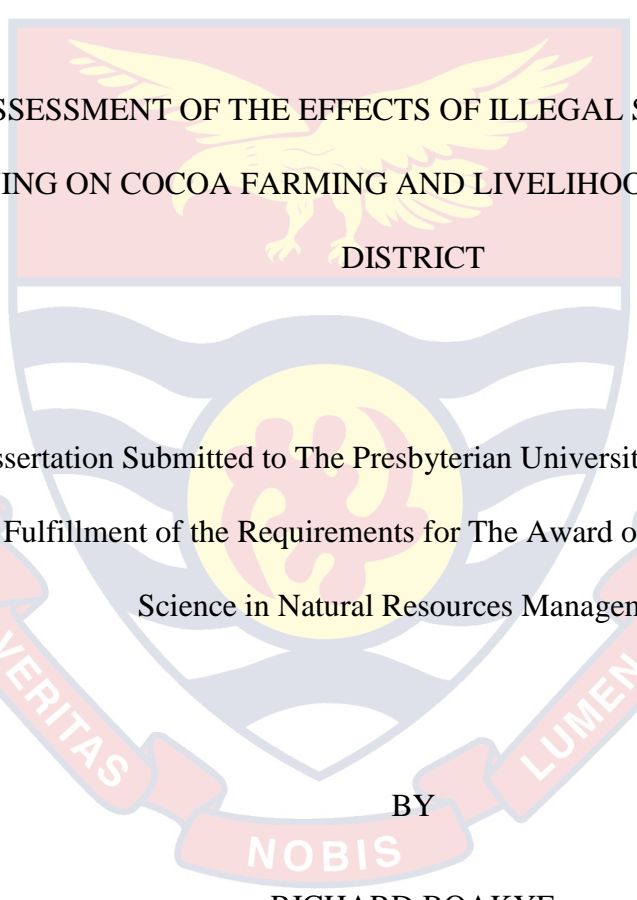


PRESBYTERIAN UNIVERSITY COLLEGE, GHANA

FACULTY OF DEVELOPMENT STUDIES

DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES

MANAGEMENT



ASSESSMENT OF THE EFFECTS OF ILLEGAL SMALL- SCALE  
MINING ON COCOA FARMING AND LIVELIHOOD BIRIM NORTH  
DISTRICT

A Dissertation Submitted to The Presbyterian University College, Ghana In  
Partial Fulfillment of the Requirements for The Award of Degree of Master of  
Science in Natural Resources Management

BY  
RICHARD BOAKYE

SEPTEMBER 2020

## DECLARATION

### Candidate's Declaration

*I, hereby declare that this Dissertation submitted to the Presbyterian University College, Ghana with the exception of references of other researchers which have been duly acknowledged, is the result of my own research and that this Dissertation has not been presented for a Degree in any other university.*

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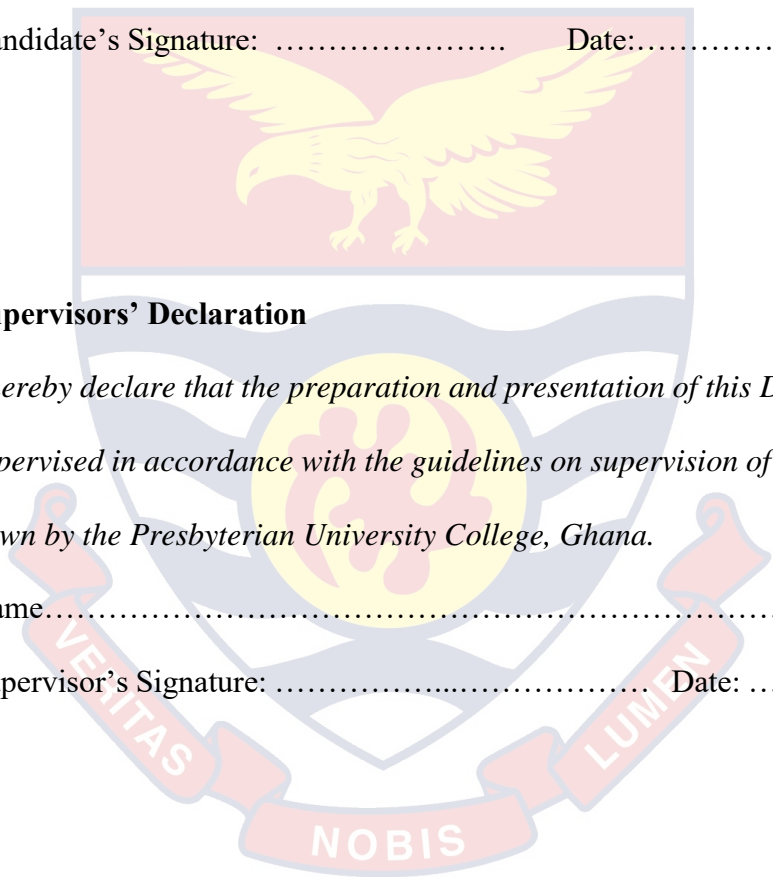
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### Supervisors' Declaration

*I hereby declare that the preparation and presentation of this Dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the Presbyterian University College, Ghana.*

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## ABSTRACT

The study examines how illegal small-scale mining has affected income generation of cocoa farmers, environment and land for cocoa farming and availability of labour for cocoa farming. Probability sampling was used to select four communities out of ten communities engaged in illegal mining. Purposive sampling and Simple random sampling were used to determine the sampling units and the target population of the study. The primary data for the study were sourced from site/farm visitation and questionnaires and interviews for selected cocoa farmers. A total of 120 respondents who were all farmers were randomly selected and structural questionnaires were administered to them in four selected communities namely, Noyem, Amenam, Nyafuman and Sakapiah. The data collected were subjected to descriptive analysis with the use of bar charts, pie charts and frequency distribution tables. Statistical software's including SPSS and excel sheets were also used to produce graphs and frequency distribution tables with all the data pre-coded before the analysis. The study revealed that 70% of males and 30% of females are engaged in cocoa farming with an age class of 36 – 50, representing 57% as majority actively involved in cocoa farming. From the study, it was observed that 93% were not willing to release their cocoa farms for small scale mining operations with only 7% willing to do so. Effective and efficient collaboration and policies between the government and the fringe mining communities should be formulated to eradicate illegal small-scale mining activities. The Ghana Cocoa Board should increase the price of a cocoa bag to discourage farmers releasing their cocoa farms for illegal mining and also to drive energetic and exuberant youth into the cocoa industry.

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## DEDICATION

To lovely my sons and daughters and my lovely wife.



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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

According to the International Monetary Fund (IMF) Ghana was one of the fastest-growing economies in the world in 2012 (IMF, 2013). Recent oil exploration has also discovered huge reserves of oil in the country; a discovery that will certainly aid in the development of the nation's economy. However, it is the production and export of cocoa beans that have historically been the most important source of income for Ghana and its people (Bresinger *et al.*, 2008). This growing and relatively prosperous country is the world's second-largest producer of cocoa (Mattyasovszky, 2015). Gold, cocoa production and individual remittances are major sources of foreign exchange for Ghana (Ministry of Foreign Affairs, 2015). Cocoa as a traditional crop has played a crucial role in generating foreign exchange earnings, government revenues, and household incomes (KPMG, 2014). According to the Ghana COCOBOD (2015), the crop generates about \$2 billion in foreign exchange annually for the country. Cocoa is Ghana's second leading foreign exchange earner (United Nations Economic Report, 2014). Cocoa farm sizes are relatively small ranging from 0.4 to 4.0 hectare with an estimated total cultivation area of about 1.45 million hectares (COCOBOD, 2015). It accounts for about 30 per cent of all revenue from export and responsible for about 57 per cent of overall agricultural export (Ghana Statistical Service, 2013).

Cocoa employs approximately 800,000 farm families spread over six of the 16 regions of Ghana (COCOBOD, 2015). Money from the cocoa sector has gone into the construction and maintenance of road infrastructure through the

Cocoa Roads Improvement Project. Money from the crop has been used in building health infrastructure in cocoa-growing areas and even in places like Kumasi and Accra. COCOBOD invests an estimated amount of 2 million cedi's annually in cocoa scholarship for relatives of cocoa farmers with about 2,500 beneficiaries accessing the scheme annually (COCOBOD, 2015). The role of cocoa in expanding economic activities in rural communities cannot also be overemphasized. Fears have been expressed by some Ghanaians that small scale mining in Ghana might be a resource curse rather than a blessing ((United Nations, 2015). Extensive literature exists on the illegal small-scale mining activities in Ghana and the negative impact it is having on agriculture specifically cocoa production and the livelihood of the cocoa farmers. However, this perceived negative impact should not be taken for granted because this has not been the story of other mining-rich African countries (Gavin, 2002). The question that may be asked; Is illegal mining in Ghana a threat or complement to the cocoa industry?

### **1.2 Statement of the Problem**

New Abirem is a district located in the Eastern region with two main economic activities namely mining and farming (Government of Ghana, 2013). However, there are other salaries workers mostly teachers, nurses and other civil servants in the district. Mining in the district is done on a both legal and illegal basis by Newmont mining company limited and illegal miners respectively. Due to the favourable climatic conditions, the area is also home to many smallholder cocoa farmers (Boateng *et al.*, 2014). The stakeholders in these two economic activities compete over two major resources; labour and land. There are indications that cocoa-growing regions in the country are under siege following

activities of illegal miners, particularly in the Eastern region (Akabzaa, 2010). Recent studies conducted in communities such as Noyem, Sakapiah, Amenam, Nyafuman and Nwinso suggests that some lands that were being used for cocoa production have now been lost to mining activities (Allman 1993; Ocansey 2013).

This accounts for the severe poverty hitting cocoa farmers and the subsequent practice where the majority of these farmers exchange their farms as concessions to gold miners for cash. This development has come about because indigenes in these communities are gradually losing interest in cocoa farming as they see the returns from mining activity as more attractive and far rewarding. Mining and agriculture may co-exist and interact to generate economic and social benefits, but at the same time, they compete for land, water resources and labour. On the one hand, the land is seized for mining that otherwise could be used for farming; labour is attracted away from agriculture into mining, and mining pollutes water needed for farm irrigation. On the other hand, mining generates money that supplements the income of labourers who branch out into mining, allowing them to improve their living standard and that of their families. (Hilson and Garforth 2012; 2013). Despite the importance of mining and agriculture to socio-economic development, the dynamics of their interaction have seldom received attention and are sometimes underestimated by scholars, governments, corporate entities and donors. There is a need for greater understanding of the mining–agriculture nexus to ensure that the two interact in a positive and balanced manner, producing social and economic development without disrupting the livelihoods of rural people whose lives are tied to cocoa farming.

### 1.3. Purpose of the Study

The purpose of the study is to identify whether cocoa farmers or owners legally release their cocoa farm lands for illegal small-scale mining and to assess the level of effects this small-scale mining has had of these peasant farmers and their environment.

### 1.4 Research Questions

The following research questions are considered in the quest to examine the impacts of the emergence of illegal small-scale gold mining on cocoa farming, the main source of rural livelihood in Birim North District in the Eastern region of Ghana.

1. How does illegal small-scale mining interplay with cocoa farming as the primary economic activity for people in the mining area?
2. What is the net effect of illegal small-scale mining on individual livelihood in the mining communities and the country as large?
3. Why would a cocoa farmer choose to do small-scale mining over farming cocoa?

### 1.5 Significance of the Study

Although small scale mining provides thousands indigenous people with employment and improves contributions to foreign exchange earnings in Ghana, however problems associated with this industry has intensified and cannot be overlooked. Studies have put less emphasis on the negative effect of small-scale mining activities and its impact on cocoa production. This has left discussion on effect of small-scale mining under speculations. This study fills the gap by providing evidence that small scale mining activities can have a negative effect on cocoa production. The study considered four communities in Birim North

District in the Eastern region of Ghana, and sought to investigate whether indeed the active operation of small-scale mining has an influence on cocoa production in the community. With that, four communities where small-scale mining activities are taking place were randomly selected. Interviews were conducted in these communities; namely, Noyem, Amenam, Nyafuman and Sakapiah. It is of important that the report of this study becomes very useful material for addressing issues pertaining to mining in cocoa farms.

