare time [ ]

(3) Others

(specify).....

Q10. Are you engaged in your current occupation because of the arrival of mining activities?

1) Yes [ ] 0) No [ ]

Q11. How many hours do you work daily in your

1. Primary occupation? ……..
2. Secondary occupation? ……..

Q12. How many members of your family are employed or engaged in income generating activity?.....

Q13a. Does any member of your household directly or indirectly work in the mines?

1. Yes [ ] 0) No [ ]

Q13b. If yes to **que (13),** how many members work

1. Directly?……
2. Indirectly?……...

Q14a. Has your place of abode been affected by the mining activities?

1. Yes [ ] 2. No [ ]

Q14b If yes, explain how it was affected

Q15. Were you compensated?

1. Yes [ ] 2.) No [ ]

If yes to question (15), answer question 16 to 19

Q16. What were you compensated with?

1. Money [ ]
2. Job [ ]
3. Agricultural land [ ]
4. Physical building and Agricultural land [ ]
5. Physical building & Money [ ]
6. Others……..

Q17. What did you use the compensation for?

Q18. Are you satisfied with your compensation?

1. Extremely dissatisfied [ ]
2. Dissatisfied [ ]
3. Moderately satisfied [ ]
4. Satisfied [ ]
5. Very satisfied [ ]

Q19. Do you consider yourself better off with the compensation?

1. Extremely worse off [ ]
2. Worse off [ ]
3. Moderately better off [ ]
4. Better off [ ]
5. Very better off [ ]

Q20a. Would you say that mining has enhanced the well-being of your household in general?

1. Yes [ ] 2.) No [ ]

Q20b. Please give reasons for your answer above.

INCOME

Q21. What were your other sources of income apart from above mention occupation before mining began in this area?

1. Social security benefits [ ]
2. Sale of farm produce [ ]
3. Off farm income (salary, petty trading etc) [ ]
4. Transfers [ ]
5. Remittances [ ]
6. Others ……

Q22. What are your sources of income after mining began in this area?

1. Social security benefits [ ]
2. Sale of farm produce [ ]
3. Off farm income (salary, petty trading etc) [ ]
4. Transfers [ ]
5. Remittances [ ]
6. Others

……

Q23. Annually, how much do you earn in your Primary and Secondary occupation from 2014 to 2018

	2014 (before Mining		2015 after		2016 after		2017 after	2018 after	
	Farming	Non-farming	Farming	Non-farming	Farming	Non-farming	Farming	Farming	Non-farming
Main earnings									
Secondary earnings									
Total									

Q24. What do you think accounts for your above response in question (25)?

LOSS OF FARMLANDS

Q25. Did you lose a farmland for mining activities?

1. Yes [ ] 0.) No [ ]

If yes to ques (25), answer question (26)

Q26. Size and state of farmland affected by mining activities

State of farmland affected by mining activities	**Tick appropriately**	**Size of farmland**
Land under cultivation		
Bare farmland		

Q27. Were you compensated for losing your farmland?

2. Yes [ ] 0. No [ ]

If yes to question 27, answer question 28 to 32

Q28. What were you compensated with?

1. Money [ ]
2. Job [ ]
3. Agricultural land [ ]
4. Physical building and Agricultural land [ ]
5. Physical building and Money [ ]
6. Others……

Q29. How was the compensation for your land valuated?

Q30. What did you use the compensation for?

Q31. Are you satisfied with your compensation?

1. Extremely dissatisfied

2. Dissatisfied
3. Moderately satisfied
4. Satisfied
5. Very satisfied

Q32. Are you better off with what you used the compensation for compared to your formal occupation?

1. Yes [ ] 0. No [ ]

Explain……

Q33a. Would you say that mining has enhanced the well-being of your household in general?

1. Extremely unenhanced
2. Unenhanced
3. Moderately enhanced
4. Enhanced
5. Very enhanced

Q33b. Please give reasons for your answer above.

FOOD SECURITY (Pre - mining activities)

Q34 a. If No to any question, skip to the next question

No	Question	Response Option
1	a) Before the Mining activity started in 2015, did you worry in any month that your household would not have enough food?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
2	a) Before the Mining activity started in 2015, were you worried in any month that you or any household member will not be able to eat the kinds of food you preferred because of lack of resources?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
3	a) Before the Mining activity started in 2015, did you or any household member eat just a few kinds of food (a limited variety of foods) day after day due to lack of resources?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)

4	a) Before the Mining activity started in 2015, did you or any household member eat food that you preferred not to eat because of a lack of resources to obtain other types of food?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
5	a) Before the Mining activity started in 2015, did you or any household member eat a smaller meal than you felt you needed because there was not enough food?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
6	a) Before the Mining activity started in 2015, did you or any household member eat fewer meals in a day because there was not enough food?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
7	a) Before the Mining activity started in 2015, was there ever no food at all in the household because there were not enough resources to get more?	1=Yes 0=No

	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
8	a) Before the Mining activity started in 2015, did you or any household member go to sleep hungry because there was not enough food?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
9	a) Before the Mining activity started in 2015, did you or any household member go a whole day without eating anything because there was not enough food?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)

