

PRESBYTERIAN UNIVERSITY COLLEGE OF GHANA

FACULTY OF DEVELOPMENT STUDIES

DEPARTMENT OF RURAL AND COMMUNITY DEVELOPMENT



**IMPACT OF ILLEGAL SMALL-SCALE MINING ON
THE LIVELIHOOD OF THE RESIDENTS OF EAST
AKYEM MUNICIPALITY**

**BY
MOSES KWAME ADOMAKO ASIAMA**

SEPTEMBER 2019

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Dissertation submitted to the Department of Rural and Community
Development of the Faculty of Development Studies, Presbyterian University
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of Arts degree in International Development Studies

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SEPTEMBER 2019

DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere.

Candidate's Signature.....Date.....

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Supervisor's Declaration

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

Supervisor's Signature.....Date.....

Name: Dr Richard Amfo-Otu

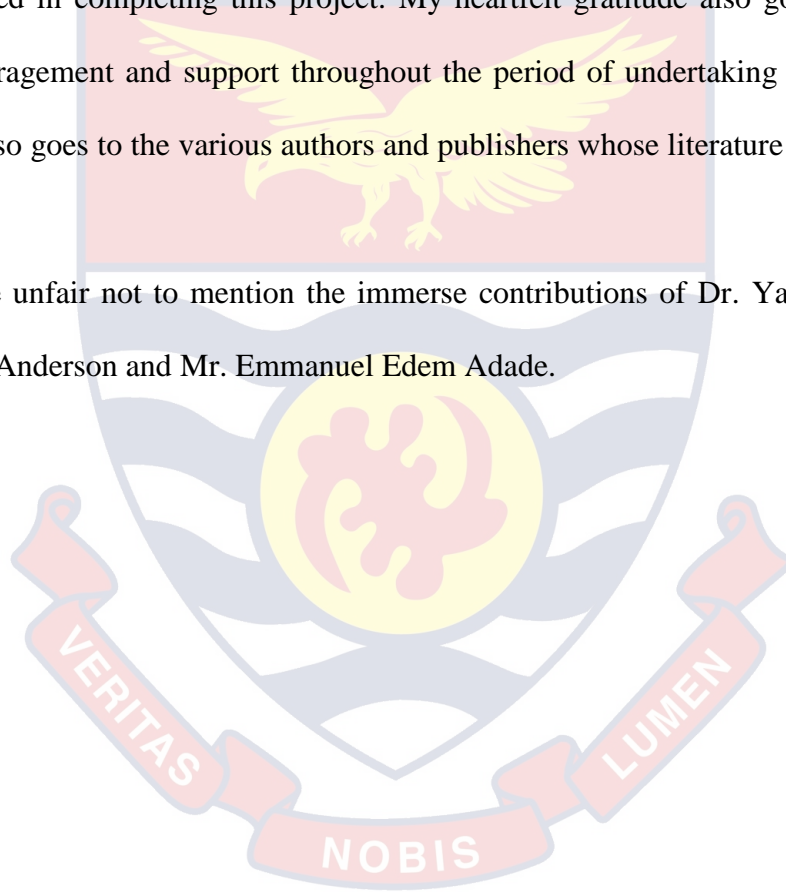
ABSTRACT

The main objective of this study is to investigate the impact of illegal small-scale mining on the livelihood of the residents of East Akyem Municipality. The study area for the study is East Akyem Municipality which is located in the central part of the Eastern Region of Ghana. The study made use of the mix method approach which had to do with both qualitative and quantitative research design. The study further used questionnaire for primary data collection, and the data obtained were analyzed using the Statistical Package for Social Sciences (SPSS). Findings of the study were that; even though illegal small-scale mining is a lucrative and crucial source of employment for the people of East Akyem Municipality due to the non-availability of employment opportunities, and also help facilitates economic activities, it has a significant negative impact on the livelihood of the residents of East Akyem Municipality. Per the negative impact of illegal small-scale mining on the residents of East Akyem Municipality, the researcher of this study gives amongst many the following recommendations; that parents be educated on the value of formal education to encourage their wards to stay in school, rather than engaging themselves in the activities of illegal mining; creating alternative livelihood opportunities such as farming, just so indigenes are not driven to engage in illegal mining activities.

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It would be unfair not to mention the immense contributions of Dr. Yaw Boafo, Mr. Roger Sigismund Anderson and Mr. Emmanuel Edem Adade.



DEDICATION

First and foremost, I want to dedicate this work to Almighty God for his guidance and protection throughout this study, and to my family and friends who supported me through prayers and moral support for this entire program.