### **1.6 Delimitations of the Study**

The study is not conducted on Assessing the effects of illegal small-scale mining on crop production or on Agriculture in general because for the past few years more cocoa farms have been turned into mining site specifically illegal small-scale mining. The district of about 78 communities (Birim North District), only four of the communities were randomly selected because not all the communities are the facing the problem of illegal small-scale mining on cocoa production. A population of twelve thousand five hundred and sixty-four, only one hundred and twenty respondents were randomly selected because not all the population involve in farming and due to the duration of the study only a few could be picked for the study. The study district (Birim North District) shares boundaries with other district such as Atiwa and Kwaebibirem districts of which similar research have been done and Kwahu West and Asante Akim South Municipal which are now gradually experiencing illegal small-scale mining.

### **1.7 Limitation of the Study**

Lack of quality historical data on cocoa production at district level was one of the limiting factors of the study. This emanates from poor data or record handling and also the unwillingness of authorities to release needed data. Lack

of data on small scale mining in the district was also a limiting factor. Also, the global COVID-19 Pandemic, which paved way for the partial lockdown was also a limiting factor because getting respondents was very difficult and time consuming.

### **1.8 Research Objective**

The main objective is to assess the effects of illegal mining on Cocoa Production, the environment and livelihoods of cocoa farmers in the Birim North District.

#### **Specific Objectives**

1. To estimate how small-scale mining has affected the income generation of cocoa farmers.
2. To evaluate the effect of small-scale mining on the environment and land for cocoa production activities.
3. To assess the effects of small-scale mining on the availability of labour for cocoa production.
4. To quantify the effect of small-scale mining on cocoa production

### **1.9 Organization of the Study**

The study consists of five chapters whose contents have been summarized as the follows.

Chapter One- This chapter deals with the introduction and background study of the thesis stating clearly the aims and objectives of the study, the research questions, the limitations of the study, the delimitation of the study and the significance of the study.

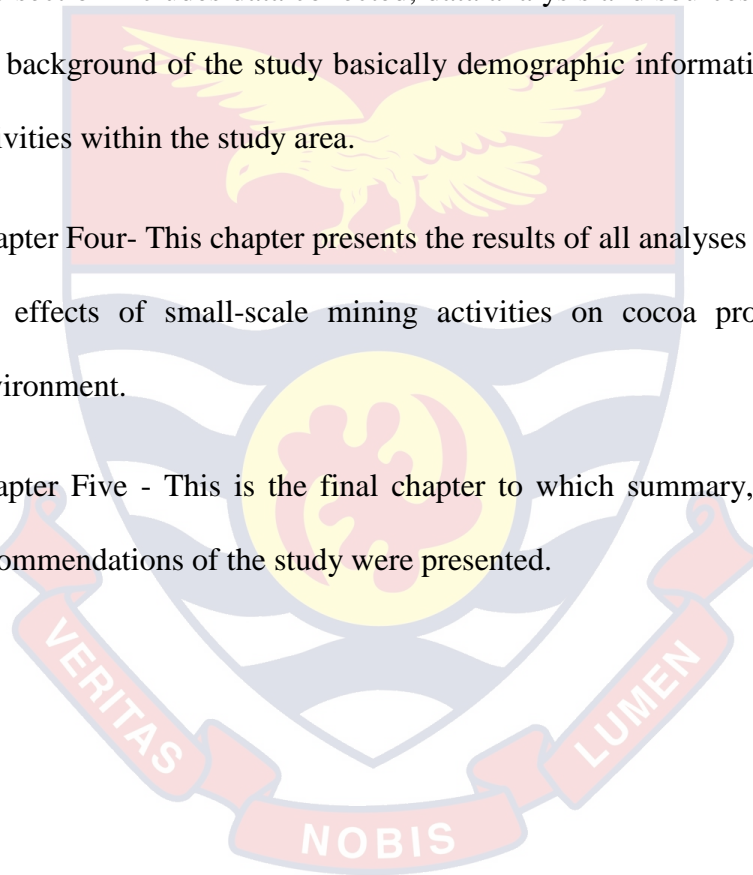


Chapters Two - This talk about the literature review and the theoretical concept underlining the socio-economic development of the mining sector from the global perspective and provide an overview of the mining in Ghana and discusses the link between mining and agriculture productivity within the related study.

Chapter Three- The chapter outlines the research design and methodology used. The section includes data collected, data analysis and sources. It also describes the background of the study basically demographic information and economic activities within the study area.

Chapter Four- This chapter presents the results of all analyses and discussion of the effects of small-scale mining activities on cocoa production and the environment.

Chapter Five - This is the final chapter to which summary, conclusions and recommendations of the study were presented.



## CHAPTER TWO

### REVIEW OF RELATED LITERATURE

#### 2.1 Introduction

This chapter deals with the theoretical concept underlining the socio-economic development of the mining sector from a global perspective and provides an overview of the mining in Ghana. It further discusses the link between mining and agriculture with review attempts to identify the various issues associated with illegal small-scale mining concerning its impacts on cocoa farming, the environment, and other socio-economic activities in the Ghanaian mining communities. This will help to identify how the mining operation directly or indirectly affects the socio-economic activities and the general living conditions of people living in the areas where illegal mining activities are rampant.

#### 2.2 Overview of Mineral Mining

Mining contributes towards human development and will continue to play a role in meeting the needs of societies. The rise in population growth and urbanization in China and other developing countries has granted high demands for minerals from individuals and emerging economies to improve living standards. Studies have regularly confirmed that when a per capita income in a country reaches US\$ 5,000-10,000 per year mineral demand increase quickly (Jenkins & Yakovleva, 2006). For instance, as populous China and India go through development there is an increase in demand for minerals (Jenkins & Yakovleva, 2006; Trends, 2001). The mineral gold is subtle which is very valuable. Aside, it has been used to make jewelry and serves the purpose of electronics since it can be shaped into a very fine wire and resistant to corrosion

(McAra, 1978). Minerals are also relevant to other services in contemporary society including education, health and wide range of associated consumer goods and service. Presently the trend of mining is gearing towards emerging countries whereas smelter and refinery production remains located in developed countries (Jenkins & Yakovleva, 2006). As demand for minerals increases human resource is challenged since there is the need to hire highly skilled employees because of the cyclical long- term at all times, even when markets slump and activities go down (Jenkins & Yakovleva, 2006).

Primarily gold mining is the economic drive for many countries since minerals are nonrenewable it is of great relevance that income generated is used to assist sustainable development. A well – managed mining industry can contribute largely to economic growth as a result of the creation of employment and business opportunities for inhabitants (Trends, 2001). Gold mining leads to tax exchange, foreign exchange and foreign direct investment. The existence of responsible gold mining companies in communities improves the health and education of the local people. Among the benefits mining may bring to a community, it also has negative impacts on the environment and society. Mining significantly affects directly or indirectly on the environment. Mining operations disturb water sources within mining communities and forest reserves and farmlands are also destroyed. Despite the undoubted importance, the mining sectors add to the growth of a country, governments play a major role in development through policies. There is a need to implement and strengthen policies in pursuit of sustainable development.

### 2.3 Mining in Africa

According to Yachir (1988), Africa is noted as the birthplace of mining activities, where the oldest mines were discovered in an iron ore site in Swaziland 45,000 years ago. Although traditionally gold was used as currency, it had diversified purpose in other places before extended to Africa (Yachir, 1988). The trend of mining activities in Africa has faced a tremendous change. After the twentieth century up to 1930s, mining activities were concentrated in the southern part of the continent except Ghana (gold) and Sierra Leon (Diamond). The search of minerals and slaves was no more the focus during the colonial era but rather land occupation, food production and more generally the recovery of large areas of influence by the Europeans (Yachir, 1988). During the twentieth century, the whole of the continent was under colonial repression except for Ethiopia. Mining had a considerable impact on domestic society by attracting an enormous amount of capital and increased labourer in the industry. The primary minerals mined before 1930 was gold and diamond, and it contributed to the rapid needs of the international monetary system. Amid 1930 several changes occurred; the exploration of the mining industry became intensive. Most countries began to discover their potential in other minerals, for instance, copper in Zambia, iron ore in Liberia, bauxite in Guinea and Uranium in Namibia and Niger. All these countries reached a high increase in their production. Other economies were compelled to rely on mining in order to meet the demand on the international market.

The continent is well enriched with mineral resources, as Africa is been recognized and rated by the US Geological Survey as the second largest world

reserves. There are 34 gold producing countries in Africa, though it has been recorded that 20 countries produce more than a ton

e per annum (US Geological Survey, 2011). The main producers of gold in African are Ghana, Tanzania, Mali, Guinea, whereas globally China, US, South Africa and Russia are identified as key players in the industry.

## 2.4 Mining in Ghana

The history of mining in Ghana has been well-reviewed and documented. In Africa, Ghana is noticed to have the oldest mining operation with large rich natural minerals deposits such as gold, diamond, bauxite and manganese. Small scale mining operations and the trade of gold previously was with Moors and the Phoenicians on the trans-Saharan route and predates the arrival of the Portuguese and other Europeans in 1471 (Aryee *et al.*, 2003). According to Ofose Mensah, the historian, the pre-colonial days gold deposits could be found on the surface in Asante, Denkyira, Akyem, Wassa almost all auriferous Akan states in Ghana. The accustomed tradition in these areas was that chiefs were entitled to one-third of gold won, so they sought to encourage the legitimate organisation of this operation (Anin, 1990). Because of this, small scale mining activities have been under the surveillance and control of chiefs. Although modern exploration and mining methods were introduced in 1870 by Pierre Bonnat Frenchman, the activities of small-scale mining continued. Method used for mining during that era were artisanal and processing where lode gold was mined by excavating pits into levels where dark colored stoned blocked with gold was reached (Aryee *et al.*, 2003). The gold was found by grinding the stone powder and the washing. In 1990 diverse form of legislation sought to ban the operation of small-scale mining and large-scale mining. This resulted in the dominance of English owed

large-scale mining operation in the field of mining in Ghana and nearly eliminating small scale mining (Aryee *et al.*, 2003). Before 1989 related output from activities of artisanal mining was regarded as illegal.

## **2.5 Major Mining Operations in Ghana**

Ghana is well endowed with mineral deposits and has considerably be a pillar of the Ghanaian economy over the years. Today, Ghana is the second largest gold producer after South Africa and the 9th largest producer in the world (Aryee, 2012). This advancement is as a result of liberal macroeconomic policies for mining and attractive legal fiscal institutional frameworks by government. These measures have attracted investment into the country at large towards the mining industry (Amponsah-Tawiah & Dartey-Baah, 2011). In Ghana, among the minerals mined gold, manganese, bauxite, and diamond are largely mined. Gold is one of the biggest contributors towards government revenue it has contributed 95% of the country's total mineral revenue (Aubynn, 2009). Notwithstanding the growth of the mining industry contributions towards the economy, in 2014, according to Ghana chamber of mines in the mining industry performance reports, gold expanded from 107.4 tonnes in 2013 to 108.2 in 2014 a margin lift of 0.7 per cent resulting in a small growth performance in the industry (Ghana Chamber of Mines, 2014). The mineral output in the country is largely funded by members of Ghana Chamber of Mines is the main industry association in Ghana.