Q34 b. (post mining activities) If No to any question, skip to the next question

No	**Question**	**Response Option**
1	a) In the past month, did you worry that your household would not have enough food?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice)

		2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
2	a) In the past month, were you or any household member not able to eat the kinds of food you preferred because of lack of resources?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
3	a) In the past month, did you or any household member eat just a few kinds of food (a limited variety of foods) day after day due to lack of resources?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
4	a) In the past month, did you or any household member eat food that you preferred not to eat because of a lack of resources to obtain other types of food?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
5	a) In the past month, did you or any household member eat a smaller meal than you felt you needed because there was not enough food?	1=Yes 0=No

	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
6	a) In the past month, did you or any household member eat fewer meals in a day because there was not enough food?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
7	a) In the past month, was there ever no food at all in the household because there were not enough resources to get more?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
8	a) In the past month, did you or any household member go sleep hungry because there was not enough food?	1=Yes 0=No
	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)
9	a) In the past month, did you or any household member go a whole day without eating anything because there was not enough food?	1=Yes 0=No

	b) If yes, how often did this happen?	1=Rarely (once or twice) 2=Sometimes (3 to 10 times) 3=Often (more than 10 times)

Q35. What is your assessment of the living conditions of the people in this community now and years ago (since 2014-2018)?

1. Better…… [ ]
2. Slightly better…… [ ]
3. No change…….. [ ]
4. Slightly worse…… [ ]
5. Worse …… [ ]

Q36. Rank the under-listed indicators (better off or worse off) in relation to before the mining activities and after mining activities

No.	Variables	Before mining activities started (a)		After mining activities started (b)	
		Rank		**Rank**	
		Better off	Worse off	Better off	Worse off
1	Provision of electricity				

2	Provision of drinking water				
3	Job opportunity				
4	Social amenities				
5	Peaceful environment				
6	Social vices				
7	Road access				
8	Cost of living				
9	Migration				
10	Diseases				

Q37. The presence of the mining company has brought the under-listed benefits to the community. Please indicate your agreement with the state of these services

	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)
a) Health					

1. Improved health services					
2. Higher number of clinics					
3. Increased specialized clinics such as Gynecology /Pediatric clinics					
b) **Infrastructure and social amenities**					
1. More schools have been built					
2. More salons/bars/shopping centers					
3. Increase in tradesmen in the area					
4. Improved roads					

5. Improved access to water					
c) **Social fabric**					
1. Increased number of police posts					
2. Reduced gender based violence					
3. Stronger and closer knit family set ups					
4. Reduced crime activities					
5. Reduced Immigration					
6. Reduced Social tension					
d) Employment					
1. Compensation of displacement					

2. Resettled to better areas					
3. Job creation					
4. Increased agriculture production					
5. Increased economic activities					
6. Scholarships					
e) **Environment**					
1. Reforestation					
2. Clean water					
3. Environmental protection					
4. No dust pollution					

Q38. The presence of mining activities has brought the under-listed challenges. Please indicate your agreement with the state of these services

	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)
a)Health					
1. Chest infections					
2. Headaches					
3. Disturbed sleep pattern					
4. Problems with food					
b) **Environment**					
1. Toxic water					
2. Dust					
3. Noise from mining activities					

4. Land degradation					
5. Cracks of buildings					
c) Social Cohesion and crime					
1. Increased crime level					
2. Increase of prostitutes in the area					
3. Increased abuse of drugs and alcohol					
4. Increased numbers of teenage					

pregnancies					
5. Social tension					
d) Employment					
1. loss of jobs					
2. Loss of farms lands					
3. Decreased agricultural Production					
4. Decreased economic activities					

Q39. Do you think that mining has any impact on agricultural production?

1. Yes [ ] 2. No [ ]

If yes, please explain

Q40. In your view, do you think your community is better or worse off with or without the mine?

1. Better off without mining

2. Better with mining
3. Worse off without mining
4. Worse off with mining

Please explain your response

Q41. How have people coped with the challenges resulting from mining in this community?

Q42. How effective have the coping strategies adopted been?

~End of Interview~

THANK YOU FOR YOUR TIME AND PARTICIPATION!

APPENDIX 2: COMMUNITY FOCUS GROUP DISCUSSION GUIDE

INSTITUTE OF STATISTICAL SOCIAL AND ECONOMIC RESEARCH

UNIVERSITY OF GHANA

LEGON

THE SOCIO-ECONOMIC IMPLICATIONS OF LARGE-SCALE GOLD MINING ACTIVITIES ON LOCAL COMMUNITIES IN GHANA: A CASE OF UPPER DENKYIRA WEST DISTRICT

My name is Mercy Ackah, a PhD (Development Studies) candidate at the Institute of Statistical, Social and Economic Research (ISSER), University of Ghana. I am researching on the above topic and, currently at the data collection stage. The data to be collected is strictly for academic purpose, but the analysis could shape the mining sector in the future for the development of mining communities. The broad objective of this study is to examine the livelihood outcomes (socially and economically) of large-scale gold mining on local communities. Specifically, the study questionnaire will help elicit the economic outcomes of mining activities on mining communities and nearby non-mining communities.