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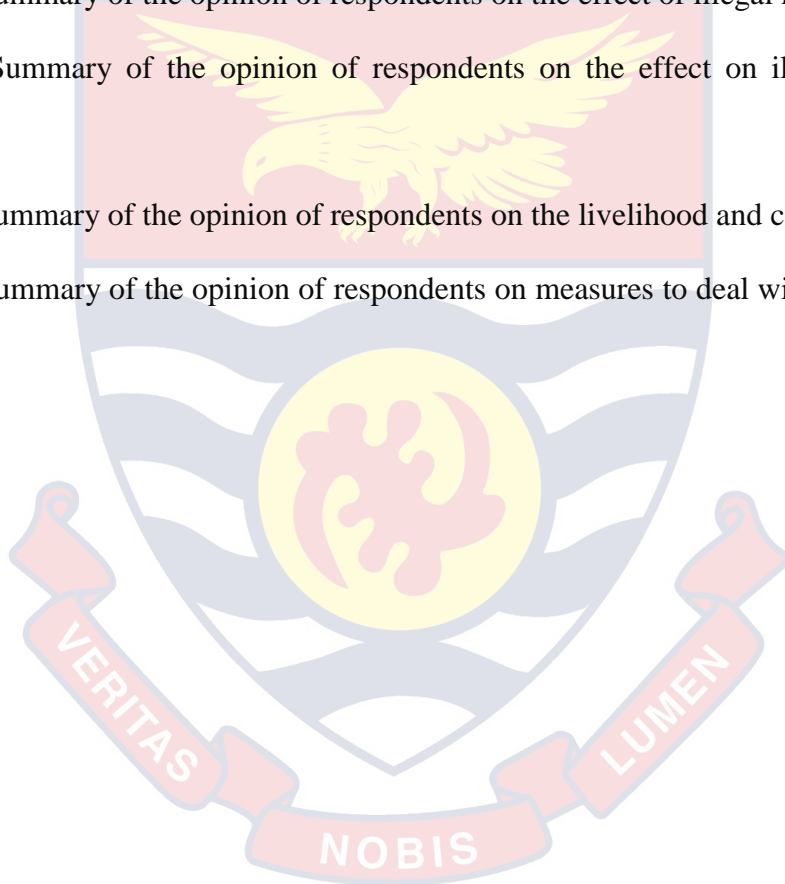
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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Small-scale mining is not a new phenomenon and has been with us for centuries across the world (Hilson, 2001). This according to Kessey and Arko (2013), small-scale mining has been part of economic activities throughout the eighth century. According to Adjei, Oladejo and Adetunde (2012), Ghana has a long tradition of small-scale gold mining thereby, justifying why people are engaged in small-scale mining in the coastal areas which predates to the “Gold Coast”, now called Ghana. Lesser expenditure or capital is needed to undertake small-scale mining. In that regard, a group of persons not more than twenty in number, or a co-operative group numbering ten or more can carry out small-scale mining. Small-scale mining is also referred to as “galamsey” in the local parlance (Hilson, 2002).

In Ghana, an estimated number of 150,000 people are actively found in the small-scale mining extraction sector. Most of these people are illegally extracting ore on concessions belonging to large mining firms or in restricted areas (Ghana Academy of Arts and Sciences, 2003). 10% of Ghana’s gold production is obtained through illegal small-scale miners (Ntibery, 2004). Thousands of Ghanaians without a job have moved to this sector for greener pastures. According to the World Bank (2003), small-scale mining is most prevalent in the remote areas of a country, and is driven by the economic strength of a country.

These illegal gold miners operate in the extractive sector without license or approval from the regulatory authorities such as Water Resources Commission, Ghana Mineral Commission Environmental Protection Agency, Municipal Assemblies and Forestry Commission. The activities of illegal mining are done in prohibited and sensitive areas such as water bodies, forest reserves, residential areas, and culturally significant areas. Added to their illegal

activities is the evasion of tax with less respect for human rights (Mantey, Owusu-Nimo and Aubynn, 2016). Artisanal mining predates from colonial days to date, with the usage of low-tech implements in the extraction of the ore such as “pickaxe and shovel”.

The modern-day illegal mining “galamsey” extraction is done in a more advance mechanical way, where excavators, bulldozers and other heavy equipment, chemicals intensive, that is mercury, hydrocarbons, and other network of chemicals that pollute the environment and cause disruption. The illegal small-scale mining has invaded or infiltrated districts with devise operations to extract gold, due to inadequate alternative livelihoods in the mining areas in Ghana (Teschner, 2011). Mining is seen as a major subsistence for the poor rural communities in many parts of the world. (Eshun, 2005). The sector provides livelihoods for millions of people, and also seen as a major cause for resources reduction and environmental issues in mineral rich areas or locations (Agyeman, 2010). Small-scale mining is a game changer, particularly illegal small-scale mining, and regarded as relevant just as the large-scale mining across any part of the world. This is due to the large numbers it employs in the sector and the critical role in alleviation poverty and development in the rural community (Opoku-Antwi, Amofah & Nyamaah, 2012).