## **2.6 Economic Importance of the Mining Sector**

The contributions of mining are varied across and within countries globally. In most case the presence of mining contributes to foreign direct investment and this is usually high among developing countries showing the

ability to attract investors in the mining sector (Stern, 1995). Other benefits include employment, export, GDP, government revenues and national investment. In Ghana, the mining industry is an important part of the economy especially gold. The sector directly contributed 38.8% of Ghana's corporate tax earnings, 27.6% to government revenues and 6% GDP in 2011 (Aryee, 2012). The industry also contributes to employment in Ghana, where 28,000 local people are hired in large-scale mining whereas 1,000,000 are involved in small scale mining (Aryee, 2012). In 2011 Ghana mining industry recorded the highest gold production of 3.6 million ounces. Small scale contributed 28% towards the total gold produced in 2011. The foreign direct investment amounted to \$11.5 billion from 1983 through to 2011 (Aryee, 2012). The trend of mining in Ghana by far has been progressive and granted economic support to the nation.

## **2.7 Causes of Small-Scale Mining**

This section discusses the various factors that encourage the practice of small-scale mining in Ghana. As already indicated, agriculture is the predominant occupation in the rural communities in Ghana. However, people engage in other economic activities such as basketry, fishing, animal rearing, charcoal burning, and other quick income-generating activities to supplement their incomes from farming. For those in the communities with mineral deposits, small scale mining operation represents their swift gratification source of income. As a result, employment is the principal motivation that gives rise to small-scale mining operation in Ghana. The persistent increase in the price of gold has incentivized people living in the legal mining areas to focus on galamsey activities as their primary source of livelihood (Citifmonline, 2014). While the legal mining sector employs only 30,000 people, an estimated number

of 170,000 people engage in small scale mining operation in Ghana (Samuel, Oladejo, & Adetunde, 2012). Often described as a poverty-driven activity, artisanal and small-scale mining is considered as a livelihood diversification strategy (World Bank, 2013).

The sector supplements agriculture as the source of living for the rural population in Senegal (Persaud, Telmer, Costa, & Moore, 2017). In Sierra Leone, lack of a viable source of living leaves the rural population with no choice but to resort to informal gold and diamond mining in the search for revenue and food security (Carier & Burge, 2011). Similarly, poverty is one of the factors that push individuals into galamsey in Ghana (Aidoo, 2016). The allegations that poverty pushes people to galamsey brings the argument that illegal small-scale mining cannot be eradicated without providing an alternative source of living for the illegal miners (Ghana Web, 2017). While some people engage in illegal small-scale mining because they do not have any other means to support their basic needs, others are motivated by greed and ‘get-rich-quick’ mentality (Ministry of Lands and Natural Resources, 2017). It is alleged that persons within authority such as the chiefs in the mining communities secretly promote galamsey due to the benefits that accrue to them (Abdulai, 2017). Much like some chiefs, customary owners and opinion leaders also take money to condone galamsey activities in their communities (Ministry of Lands and Natural Resources, 2017). Some politicians have also been reluctant to condemn illegal mining activities over the years because of political expediency (Aidoo, 2016). Another factor that encourages galamsey is the perceived complexity of licensing process (Ministry of Lands and Natural Resources, 2017; Hilson, 2012; Hilson & Potter, 2005). Though argued as a poverty-driven activity, the process



of acquiring a license for small-scale mining in Ghana is perceived to be expensive and reserved for only the wealthy people.

The poor in the mining communities who need the permit the most find it difficult to afford the costly process of acquiring the license because of poverty. Consequently, the bureaucracies coupled with the cost of seeking a license and other setbacks induce many small-scale gold miners to operate illegally (Bansah, 2017). Similarly, McQuilken and Hilson (2016) contest that centralized authority is a barrier to formalizing the small-scale mining in Ghana as the local authorities whose mandate is to support the prospective miners through the regulation process do not have the real power to do because the power is still vested in the high authorities, which further lengthens the process. Also, weak enforcement of rules and regulations by the relevant institutions is considered as a contributing factor to the surge in illegal mining activities in Ghana (Ministry of Lands and Natural Resources, 2017). Therefore, the relaxed and improper enforcement mining laws embolden many Ghanaians to connive with their Chinese accompaniments to expand their illegal mining activities (AgricInGhana Media, 2017; Fick, 2017).

## **2.8 The Importance of Small-Scale Mining in Ghana**

The existence and operation of small-scale artisanal mining is of great interest to the government of Ghana and Ghanaian's at large, since it contributes to the mineral exports and foreign exchange hence the legalization and regularization of the activities (Ofei-Aboagye, Thompson, Al-Hassan, Akabzaa, & Ayamdo, 2004). Small scale contributes to the total gold produced in Ghana and also as a form of job creation for the unemployed in the rural areas (Twerefou, Aryeetey, & Bafour, 2007). Small scale mining by artisanal means

formed the basis of the Ashanti Empire and facilitating the opening of Trans – Saharan route prior to European contact, gold mining largely contributed densely to large projects in Ghana. ASM also generates economic and social importance by contributing towards house hold income. Small scale mining has contributed towards the wealth creation and reducing poverty. It has promoted the provision of social and business to local communities. Largely the employment generated in this sector is rendered illegal, Appiah,1998 posits that the sectors provides about 20,000 Ghanaian job opportunity of whom majority are rural dwellers and 60,000 dependents on their existence of their livelihood (Appiah, 1998). Gold is widely mined because its deposits are found in one sixth of the country (Ofei-Aboagye *et al.*, 2004). Although the study focuses on small scale gold mining, the existence of other mined minerals such as salt and diamonds are defined in a certain part of the country and contributes towards national mineral production. According to EITI report 2014, ASM gold and diamond Exports in 2014 was about US \$ 2bn. It contributed an impressive 14.7% of the total Merchandise Export in 2014 (EITI, 2014).

## **2.9 The Role of Agriculture**

Generally, the agriculture sector role is multifaceted and contributes socially, environmentally and culturally. Agriculture basically aims at producing food and supply of raw materials and serves as a means of employment for livelihoods (FASDEP, 2007). Agriculture militates against poverty and contributes toward the GDP of a country. The sector boosts development and sustains the environment. Agriculture supports greatly during economic shocks within a country, in the case of Nigeria, in 1980's agriculture became an alternative livelihood for many displaced (FASDEP, 2007) also during

uncontrollable demonstrations and crisis it supports the local people. Agriculture has increased movement of population between sectors and contributed to rural-urban migration. Natural resources including water, forest, and land are altered by agriculture also poor farming practices degrades land leading to low productivity. The role of agriculture in a nation makes agriculture policy an essential portion of the national policy and its effective implementation generate growth and development.

### **2.10 Constraints in Agriculture**

The agriculture sector is faced by several contributing factors including lack of infrastructure, small scale mining, food insecurity and irrigation among other challenges. Considering the fact that major agriculture operations are undertaken in the rural areas and also long distance of farmlands in Ghana, transport service should be made available and adequate in order to easily move agricultural commodities and inputs. Limiting and inadequate transport infrastructure slow down productivity and deteriorate crop produced. Food insecurity also emerges as a form of constraints, although Ghana is may be considered as food secured pockets food insecurity occur in certain part of the country's population. Food insecurity is dominant in population density areas among women and children have specific dietary preference. Farmlands and vegetation's are destroyed as a result of illegal mining operation within a farming community. Water sources which could have helped irrigation are also polluted, in the long run agriculture productivity is limited. Many challenges face the agriculture sector therefore the need to strengthen agriculture policies is of relevance.

## 2.11 Agriculture and Mining

In Ghana gold mining operation are located in fertile agricultural and rural areas. The existence of mining and agriculture may co-exist and interact to generate economic and social benefits, but at the same time compete of natural resources including water, land and labour as industries they also rely on each other (Djurfeldt, Holmen, Jirstrom, & Larsson, 2005). Mining to an extent is associated with negative effect on agriculture including pollution, land grabbing and having a direct impact on rural income and living (Aragon & Rud, 2012). Despite the importance of mining and agriculture in socio- economic development there's a need for the two sectors to operate in a positive and balanced manner with disturbing the livelihood of rural inhabitants. Across Africa, agriculture is recognized as the most important economic sector employing high portions of labour market (Moomen & Dewan, 2015). However gold deposits and other rich minerals have greatly contributed towards the growth of the economies across Africa, for instance Ghana's GDP grew by 14.4% and Mozambique by 7.3% this growth was predominantly driven by investment (OECD, 2013). For the two key sectors to be appreciated there is a need to mitigate the negative consequences by maintaining a balance coherent policy frame work strategies must be adopted. Besides, the economic growth of these sectors rural – urban migration and all manner of migration in order to improve the living standard of local people.

## 2.12 Effects of Small-Scale Mining on Cocoa Farming

The issue of galamsey in Ghana has generated heated debates and discussions in the newspapers, radio, television, and the internet. Through the various platforms, different stakeholders have expressed different views on

galamsey operations in the country. People hold different frames about the incidence of illegal mining activities, which are usually associated with agriculture, society or the environment (Onumah, Leeuwis, Boamah, & Salifu, 2013). While some attribute positive reasons to the cause such as employment, farmers and other stakeholders in agriculture consider galamsey as a menace and a threat due to its effects on arable land, farm output and food security (Danyo & Osei-Bonsu, 2016). In fact, the Ghana Cocoa Board has been one of the major complainers of the menace of galamsey (Ghana Cocoa Board, 2017), in that galamsey creates factors that discourage or impact negatively on cocoa farming.

In the first place, galamsey presents pull factors as a more attractive investment. Some individuals are attracted to informal mining because they perceive that mining will offer them the opportunity to “get rich quick” (Hilson, 2012). That is, illegal mining comes with quick cash flow that attracts the communities (Aneani, Adu-Acheampong, & Sakyi-Dawson, 2017). In like manner, the prospect of getting “quick money” motivates some cocoa farmers to relinquish their farmlands for illegal gold mining. Cocoa farmers from the Wassa Amenfi East District in the Western Region of Ghana, for instance, maintain that cocoa does not provide them with much economic returns to match their time which makes them direct their focus to galamsey (MyjoyOnline.com, 2017). As at 2014, the illegal miners had invaded and destroyed between 1.5 and 1.7 million hectares of cocoa lands for mining (GhanaWeb, 2014). Apart from presenting money to incentivize farmers, galamsey impacts negatively on cocoa farming in other ways. Firstly, it affects cocoa farming by constraining the labor available to cocoa farmers (Aneani, Adu-Acheampong, & Sakyi-Dawson, 2017; Onumah, Leeuwis, Boamah, & Salifu, 2013). By interviewing 78 persons from

Wassa Akropong in the Western Region of Ghana, Onumah, Leeuwis, Boamah and Salifu (2013) find that galamsey decreases the availability of labor and increases the cost of laborers who are willing to be hired by the cocoa farmers.

This is because the illegal miners offer higher and attractive wages than the cocoa farmers, which results in a reduction in the supply of labor to the cocoa farmers. Consequently, the labor shortage compels cocoa farmers to increase their wage offering. Moreover, galamsey has adverse effects on the health of the cocoa trees which results in low yield. A study by Boateng, Codjoe and Ofori (2016) shows a negative impact of galamsey on cocoa farming in Atiwa District of Ghana. The farmers who have their cocoa farms close to the mining areas observe early dropping of immature pods, wilting and yellowing of leaves because the galamsey activities deplete the topsoil which supports the healthy growth of plants (Aneani, Adu-Acheampong, & Sakyi-Dawson, 2017). Other destructive activities that galamsey imposes on cocoa farms close to the mining sites are the creation of open tunnels and flooding of farmlands (Onumah, Leeuwis, Boamah, & Salifu, 2013).