If you agree to partake in this study, you will be required to respond to questions. Each interview is not expected to exceed 1 hour. You are assured that your responses to various questions will be kept very confidential. In the main thesis, you will be anonymous, hence your voices, comments and opinions cannot be traced to you. Participation in this study is voluntary, hence you are not

forced to take part in this study. Also, at any stage, if you feel like withdrawing from participation, you are free to do so.

Again, you may decline to answer questions asked if you are not comfortable. With your permission, I may call back with some follow up questions, only when you are willing to do so.

Thank you

Q1. Could you please tell me what you know about the state of the community before the establishment of mining activities? With regards to:

1) Employment
2) occupation
3) Income levels
4) Health status
5) Security
6) Education
7) Infrastructure/social amenities
8) Environment status
9) Shelter
10) Food security
11) Social vices

Q2. Could you tell me the state of the above after Perseus mining commenced their activities?

Q3. To what extent has the mining activities affected the community positively or negatively?

Q4. How does the mining company relate to the local community?

Q5. Which institutional systems helped are helping to lessen the effects of mining in your community? **(Government, NGOs, CSOs, traditional leaders etc)**

Q6. Can you please tell me how and what they did or doing to help you?

Q7. How have people coped with the challenges resulting from mining in this community?

Q8. How effective have the coping strategies adopted been?

Q9. How do people perceive the future of the community with mining:

a: environmental

b: socio-cultural

c: economic/livelihoods

d: infrastructure/services

APPENDIX 3: KEY INFORMANT INTERVIEW GUIDE

INSTITUTE OF STATISTICAL SOCIAL AND ECONOMIC RESEARCH

UNIVERSITY OF GHANA

LEGON

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Again, you may decline to answer questions asked if you are not comfortable. With your permission, I may call back with some follow up questions, only when you are willing to do so.

Thank you

Name of respondent ……

Position of respondent ……

Q1. Can you tell me about the community before mining started (occupation, lifestyle of the people, the landscape and natural resources, main sources of livelihood, health, infrastructure, the environment, accommodation etc).

Q2. When and how mining activities began in this community? (Processes eg community engagement etc.)

Q3. What have been the major changes in the community with the coming of Perseus mining operations?

Q4. What is your view on mining in this community? Is it beneficial or not? Explain

Q5. What have been the greatest benefits and disadvantages of mining in the community?

Q6. What have been the greatest needs of the community and what has been done about it by the mining company?

Q7. Is the community better off in terms of the following as compared to before the commencement of mining activities:?

1. Employment
2. occupation
3. Income levels
4. Health status
5. Security
6. Education
7. Infrastructure/social amenities
8. Environment status
9. Shelter
10. Food security
11. Social vices

Q8. In your view, is the coming of mining a blessing or curse?

Please explain

Q9. What institutional support systems are available to help the community mitigate the negative effects of mining?

Q10. In what way have they been helpful?

Q11. How have people coped with the challenges resulting from mining in this community?

Q12. How effective have the coping strategies adopted been?

Q13. How do people perceive the future of the community with mining?

a: environmental

b: socio-cultural

c: economic/livelihoods

d: infrastructure/services

APPENDIX 4: INTERVIEW GUIDE FOR MINING COMPANY

INSTITUTE OF STATISTICAL SOCIAL AND ECONOMIC RESEARCH

UNIVERSITY OF GHANA

LEGON

THE SOCIO-ECONOMIC IMPLICATIONS OF LARGE-SCALE GOLD MINING ACTIVITIES ON LOCAL COMMUNITIES IN GHANA: A CASE OF UPPER DENKYIRA WEST DISTRICT

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If you agree to partake in this study, you will be required to respond to questions. Each interview is not expected to exceed 1 hour. You are assured that your responses to various questions will be kept very confidential. In the main thesis, you will be anonymous, hence your voices, comments and opinions cannot be traced to you. Participation in this study is voluntary, hence you are not

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Again, you may decline to answer questions asked if you are not comfortable. With your permission, I may call back with some follow up questions, only when you are willing to do so.

Thank you

Name of respondent …….

Position of respondent ……

Q1. Can you tell me a little about Perseus mining company limited and how it commenced their activities in this community?

Q2. Was there any community engagement? How was it done?

Q3. Are some community members employed at the mine? How many are they and what position are they occupying?

Q4. Who was responsible for the valuation process? Please take me through the process.

Q5. In your view, do you think the affected people have been fairly compensated? Please explain

Q6. What are some of the issues the community members have raised with the compensation packages given? Any resolutions?

Q7. What developmental projects the mining company has rendered to the community? ie infrastructure, scholarships, employment etc.

Q8. What are some of the negative effects the activities of your company has brought the community ie pollution, agriculture, health, loss of livelihoods, food security etc?

Q9. How best has your company tried to minimize such negative effects?

Q10. Has there been any conflict or confrontation between your company and the community members? How is the situation now?

Q11. As a company, what are some of the challenges you faced in this community?

Q12. Are you aware the presence of any institution supporting the communities? ie government, CSOs, etc.

Q13. How are the people in this community coping with effects the activities of your company on their livelihoods?