International Labor Organization (ILO) and World Bank noted that the activities of small-scale miners have negatively affected close to 100 million people in communities. It is pervasive in the underdeveloped countries where the livelihoods of the people depend largely on mineral resources (Clausen, 2001). The proportion of women out of the number of people negatively affected by the activities of illegal miners is huge (Henschel, 2002).

1.2 Problem Statement

The people in the rural communities largely depend on farming for their livelihoods in Ghana, and illegal small-scale mining “galamsey” is regarded as means to an end at locations where minerals are discovered (Yeboah, 2014). Safety of the people engaged in small-scale mining is precarious as there is a significant negative impact on the environment (Armah, Luginaah, Taabazuing & Odoi, 2013). The fertile farmlands and virgins forest situated in the middle belt of Ghana for instance are almost gone due to the extraction of gold and other minerals. The sector poses serious challenges, especially the small-scale surface mining in Ghana, in terms of environmental issues and its impacts on the ecosystems such as land degradation and mercury pollution (Hilson, 2001). Water bodies are heavily threatened by the small-scale surface mining. Illegal miners often operate close to the water bodies as their source of water for their activities. The wastewater generated contains harmful chemicals, which is discharged into nearby water bodies (Adjei, Oladejo, and Adetunde, 2012). Illegal mining operation has heavily polluted major rivers such as Pra and Offin. Tax evasion is common amongst the illegal mining operators that is borne out of greed and to some extent, ignorance. The activities of illegal miners’ lack measures to deal with the negative results on the environment.

With regards to the impact of illegal small-scale mining on livelihood, several studies have been done globally, such as that undertaken by (Thomas Hentschel, 2003) in London, but few has been done in Africa, especially in rural areas in Ghana. It is in this regards the researcher of this study sought to contribute significantly to the already existing literature by clearly zooming in the impact of illegal small-scale mining on the livelihood of the residents of East Akyem Municipality.

1.3 Purpose of the study

The main objective of this research is to examine the negative effects of illegal small-scale mining activities on the livelihoods of the people of East Akyem Municipality.

Specifically, the study seeks to:

1. Examine the effects of illegal small-scale mining activities in the livelihood of the people of East Akyem Municipality.
2. Assess the impacts of illegal small-scale mining on the farming activities in East Akyem Municipality.
3. Identify the measures adopted to deal with high rates of illegal small-scale mining activities in the East Akyem Municipality.

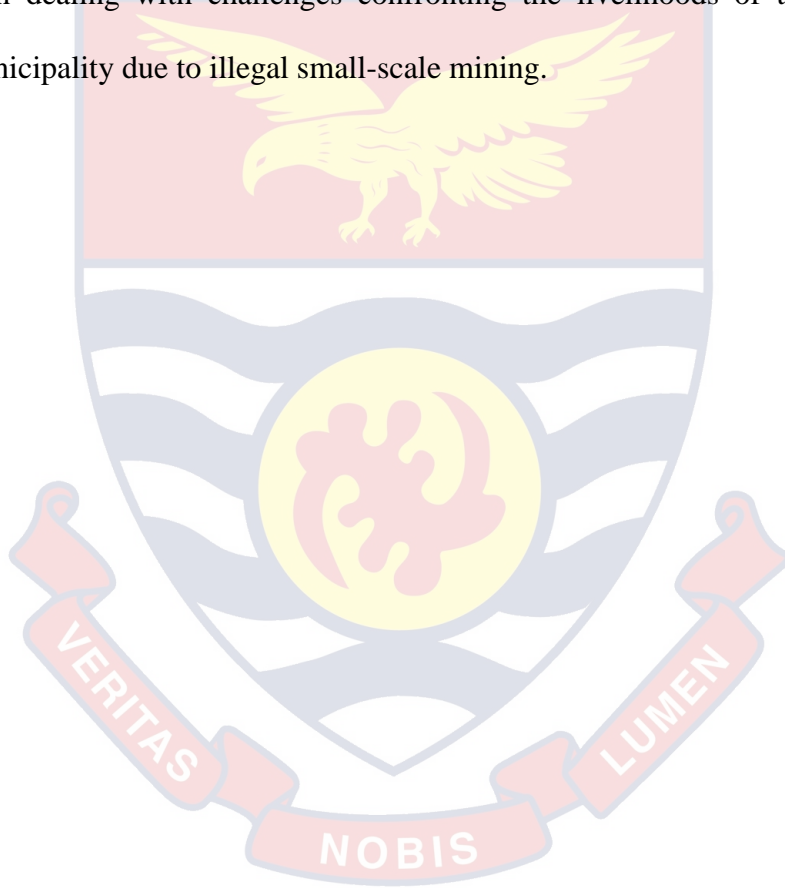
1.4 Research Questions

1. What are the effects of illegal small-scale mining activities in the livelihood of the people of East Akyem Municipality?
2. What are the impacts of illegal scale mining on the farming activities in East Akyem Municipality?
3. What are the measures adopted to deal with high rates of illegal small-scale mining activities in the East Akyem Municipality?