### **2.13 The Influence of Small-Scale Mining on the Environment**

As already explained, small-scale mining provides livelihood opportunities for the rural population in developing countries, but its effects on the environment have also been well documented (Persaud, Telmer, Costa, & Moore, 2017; Kitula, 2006; Hilson, 2002). It is usually challenging to improve the environmental impacts of the artisanal and small-scale mining due to the absence of regulation and formalization of their activities (Hentschel, Hruschka, & Priester, 2003). The damaging environmental impacts associated with the unregulated mining activities include effluent dumping, unrehabilitated

excavations, improperly stored waste, dust emissions, deforestation, acid mine, river siltation and the release of chemicals such as cyanide and mercury (Eftimie, *et al.*, 2012). According to Kitula (2006), environmental pollution is the major problem resulting from informal mining activities in the Geita District of Tanzania. The disposal of mine waste contaminates the air and the water bodies, which imposes dangers on the human health, livestock and wildlife biodiversity. In addition to deforming the landscape with trenches in Senegal, the artisanal small-scale mining has polluted the water bodies with mercury (National Geographic, 2017). Similarly, the repercussions of galamsey in Ghana are mostly realized from mercury pollution and land degradation (Hilson, 2002). Schueler, Kuemmerle, and Schröder (2011) use Landsat satellite images to examine the land cover changes in Ghana and found that surface mining results to 58% deforestation and 45% loss of farmlands within the mining concessions.

#### **2.14 Mining and Health**

Despite the benefits mining operations adds to the people in mining communities the negative effects of health are immeasurable. Mineral deposits in the soil does not guarantee the wealth of miners (Conant & Fadem, 2008). The nature of mining operation is to exploit therefore it exploits not only the land but rather the human resource involved. The earth is mined for minerals all forms of mining is threatening, there is effect on the human health in both large- and small-scale mining. Understanding the long-term implication of on the well-being of miners will help improve and mitigate the harm associated with mining. World Health Organization defines health as a state of complete physical, mental and social well- being and not merely the absence or of the disease infirmity

(WHO, 1946). This definition indicates how productive one will be if one is physically fit.

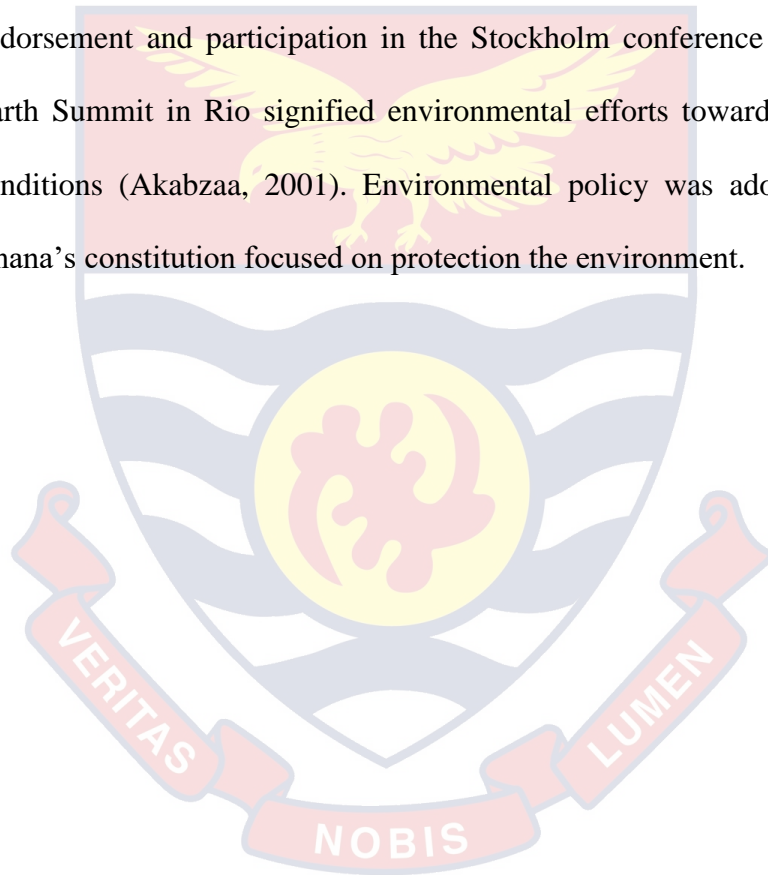
Health matters related to mining can be very sickening, the activities of mining mostly cause fire outbreak, explosion or collapse of buildings and mine tunnels. Miners usually get poisoned as a result of inhaling of dust, this causes the disease black lung causing sever breathing problem usually underground miners separating minerals from the rocks mostly women and children are mostly involved in this section of mining and it exposes them to these diseases. Chemical spills and heavy metals in the long-term lead to death. Again, heavy lifting, use of vibrating machines can affect the nerves and blood circulation. Working in a very hot environment without water can cause stress (Conant & Fadem, 2008). Children used for mining also have a high chance of getting affected from the dust from the mines.

### **2.15 Mining and Land Degradation**

Land degradation has a long- term loss on ecosystem and over burden the land surface. Land degradation also directly affect losses of soil, organic carbon nutrients and regulation and indirectly affects loss of productivity and wildlife habitat. Threats to sustainable development posed by land degradation has been considered by 1992 Earth Summit and the 2002 World Summit on Sustainable Development however response has been crippled (Herzog & Lausch, 2001). Activities of mining and its consequents is recorded as degrading to the land and other resources significantly. The excessive removal from the mine area accounts to the reduced rain forest and rich top soil for cultivation also among mining operations blasting or sophisticated machines results in destruction and generating of waste (Sahu & Dash, 2011).



In Ghana most lands are classified as poor fertility and are subject to degradation factors influencing the degradation includes population, increased urbanization and climate change (Economy wide & Assessment, 2007). These causes reflect in crop production that contributes to soil erosion, overgrazing, pollution, and dissipation from deforestation (Economy wide & Assessment, 2007). To sustain and restore crop production proper soil management and other natural policies should be enrolled to protect and preserve development. Ghana's endorsement and participation in the Stockholm conference in 1972 and the Earth Summit in Rio signified environmental efforts toward sustained living conditions (Akabzaa, 2001). Environmental policy was adopted in 1995 in Ghana's constitution focused on protection the environment.



## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

This chapter explains the methodology used or applied in the study, the study area and its socioeconomic features, the data collection techniques and methods used in the discussions. Analytical models were used to determine the mining impacts of mining on agriculture in the study area. The data collection techniques included sampling methods, research questionnaire design and administration as well as primary and secondary data. Statistical tools were used in the analysis of the data collected.

#### 3.2 The Study Area

The Birim North District is one of the districts in the Eastern Region of Ghana which was created in 1988 and is classified by the Ministry of Local Government and Rural Development as deprived based on the infrastructural development and social amenities in the area. The district economy is mostly agrarian and like a normal deprived district, agriculture is in the hands of peasant farmers who still depend on rudimentary methods for production. It has an ecologically balanced semi-deciduous forest reserve (District Profile Plan, 2004, 2010). The district is however endowed with a variety of resources which include the following;

1. Gold and other mineral deposits at New Abirem, Ajenjua Bepo, Yayaso, Hweakwae etc.
2. Vast Forest Reserves (about 475.63km square) stocked with timber and other forest products.
3. Large quantities of Clay and Sand deposits.

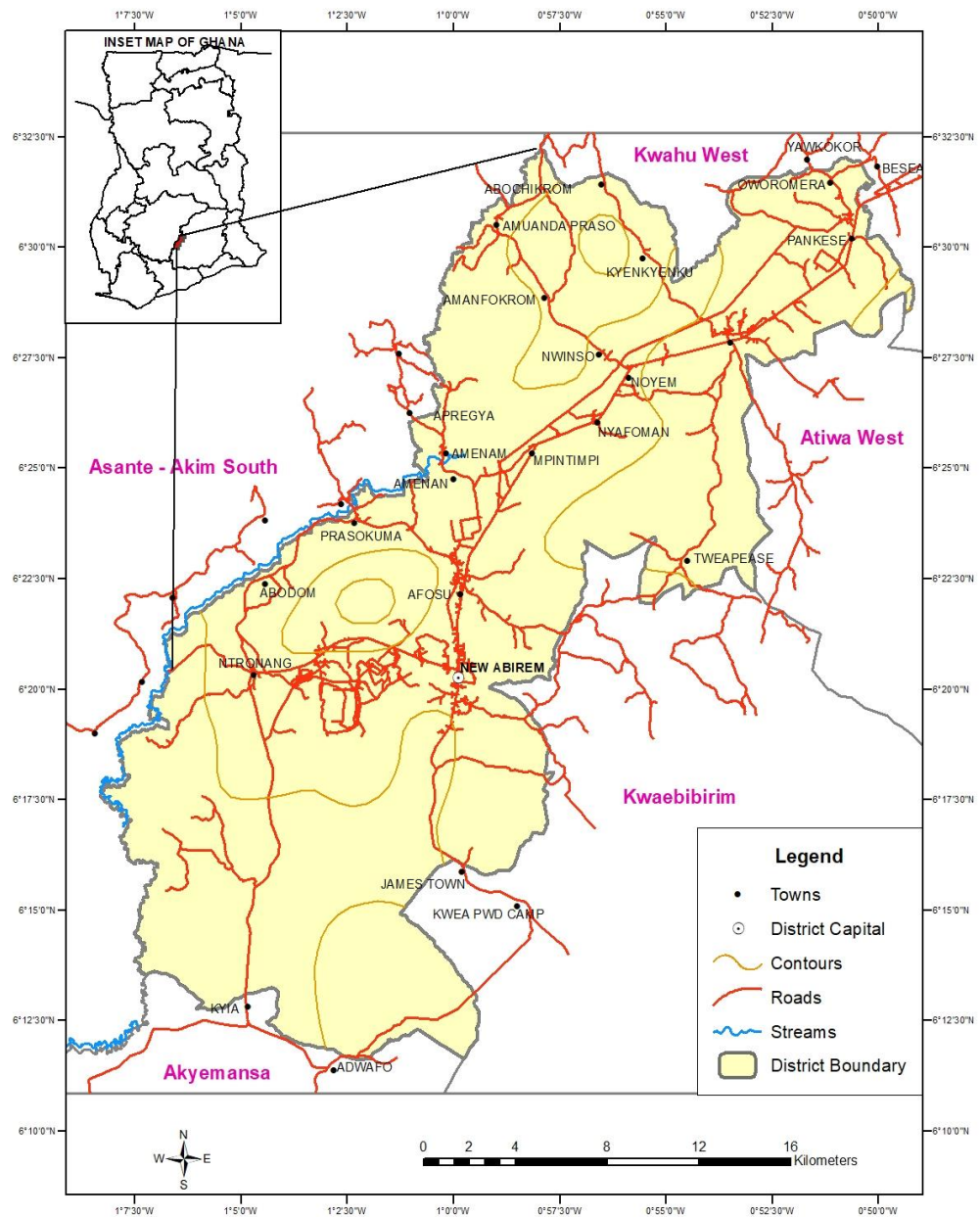
4. Good soil of high agricultural value.

### **3.2.1 Location and Population Size**

The Birim North District which is in the Eastern Region occupies an area of about 550 square kilometres (Figure 3.1). It has 78 settlements within its jurisdiction. The district is located between latitudes. It shares boundaries with Asante Akim South and Adansi South Municipalities in the west and Kwahu West Municipal in the north, to the south by Akyemansa District and to the east with Atiwa and Kwaebibirem Districts as seen in figure 3.1.

### **3.2.2 Geology and Minerals**

This physiographic district is underlain by Precambrian rocks of Birimian and Dahomeyan formations. The Birimian formations are known to be the gold-bearing rocks. There are reported cases of gold deposits, at Ajenjua Bepo, Ntronang, Afosu, Adausena, New Abirem, Yayaso and Hweakwae communities. There is also a widespread deposit of sand and clay; sand at Noyem, Nyafuman, New Abirem and Pankese and clay at Ntronang and Yayaso. There is also a high deposit of limestone at Birim. There are rounded outcrops of granite found over the Birimian rocks at New Abirim, Nyafuman, Noyem and Ajenjua Bepo. These rocks have a high potential for iron and bauxite (DDP, 2002).



**Figure 3.1: The Map of Birim North District**

### 3.2.3 Climate and Vegetation

The district lies within the wet semi-equatorial zone marked by double rainfall maxima with a mean annual rainfall between 125cm and 200cm. The first rainy season is from May to July and the second rainy season is from September to October when the district comes under the influence of the Wet Maritime Airmass. There is a sharp dry season between the two rainy seasons

the main one coming between November and March when the tropical continental Air mass in the country sweep over the area (DDP, 2002). The relative humidity is generally high ranging between 75% to 80% during the two rainy seasons and 70% to 80% during the rest of the year. The district has a moist semi-deciduous forest. Human activities notably farming, lumbering and occasional bush fires have however disturbed this vegetation. There are, however, nine large areas of forest reserves which include Nsuena Forest Reserve, Kwekaro Forest Reserve, Ajenjua Bepo Forest Reserve, Mamang River Forest Reserves, Agyenuapepo Forest Reserves. These forest reserves together cover a total of about 475.6 square kilometers representing 30% of the entire land surface area of the district (DDP, 2002).

### **3.2.4 Migration**

About 54% of the people in the district are migrants while the Ayem, the indigenes constitute only 28 percent of the population (DPP, 2004). These immigrants had however stayed in the district since time immemorial and hence do identify with the area and with development activities but out-migration is not prominent in the district (DPP, 2004). The gross out-migration rate is about 35 people per 1000 (DPP, 2010). With the advent of Newmont Gold Ghana Limited, migration pattern and rate have change.

### **3.2.5 Income and Poverty Levels**

The predominant economic activity in the District is subsistence agriculture (mostly farming) which engages 73.5% of the economically active labour force. Other professionals outside of this occupation engaged in agriculture as a minor activity. The population in commerce and services forms about 15.2% and 3.8 % of the labour force respectively. The average monthly

income for the agricultural sector in the District is about GH¢115.90 (DPP, 2004). Crop farming constitutes the major source of income in the district and accounts for about 50% of all incomes. This is followed by wages and salaries which is 15%, business and trading 15%, small scale industry 8.5%, livestock farming 6%, pension, rents and remittances 3.5%, and others 2%. The leading area of household spending is on food which represents 55%, followed by energy 15%, transport 11%, education 9%, health 5%, funerals 3% and housing 2% (DPP, 2002 & 2004).

The Ghana Living Standard Survey, (2005) puts the expenditure on food at 69%. Expenditure on food in the district, therefore, falls below the national average. This could be attributed to the fact that it is a food crop growing area and almost all the farmers concentrate on subsistence agriculture. Generally, the standard of living of the people is low. About 50% of the people live below the poverty line. The people's access to basic facilities and services is limited, and this account for their inability to contribute meaningfully to development. The people earn very little and cannot therefore save to build capital for development (GLSS, 2009).

### **3.3 Research Design**

This area discussed how data for the study were collected and analysed. These included the data collection through questionnaire administration, sampling methods and frame and data analysis. The study is mainly qualitative research. According to Glossary of Marketing (2011), as cited in Lichtman (2017), qualitative research refers to research which is based on finding the opinions and attitudes of the study participants rather than any significantly measurable data. A qualitative inquiry helps in the study to understand from the

perspectives of the cocoa farmers with regards to how the illegal mining activities affect cocoa farming, the environment, employment (farm labour) and the livelihood on cocoa farmers. The study made use of both primary and secondary data.

### **3.4 Data collection**

Data collection techniques adapted allows the researcher to systematically collect information about the study for instance the people, object, phenomena and the settings in which they occur (Chaleunvong, 2013). Secondary data and specialized data method served as a supplement in the study.

#### **3.4.1 Primary data**

The primary data source is a source in which the data is collected firsthand by the researcher for a specific research purpose (Persaud, 2012). The primary data were derived from interviewing key individuals through structured questionnaires administration and field observations.

#### **3.4.2 Secondary data**

The secondary data refers to the use of pre-existing data for a particular topic (Hanson, 2012). The secondary data were sourced from books, dissertations, journals, correspondence, relevant information from the ministry of food and agriculture, Ghana cocoa board, the mining companies, the chamber of mines, and the district assembly to extract information and statistics for the study.

### **3.5 Questionnaire Design and Administration**

Close type questionnaires were used in conducting the study. It was categorized into three sections, focusing on the socio-demographic features, the

socio-economic impacts and the general impacts of mining activities on cocoa production and the environment. The researcher used questionnaires because it helped the respondents given specific and direct answers to the questions asked. Before the questionnaire administration, a focus group discussion was undertaken to explain the purpose of the study and the questionnaire to them. Respondents who could read were given the questions to answer while those who could not read and write were interviewed. Pre-testing of the questionnaire was done at Noyem to help the researcher fine-tune the questions and improve on the skills of the questionnaire administrators to have reliable and efficient data.

### **3.6 Sampling Method and Techniques**

The population of the district with about 78 communities as given by the Ghana Statistical Services was 78,907 as at the year 2010. Probability sampling will be used to select four communities for the study. This was to allow for equal participation of all the 10 communities covered by the mining activities for the survey and also to avoid biases by the researcher. Since it was impossible to deal with the entire population within the four study areas due to resource, budgetary and time constraints, a representative sample size of 120 will be selected for the survey. The advantage of choosing a representative sample size is that it enables models to behave well as a result of a large degree of freedom (Sarantakos, 1997). The target population for this study were the cocoa farmers as the sampling units of the study area. Purposive sampling was used to determine the sampling units and the target population of the study. This was used because of the nature of the research objectives as it focused on cocoa farmers. Simple random sampling was additionally used to select the farmers for the survey.



Simple random sampling was used to ensure that every farmer stands the chance of being selected for the study. This also allowed for a maximum selection of both male and female cocoa farmers.

Questionnaires were administered in four (4) communities namely; Noyem, Amenam, Nyafuman and Sakapiah selected within the Birim North District (Figure 3.2).

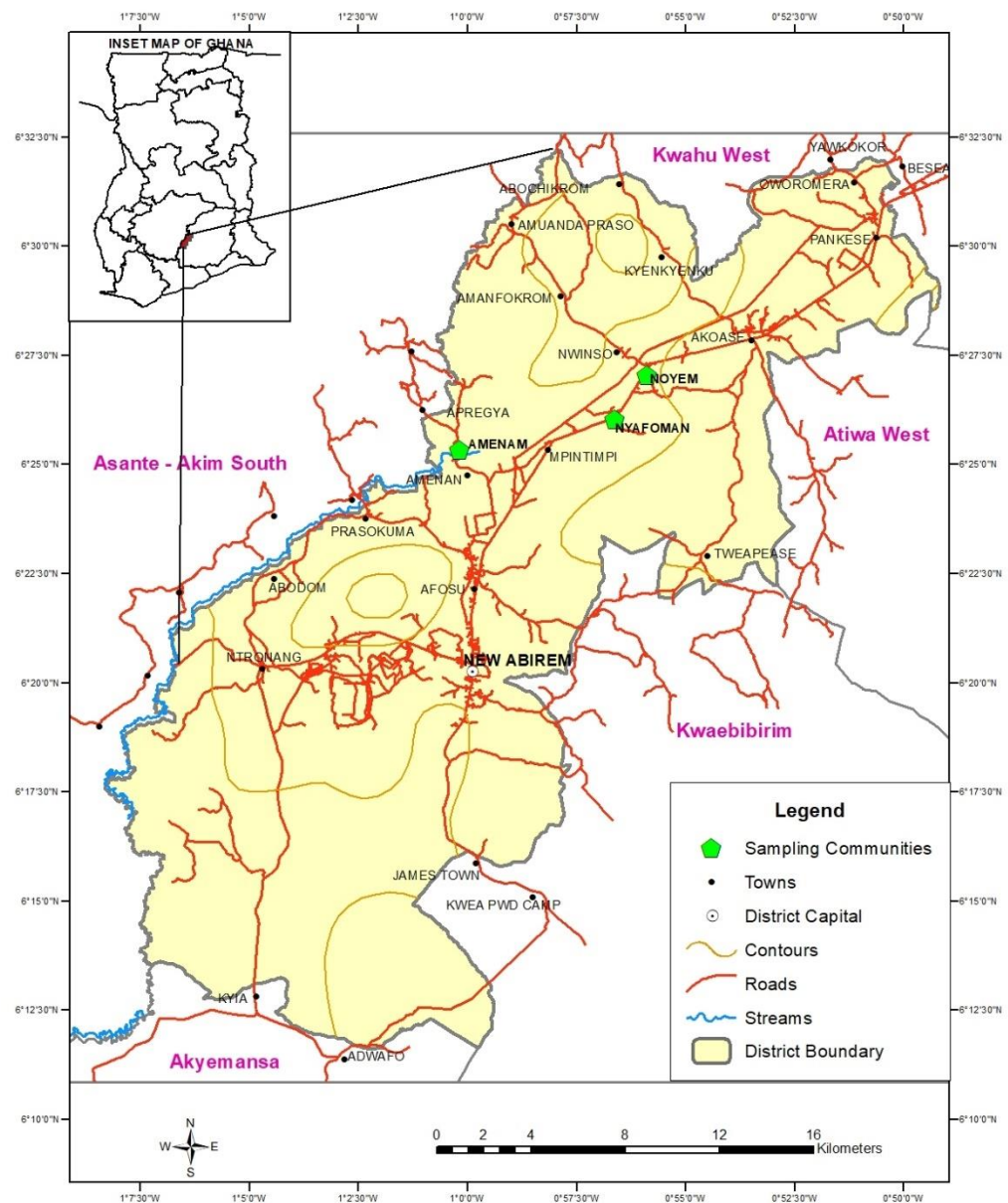


Figure 3.2: Map of Birim North Showing Sampling Communities

All these communities are actively engaged in mining and farming and were randomly selected. For this study, 120 respondents who were all cocoa farmers were randomly selected and structured questionnaires were administered to them in all the selected communities as in Table 3.1

**Table 3.1: The Study Area, Population and Sample Size Distribution**

Community	Population	Sample Size Selected
Noyem	2852	20
Amenam	3644	40
Nyafuman	3486	40
Sakapiah	2582	20
Total	12564	120

Source: Field Survey (2020)

### 3.7 Data Analysis

The study employed descriptive analysis and graphical analysis with the use of pie charts and frequency distribution tables as techniques to analyze the data gathered. Descriptive analysis is a tool used in descriptive statistics. It is used to provide simple summaries about the observations made in the analysis such as percentages. It is commonly used in analyzing interview transcript and responses to open-ended questionnaire items (Julien, 2012) data and make sense or out of which meaning is derived. In this study, the qualitative responses from the open-ended questions and the interview script were categorized into conceptual categories to identify the consistent patterns and the relationship between the themes. The results were then summarized using graphs and charts.

### 3.8 Research Limitations

1. This research faced cost and time constraints especially with the global issue of COVID -19 Pandemic. The research was expected to be completed within a few months but many months were used due to lockdown and other restrictions issued by the president of the Republic of Ghana. In effect, not including more mining communities in the Eastern Region makes it less reliable to generalize results from the study to the whole region. However, the results were representative of the four communities where the sample size was taken.
2. The landowners responded that they have never sold their lands for galamsey but some abandoned mining pits were seen around. This implies that some of the respondents may have withheld information about their personal experiences with galamsey which is usually the case when participants are being asked to answer questions about an illegal issue or a criminal act (Bleek, 1987).

### 3.6 Ethical Considerations

1. The study observed voluntary participation. Participation was purely voluntary as the participants had the free will to decide whether to participate in the research activities.
2. The questionnaires and the interviews questions were asked in English, but due to the low level of English literacy among the cocoa farmers, data was recorded in a Ghanaian local language, Twi and transcribed into English.

## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

#### 4.1 Introduction

This part of the study focuses on presenting results collected from Birim North District of Ghana. The data for the research was gathered from sixty respondents using questionnaires and semi-structured interview questions. The respondents were cocoa farmers in rural mining communities. The chapter first highlights the demographic characteristics of the research participants, followed by answers to the four main research questions and ends with a discussion and summary of results.

#### 4.2 Demographic Characteristics of Respondents

A total of sixty (120) respondents participated in the study of which 70% were males and the remaining 30% were females. As seen in the table 4.1.

**Table 4.1 Sex Distribution of the Respondents**

Name of Community	Number of Males	Number of Females
Noyem	14	6
Amenam	28	12
Nyafuman	28	12
Sakapiah	14	6
Total	84	36

Source: Field Survey (2020)

With respect to the age distribution, the most extensive category of responses fell within 36-50 years which represented 57% of the total responses. Twenty-seven respondents representing 22% of the total responses were above

50 years, 17% were within 26 - 35 years whereas 4% were between the ages of 18 – 25 and no farmer was below 18 years as seen in the Table 4.2.

**Table 4.2: Age Category of Respondents Involved in Cocoa Farming**

Age category of Respondents	Percentage
18 – 25yrs	4
26 – 35yrs	17
36 – 50yrs	22
Above 50yrs	57
Total	100

**Source: Field Survey (2020)**

A percentage of 35 of the respondents have a junior high school education, with 30% of the respondents who have had primary education. 10% of the total respondents had gone through senior secondary school with 5% having gone through tertiary education. However, a number of 24 respondents representing 20% had no formal education as seen in Table 4.3 below.

**Table 4.3: The Educational Status of Respondents Involved in Cocoa Farming**

Educational Status of Respondents	Percentage
No Formal Education	20
Primary School	30
Junior High School	35
Secondary School	10
Tertiary School	5
Total	100

**Source: Field Survey (2020)**

The study revealed participants ownership statuses of cocoa farms as following; 51 respondents representing 43% were farm owners, 36 respondents representing 30% were tenant farmers, 22 respondents representing 18% occupied family land and 11 respondents representing 9% were other forms of leasehold ownership as seen in Table 4.4.

**Table 4.4. Respondents’ Ownership Status of Cocoa Farm**

Ownership Status of Respondents	Percentage
Farm Owner	43
Tenant Farmer	30
Family Land	18
Other Forms	9
Total	100

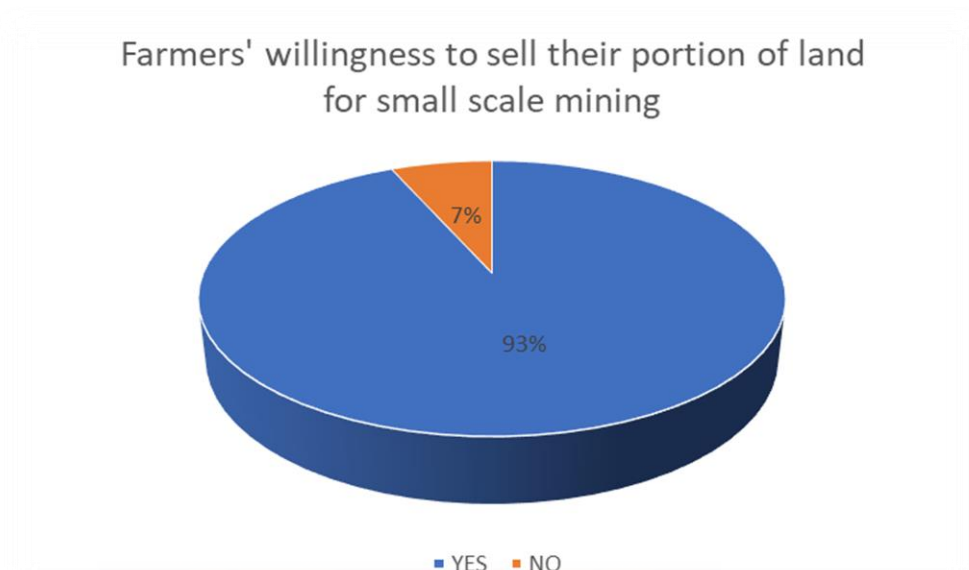
**Source: Field Survey (2020)**

From the above, 43% of the respondents were farm owners who either work directly on the farm with support from farm laborers. 30% of the responses came from tenant farmers who work on the farm as crop sharing. 18% work on family lands with the remaining 9% as others such as leased farms where one acquires a temporary right to own a particular cocoa farm for a specified number of years. From the previous discussion it could be seen that the majority of respondents between 36-50, had junior high school education and own their own farms. Irrespective of the ownership status, almost all the participants (90%), depend on cocoa farming as their main source of living. About 96% of the participants from each cocoa farming household are the breadwinners of their

families with an average of 6 dependents. This means that any negative impact of illegal small-scale mining (galamsey) on a cocoa farm is likely to have a corresponding effect on the lives of about six people. The remaining 10% directly depend on cocoa farming as secondary source of income with their primary source of income directly coming from teaching and trading with 3% and 7% respectively. With knowledge on illegal mining (Galamsey), 112 of the total respondents representing 93% acknowledged of having knowledge on illegal mining whereas 8 respondents covering 7% denied having knowledge on it. One hundred and three respondents making a percentage of 86% acknowledged the fact that there has been a tremendous increase with respect to illegal small scale mining (Galamsey) activities within the communities in the past 5 years whereas 17 respondents (14%) denied that there has been no increased on illegal small scale mining (Galamsey) for the past 5 years.

#### **4.2 Responses to The Research Questions**

Farmers willingness to sell portion of their farmlands for Small-scale mining activities. About 112 respondents representing 93% were not willing to sell their portion of farmlands for galamsey activities where 8 respondents representing 7% were willingly to do so as seen in Figure 4.1 below



**Figure 4.1: Farmers Willingness to Sell Their Farmlands for Small Scale Mining Activities**

**Source: Field Survey (2020)**

Reasons why farmers will not prefer to sell their farmlands for small scale mining activities. Respondents cited numerous reasons for not selling their farmlands for small scale mining activities. 30 respondents representing 25% gave a reason as small scale mining activities create dead holes within the farmland which cause lives of peasant cocoa farmers, 44 respondents representing 37% suggested that small scale mining destroy water bodies available and 40 respondents representing 33% mentioned that small scale mining releases harmful chemicals to the soil which affects land productivity. However, 6 respondents representing 5% did not give any reason at all. This is further explained in terms of percentages in Table 4.5



**Table 4.5: Reasons Why Farmers Will Not Prefer To Sell Their Farmlands For Small Scale Mining Activities**

Reasons why farmers will not sell their cocoa farms	Percentage
Small scale mining activities create dead holes within cause lives of peasant cocoa farmers	25
Small scale mining destroys water bodies available	37
Small scale mining releases harmful chemicals to the soil which affects land productivity	33
No reason	5
Total	100

**Source: Field Survey (2020)**

Why will cocoa farmers prefer to sell their cocoa lands for Small-scale mining activities. Some of the respondents (35%) gave several reasons why some cocoa farmers will choose to sell their cocoa farms to pave way for the activities of small-scale mining, where as 95% said under no reason will compared them to do so. The following reasons were given out by the 42 respondents representing 35% who said they will give out their cocoa farms for small scale mining activities. Out of the 42 respondents, 6 respondents said small scale miners pays higher amount when they sell their cocoa farms to them, 12 respondents said their cocoa farms gave them poor yield as compare to their initial establishment, 24 respondents said price of cocoa bag is too cheap and 78 said no reason will allow them to sell their cocoa farm for the small scale miners as seen in the table 4.6 below.

**Table 4.6: Shows Reasons Why Cocoa Farmers Will Sell Their Cocoa Farms for Small Scale Mining Activities**

Reasons for Farmers Selling Their Cocoa Farms	Number of Respondents	Percentage
Small scale miners pay higher amount when they sell their cocoa farms to them	6	5
Cocoa farms gave them poor yield as compare to their initial establishment	12	10
Price of cocoa bag is too cheap	24	20
No reason will allow them to sell their cocoa farm for the small-scale miners	78	65
Total	120	100

**Source: Field Survey (2020)**

How does small scale mining (Galamsey) conflicts with cocoa farming as the primary economic activity for people in the mining area? Responding to how small-scale mining (galamsey) impacts or conflicts with cocoa farming in the mining communities in Birim North District, the participants elaborated on the issues of labor, land, and other benefits as well as challenges that they face in their farming activities due to the presence of small-scale mining (Galamsey). The responses are discussed as follows; The Impact of small-scale mining (Galamsey) on the Availability of Cocoa Lands. The participants were asked to indicate whether they have ever lost portion of their lands to small scale mining

(Galamsey). 55% of the total respondents confirmed that they have lost portion of their lands to small scale mining (Galamsey) whereas 45% said no. This can be seen in figure 4.2.



**Figure 4.2: Status of Farmers Who Have Lost Portion of Their Land to Small Scale**

**Source: Field Survey (2020)**

Per the 55% confirmation of respondents having lost their portion of lands to small scale mining (Galamsey), the small-scale mining (Galamsey) has posed problems to the availability of land for their cocoa farming. Some of the problems mentioned include unprecedented floods in cocoa farms due to galamsey activities. The uncovered mining pits collect water especially when it rains and flood the cocoa farms close to the mining sites. The floods in the farms prevent the farmers from carrying out any farming activities in the flooded parts of the farms as seen in the plate 1 in the appendix A. Another way in which galamsey destroys lands or cocoa farms is the construction of paths or roads through the cocoa farms. The galamsey operators usually construct roads through some of the cocoa farms to convey bulldozers and other mining

equipment to the designated mining sites. Majority of the responses showed that the miners typically ask from the relevant owners of the farms before the cocoa trees are plowed for the road, however, few said their consent are asked before. But at the end they get compensated whenever the small-scale mining operators create a path through their farms. However, 58% of the respondents who have encountered such situation in their farms said they were compensated but less than their expectations, whereas the remaining 42% said they were never compensated, as shown in the Table 4.7

**Table 4.7: Respondents’ Responses on Their Compensation**

Response from Respondents	Percentage
Were compensated but less than their expectation	58
Were never compensated	42
Total	100

**Source: Field Survey (2020)**

It was interesting to find that small scale mining operations in the rural mining communities have a positive side of improving access to farms and transportation. The paths created by the miners in some of the cocoa farms become accessible roads to ease movement of inputs to the farms and the transport of cocoa beans and other farm products. Three respondents expressed their views about the positive impact of galamsey operations in the community and said, “Galamsey also makes transportation easy. The roads created by galamsey operators help to transport cocoa easily. Nowadays, ‘motorcycles can move through our farms unlike first, where we had to carry loads on our heads’” as seen in plate 2 in the appendix A. How has illegal mining (Galamsey) affected availability of labor for farming operations. Respondents explained how

galamsey has negatively influenced labor available for cocoa farming which is similar to conclusions in the literature (Aneani, Adu-Acheampong, & Sakyi Dawson, 2017; Onumah, Leewis, Boamah, & Salifu, 2013). In Birim North District, 59 of the respondents, representing 49.2% said the presence of galamsey operations had constrained their access to labor for their farming activities. According to the farmers, the miners pay a relatively higher wage per day than the cocoa farmers. This has made the labour force not ready for any farming activities, and it has compelled farmers to also bid for higher prices for getting labour for their farming activities. Some of the farmers said even, if you employ labour for your farming activities, they do not take their time to work but rather do the work in a haste.

However, 50.8% of the respondents disagreed that the presence of galamsey operators in the mining communities does not affect the availability of labor to some farmers. They opening said, “as for labor, we get them to work. We have never had difficulty searching for labor. Table 4.8 shows percentages of labor availability for farming in galamsey sites.

**Table 4.8: Percentages of Labor Availability for Farming in Galamsey Sites**

Labor Availability	Number of Respondents	Percentage
Presence of galamsey operations had constrained their access to labor for their farming activities	59	49.2
Disagreed that presence of galamsey operations has affected availability of labor to farming activities	61	50.8

**Source: Field Survey (2020)**

**Impact of Illegal Mining (Galamsey) On Cocoa Productivity**

The study revealed that illegal mining has a direct effect on the health and yield of cocoa. This confirms findings obtained by Boateng, Codjoe and Ofori (2016), The farmers use water from their surroundings to mix the insecticides and other chemicals to spray their farms. Unfortunately, the respondents trust that those water bodies have already been polluted with dangerous chemicals from the mining sites which tends to have a harmful effect on their cocoa farms. Some farmers confirmed that, farms near to the mining sites do not yield better. Some of the cocoa trees are dying because water used to spray the farms are polluted with dangerous chemicals. According to Ghana Cocoa Board, through its subsidiary called Quality Control confirmed that some cocoa beans have been rejected as a result of chemicals residues found in the beans by foreign buying companies in May 2020 (Ghana Cocoa Board,2020).

Farmers further lamented that certain diseases like black pod disease usually affects their farms as a result of flood from the mining sites. The black pod disease results in a lower output of cocoa as a significant part of the cocoa pods rot prematurely and cause some cocoa trees die when the flooding remains in the farms for a more extended period. The total or partial removal of cocoa trees for illegal mining as in the plate 3 in the appendix A, decreased the production rate or yield of cocoa production and has devastation effects on the national gross domestic product (GDP) according to Ghana Cocoa Board.

What is the effect of small-scale mining on livelihoods of cocoa farmers in the mining communities? Responding to the effect of small-scale mining (galamsey) on livelihoods of Birim North District cocoa farmers, the respondents expressed their concerns both on positive and negative manners. About 85% representing 102 respondents said galamsey has created employment opportunity for the youth in the area and has helped reduce social vices such stealing and unnecessary loitering but unfortunately has increased cost of living through inflation as a result of migration and ordinary cocoa farmers living in mining communities have resorted to purchasing of sachet water due to water pollution from galamsey activities . The respondents further expressed their concerns that prevalence of small-scale mining has increased teenage pregnancy in the area. However, 18 of the respondents representing 15% disagreed to the above reasons citing that galamsey has caused better than harm, as seen in the Table 4.9.

**Table 4.9 Percentages on How Small-Scale Mining Has Helped Respondents**

Small scale mining on livelihoods of cocoa farmers	Number of respondents	Percentage
Small scale mining has created employment opportunity for the youth	102	85
Small scale mining has caused more harm than good	18	15

**Source: Field Survey (2020)**

To them (15%), galamsey has become better alternative source of livelihood by creating jobs in their communities. They further acknowledged that, galamsey offers more attractive daily wage than any other employment opportunity in the rural mining communities. The higher pay attracts youth from different places to the mining villages to seek employment with the miners. Apart from those who travel to the galamsey communities purposely to work with the miners, some of the cocoa farmers, especially the young tenant farmers also consider small scale mining as an alternative source of livelihood. This could be the reason why few farmers are below 35 years. They added that, small scale mining has helped to improve lives in the mining communities, because the yield and revenue stream from their farms are usually very low during the lean season making it difficult for them to sustain their families. In a search for other means to survive, they resort to a "by-day" work at the mining sites where they work and get paid daily. Holding other factors constant, the farmers can improve their wellbeing by resorting to small scale mining in periods when they



do not have other means to generate income to take care of their families. Nevertheless, most of the respondents acknowledged that this form of survival strategy is not sustainable and may have some long-term consequences on those who sell out their lands for small scale mining.

### **The Effects of Small-Scale Mining (Galamsey) On the Environment**

Almost all the respondents (97%) as seen in table 4.10, irrespective of their stands on small scale mining, said small scale mining has created pollution within the mining communities. According to the respondents, the streams and other watercourses which were sources of water for domestic use have been muddied by the small-scale mining operators and this has affected biodiversity such fish species and other macro and micro fauna as well as floral species in the water body. The mine wastes from the mining sites flow into the water bodies and make them look brownish as seen in plate 4 in the appendix A.

**Table 4.10 Percentages of Respondents on How Small-Scale Mining Has Created Pollution Within the Mining Communities**

Response on Whether Small-Scale Mining Has Created Pollution Within the Mining Communities	Percentages
Yes	97
No	3
Total	100

**Source: Field Survey (2020)**

As a result, the surrounding water bodies cannot be used for their intended purposes by the people. Moreover, some of the streams have been caused to extinction as the miners sometimes block the flow of the streams to

carry out their mining activities. In effect, the residents in the mining communities struggle to access water for domestic use. Also, trenches drilled by galamseyers during the mining process are left open, which collects liquid mine waste and refills up with water when it rains. This can be seen in Plate 5 in the appendix A. The stagnant water in the pits then breeds mosquitos and other harmful insects. Apart from increased cases of malaria, the participants also experience body itching which is suspected to result from bites from insects carrying diseases. This were confirmed during interview with the respondents on merits and demerits of small-scale mining in Table 4.11.

**Table 4.11: The Merits and Demerits of Small-Scale Mining in Birim North District**

Demerits of Small-Scale Mining	Merits of Small-Scale Mining
Galamsey operations flood farmlands, cause black pod disease and lower cocoa output	Galamsey operations improve the road network in the mining communities which makes transportation of farm proceed easily
Galamsey increases labor wages which raises the cost of cocoa farming	Galamsey provides employment especially during off cocoa season
Galamsey activities pollute watercourse and render productive lands unproductive	It provides a high-income, alternative to a dying
Abandoned mining pits breed disease-causing insects and putting their health status to risk	

**Source: Field Survey (2020)**

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

This study aimed to investigate into the effects of small-scale mining on cocoa production, environment and the livelihood of cocoa farmers in the mining communities. In view of the topic, the study was undertaken in Birim North District of Ghana where both cocoa farming and small-scale mining operations coexist. Cocoa farmers were engaged in the study to solicit their views on how small-scale mining affects their cocoa farming and their livelihood as well as their environment. This chapter briefly summarizes the research analysis with policy recommendations as well as a recommendation for further research.

#### 5.2 Summary

The results show that there are different parties to cocoa farming who have different perceptions about galamsey as compare to the perceptions that cocoa farmers are abandoning their farms for small scale mining. The tenant farmers neither have influence nor benefit from the sale of lands. They only resort to galamsey as an alternative source of living. Therefore, any effort to stop the sale of properties for galamsey should not be directed to tenant farmers. However, few of the landowners admitted given out lands to the galamsey operators which is not a surprise due to the illegality and sensitive nature of the topic. As pointed out by Bleek (1987), research participants sometimes lie to preserve their image and other people's respect when the topic becomes intimate and embarrassing or illegal.

In like manner, the responses by the landowners that they have never sold their farms for galamsey were suspected to be less frequent. Therefore, it is

possible that the landowners' answers were not wholly truthful because galamsey is a criminal act which leads to the suspicion that the researcher was a criminal investigative officer who wanted to use probing questions as a ploy to know the truth about them and arrest them later. In other words, the truth was suspected to be found in the tenant farmers' responses that cocoa farmers sell their poor yielding farms to the illegal miners. This is because the tenant farmers had no reputation at stake as they do not have lands to sell. Apart from "get-rich-quick" mentality (Ministry of Lands and Natural Resources, 2017; Hilson & Garforth, 2012), which is alleged as the inducement for galamsey, another major factor which encourages galamsey activities was identified. The perception that people sell their old or poorly yielding farms for galamsey was a significant finding in this study. The responses that galamsey brings rural development regarding roads has also not gained much attention in the literature.

The impact of galamsey on the environment, health and other socio-economic activities as enunciated in the literature was evidenced in the study as well. The contemporary debates about galamsey concerning its merits and demerits were repeated, but the negative sides dominate in Birim North District according to the responses of the study participants. Therefore, it can be argued that galamsey has not improved the wellbeing of the people in the communities where it is operated because they face several challenges and health risks as a result of the massive pollution in the wake of galamsey. It can be concluded confidently that galamsey worsens the plight of cocoa farmers because it lowers cocoa output and after mining ceases the farmers' ability to continue to generate income sustainably from the abandoned mining lands.

## 5.2 Conclusions

The literature revealed that most people across the world derive their livelihood from farming or along the agricultural value chain (World Bank, 2008). In the case of Birim North District of Ghana, majority of the people depend on cocoa farming for a living. It has been alleged that cocoa farmers in Birim North District are relinquishing their cocoa farms for galamsey. As a result, the researcher sought to examine the motivations for galamsey and how it interplays with cocoa farming and the impacts on the wellbeing of the people. The study revealed both positive and negative impacts of small-scale mining on cocoa farming and the livelihoods of people in the mining communities. As a result of the different views about small scale mining, the respondents were asked to indicate what matters to them (both advantages and disadvantages) when it comes to small scale mining. Some of the areas that people spoke about included the impact of galamsey on employment, pollution, cost of living and social vices.

Majority of the respondents showed greatest concern to pollution which was greatest worry when it comes to issues about galamsey. The residents in the mining communities face several challenges such as water pollution and health implications associated with bites from disease-causing insects bred from the abandoned mining pits and polluted watercourses. Small scale mining operations had also destroyed the quality of farmlands and cause unusual floods in the cocoa farms close to the mining sites which results in black pod diseases, death of cocoa trees, and ultimately low cocoa output. Apart from its environmental effects on cocoa farming, galamsey also leads to labor shortage with a corresponding high labor wage which consequently compels cocoa farmers to

offer a higher wage to attract and retain workers. On the other hand, the galamsey operators employ local people and migrants in the district. As a result, some of the respondents see galamsey as employment opportunity and even concluded that the small-scale mining has limited social vices in the mining communities. Some of the tenant cocoa farmers resort to galamsey as their alternative source of livelihood when cocoa is out of season.

Contrary to the allegations about farmers relinquishing cocoa farms for small scale mining, majority of the owners of cocoa farms indicated that they had never sold out their farmlands for small scale mining. However, it is possible that the landowners' answers were not wholly truthful because galamsey is a criminal act which led to the suspicion that the researcher was a criminal investigative officer who wanted to use probing questions as a ploy to know the truth about them and arrest them later. To increase response rate and reduce the possibility of lying informants, the research assistants were recruited from the communities whose familiarity provided trust and reassured the respondents that the researcher was a student and not a police officer. Nevertheless, most of the tenant farmers did not hesitate to give details about galamsey because they knew their reputations were not at stake as they do not own farmlands let alone of selling. Apart from the secondhand information that landlord farmers sell their farms for galamsey, it was also found that landowners sometimes sell portions of their lands to galamsey operators, not for mining but to construct roads to their mining sites. Remarkably, the cutting of cocoa trees to create roads to the mining sites has another advantage apart from the monetary compensation to the landowners. It was interesting to find that galamsey operations in the rural mining communities have a positive side of improving access to farms and

transportation. The paths created by the miners become accessible roads to ease movement of inputs to the farms and the transport of cocoa beans and other farm products. The findings that galamsey brings rural development regarding roads has not gained much attention in the literature.

Concerning why people would not go into galamsey, it was found that most people see farms as not belonging to themselves, but to "future children" or family and therefore must not be sold out for galamsey. The risk of galamsey was found to be low among healthy and good yielding farms as well. Nevertheless, it was also revealed that several circumstances compel other cocoa farmers to enter into galamsey. Besides the attractive pay which is commonly known as the primary reason that encourages galamsey, the results from the study further revealed that people might have other reasons to abandon cocoa farming for galamsey. For instance, some cocoa farmers with old and weak yielding farms were indicated to be more predisposed to relinquish their farms for galamsey as they could only generate incomes from the dying farms. The perception that people sell their old or poorly yielding farms for galamsey was an important finding in this study as well. Another condition which makes people choose galamsey is the perception that cocoa farming is less beneficial as the price of cocoa is too low for them to cover the operating expenses and still make superior profit relative to galamsey. Nevertheless, most of the respondents acknowledged that engaging in galamsey as a survival strategy is not sustainable and may have some long-term consequences on those who sell out their lands for galamsey.

To sum up, short term-benefits to individuals who have control of lands is the major reason that encourages galamsey operations. Unlike the benefits

which accrue to those who involve directly in it, the overall community bears the adverse effects of galamsey activities. Ultimately, galamsey worsens the plight of the affected people in the mining communities and robs them of sustainable livelihoods.

### 5.3 Policy Recommendations

This section recommends some approaches that can be adopted to control or mitigate the adverse effects of galamsey to ensure sustainable mining in Ghana. First, more of a negotiation process with stakeholders is needed instead of just military intervention. In 2017, the Government of Ghana deployed a security task force to the mining communities to use power to curb illegal mining activities. The task force has been lauded for several arrests of unlawful miners and confiscations of illicit mining equipment. However, the research in Birim North District reveals that illegal mining activities are still very much prevalent in the hinterlands. Some of the illegal miners are still in operation and have developed strategies to avoid being arrested. A negotiation process could bring a balance between the small-scale mining sector and other sustainable rural livelihood activities. This could, for instance, be achieved by making the registration process of small-scale mining comfortable and attractive. With mining license and proper regulations, the miners would be required to take their time and refill the trenches (presently, the illegal miners rush through the mining process and leave the pits uncovered due to the fear of being caught). Apart from avoiding grounds for harmful insects, negotiating with the miners to refill the mining pits would also provide an opportunity for the lands to fallow and regain nutrients for agricultural use. The security task force could help by insisting that the miners restore the lands after mining.



Secondly, instead of focusing on restricting farmers from selling their lands, Ghana Cocoa Board in cooperation with the government of Ghana could provide incentives to make cocoa farming more attractive. One of the reasons why people sell out their farmlands for galamsey is the difficulties in reviving their old and dying cocoa farms. Farmers with old and dying farms could be provided with the support and technical assistance needed to replant cocoa and maintain healthy farms. Since the benefits from cocoa take a relatively extended period to come, especially as compared to galamsey, farmers who are in the process of planting cocoa should be provided with financial aid to support alternative livelihoods until maturity of the farms. The financial support could be long-term loans whereby payments would be made when the farmers start to harvest cocoa. The initiatives would give farmers the reason to continue with farming instead of giving out their farmlands to the galamsey operators for the reason that they are not reaping good returns from the farms.

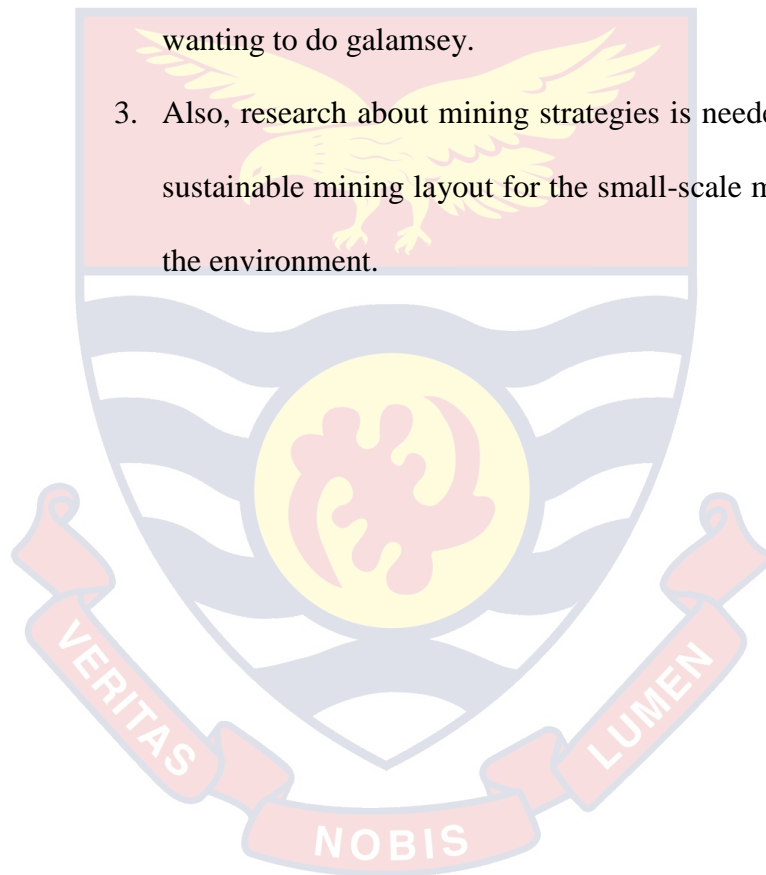
Finally, intensive public education is needed to inform cocoa farmers and other stakeholders about the proper channels to report unauthorized mining activities. It was noticed that most (68%) of the respondents did not know how or where to report unpermitted mining activities if they so wished. This would put people in a good position to report illegal mining issues without any fear of victimization.

#### **5.4 Recommendations for Further Studies**

The suggestions below would help to improve the understanding of the impact of galamsey on the living conditions of people in the mining areas and the strategies that would help to mitigate the adverse effects.

1. Further research could be conducted to examine the kind of insects produced from the mining pits and the health implication of these insects on people in the rural mining communities.
2. More work can be done to determine alternative sources of livelihoods in the rural mining communities. An available alternative livelihood for cocoa farmers especially when cocoa is out of season would help to reduce the incidence of cocoa farmers wanting to do galamsey.

3. Also, research about mining strategies is needed to determine a sustainable mining layout for the small-scale miners to preserve the environment.



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## APPENDIX A



Plate 1: A Galamsey operational site, close to a cocoa farm at Noyem.

*Credit: Boakye (2020).*



Plate 2: Pathway created by small scale miners which also aid farmers in transporting their cocoa beans. *Credit: Boakye (2020)*



Plate 3: Cocoa trees been felled down for Galamsey Activities at Sakapia in Birim

North. *Credit: Boakye (2020)*

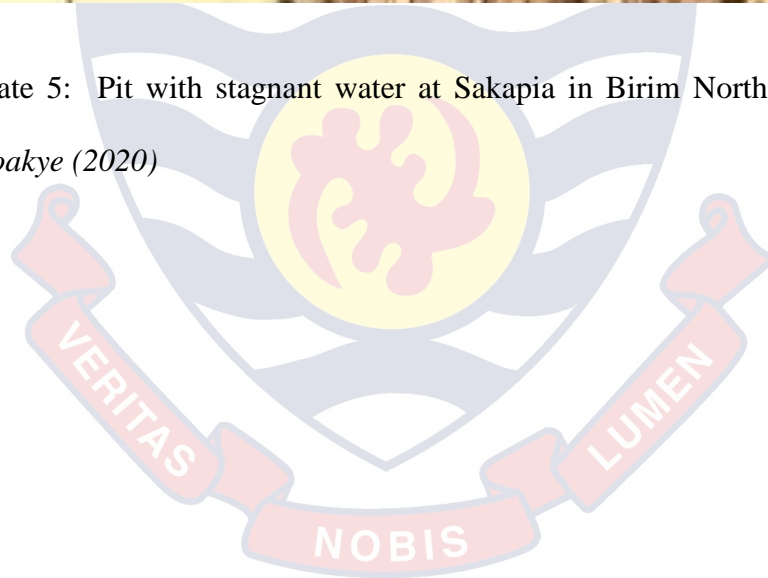


Plate 4: Shows water source been polluted by small scale mining activities.

*Credit: Boakye (2020)*



Plate 5: Pit with stagnant water at Sakapia in Birim North District, *Credit: Boakye (2020)*



**APPENDIX B**

**PRESBYTERIAN UNIVERSITY COLLEGE, GHANA**

**FACULTY OF DEVELOPMENT STUDIES**

**RESEARCH QUESTIONNAIRES**

**ASSESSMENT OF THE EFFECTS OF ILLEGAL SMALL- SCALE  
MINING ON COCOA FARMING AND LIVELIHOOD BIRIM NORTH  
DISTRICT**

1. Gender: a. Female [ ] b. male [ ]
2. Which category below includes your age?
  - a. below 18 [ ] b. 18-25 years [ ] c. 26-35 years [ ] d. 36- 50year [ ] e. above 50 years [ ]
3. What is your level of formal education?
  - a. No formal education [ ] b. Primary [ ] c. JHS [ ] d. SHS [ ] e. Tertiary [ ]
4. What is your ownership status of the cocoa farm? a. Farm owner [ ] b. Tenant farmer [ ] c. Family land [ ] d. Sharing [ ]
5. Is cocoa farming your main source of income? a. Yes [ ] b. No [ ]
6. If no, what is your main source of income? a. Teaching [ ] b. Nursing [ ] c. Trading [ ] d. None [ ]
7. Are you the breadwinner of your family? a. Yes [ ] b. No [ ]



8. If yes, how many people do you cater for? a. 1-5 [ ] b. 6-10 [ ] c. 11-15 [ ]

9. Do you know anything about illegal Small-scale mining (galamsey)? a. Yes [ ] b. No [ ]

10. Do you think illegal Small-scale mining (galamsey) activities have increased in this community in the past 5 years? a. Yes [ ] b. No [ ]

11. Do you think people in authority influence illegal Small-scale mining (galamsey)? a. Yes [ ] b. No [ ]

12. Have you ever lost a portion of your farmland due to illegal Small-scale mining (galamsey)? a. Yes [ ] b. No [ ]

13. If yes, how did the illegal Small-scale mining (galamsey) operators get access to your farmland? a. Agreement with me [ ] b. Agreement with authority in the community without my consent [ ] c. The galamsey operators started without my consent or permission from anyone in this community [ ] d. None [ ]

14. Has illegal Small-scale mining (galamsey) posed a problem to the availability of land for your cocoa farming? a. Yes [ ] b. No [ ]

15. If yes in what way has illegal Small-scale mining (galamsey) posed a problem to your availability of land for your cocoa farming? a. creation of dead trip holes [ ] b. destruction of water bodies on the land [ ] c. release of harmful chemicals to the land [ ] d. others .....

16. Were you compensated? a. Yes [ ] b. No [ ]

17. How was the compensation? a. There was no compensation [ ] b. I was compensated but less than my expectation [ ] c. I was fairly compensated [ ] d. The compensation far exceeded my expectation [ ]

18. Has illegal Small-scale mining (galamsey) posed any problem to the availability of labor for cocoa farming? a. Yes [ ] b. No [ ]

19. If yes, how? a. No available labour force to work on the farm [ ] b. High cost of labour charge due to the limited number of labour force available [ ] c. Labourers do not have enough time to work on the farm once employed [ ] D. None [ ]

20. Does illegal Small-scale mining (galamsey) provides you with capital to support your cocoa farming? a. Yes [ ] b. No [ ]

21. Do you think some cocoa farmers will prefer to sell portions of their lands for illegal Small-scale mining (galamsey)? a. Yes [ ] b. No [ ]

22. If yes why? a. Illegal Small-scale miners pay higher [ ] b. Poor cocoa yield [ ] c. other specify.....

23. Do you think some farmers prefer not to sell portions of their farmlands for illegal Small-scale mining (galamsey)? a. Yes [ ] b. No [ ]

24. If yes, what is the main reason why people would not want to sell portions of their lands for illegal Small-scale mining (galamsey)? a. Illegal Small-scale mining creates dead holes within the farm land [ ] b. Illegal Small-scale mining (galamsey) destroy water bodies available [ ] c. Illegal Small-scale mining (galamsey) releases harmful chemicals to the soil which affects land productivity [ ] d. None [ ]