1.5 Significance of the study

Illegal small-scale “galamsey” has become a major environmental threat. This study will help to deal vigorously with the issues associated with it, in terms of contributing to policies and measures to reduce the negative effects of illegal small-scale mining on the environment. This will serve as the basis for further study on the topic “the impact of illegal small-scale mining

on the livelihoods on the residence of East Akyem Municipality”, and serves as guide for policy formulation for the government and non-governmental organizations (NGOs) to curb the effects of illegal small-scale mining in the communities. The study will examine mechanisms by which the illegal small-scale mining activities affect the livelihoods of these residences, and provides the possible causes and effects of illegal small-scale mining in areas heavily dominated by illegal small-scale mining “galamsey” operations. This study will also be useful in dealing with challenges confronting the livelihoods of the residents of East Akyem Municipality due to illegal small-scale mining.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

Reviewing the literature enables the researcher to plan the study methodology and serves as basis for the topic to be research into (Burns & Grove, 2009). The sources of literature include books, published journal and textbooks.

2.2 Concept of illegal mining

Artisanal and small-scale mining also known as “galamsey”, has been part of the country’s mining history Reisenberger (2010). Before the arrival of the Europeans, the local people were heavily involved in the mining of gold ore (Bawa, 2010). The traditional mining methods or techniques applied by the artisanal and small-scale miners in identification of the ore’s location and extraction from bearing rocks and earth. The sector requires nominal or no technology. The small-scale mining is about individuals, families and small groups (Hentschel, Hruschka & Priester, 2002) cited in Ingram, *et al.*, 2011). Department of Minerals (2014) asserts that illegal mining refers to exploring or extracting without the necessary approval or document. Without land rights, exploration and mineral transport permit (Dozolme, 2016). The extractive operations are not sourced to legitimize the operations, and therefore makes them illicit activities. The unregulated artisanal mining and the people engaged in these activities are known as “zama-zama” is defined as illegal mining in South Africa (South Africa Human Rights Commission, 2013). The disregard to the mining laws, undertake mining in prohibited areas and failure to follow the environmental rules and regulations, labor and tax laws defines illegal mining Global Initiative Against Transnational Organized Crime (2016). Illegal mining operation is due to non-mining shaft closure and

abandoned mines, which provides access for these operations (Benchmarks Foundation, 2016). The large numbers engaging in the illicit industry are facing economic crisis confronting them as a people (Chamber of Mines, 2016). The causative contributions for illegal mining activities is solely base on economic issues (Boning, 2015). The illegal mining sector just as the small-scale uses lesser technology for the extraction and labour intensive. The use of hammer, shovel, pickaxe, pans and chisel are some simple equipment for the illegal mining operations (Reisenberger, 2010). The laws of Ghana categorically state that the illegal mining “galamsey” activities is not just on documented concessions, but the illegal miners undertake activities in areas with mineral deposits and prospect for gold. According to Tieguhong *et al.* (2009), the artisanal and small-scale sector assists the economy in ways such as increase level of income earnings in economies; Source of livelihoods for poor and marginalize group of people; lesser startup time, resource and technology; employs semiskilled and unskilled labour force and also labour intensive; production, productivity, lesser technology; Low levels of mechanization, production, productivity, retrieval and adeptness; engaged in low-income activities in terms of subsistence agricultural and concurrently with the workers.

2.3 Causes of illegal mining

In the 1970s, economic decline gave rise to the illegal mining “galamsey” and people seeking for additional income alternatives (Owusu and Dwomoh, 2012). During this period, the phrase “gather them and sell” was coined, by the illegal miners and later came to be known as “galamsey”. These illegal miners operate in groups in search for gold and sell the ore as well. The illegal mining operations largely thrive in the rural setting of the country, such as Tarkwa, Prestea, Obuasi and Bogoso. Unemployment, as well as the attractive income from sales,

pushed people to engage in illegal mining or “galamsey” in the country. The age group of about 15-24 constitute mostly to the unemployed category with a percentage of 25.6% and twice of age group of 25-44 and also thrice the age group of 45-64 (African Economic Outlook, 2012). The ILO (1999) estimates that 13 million people are deeply involved in this illegal mining sector around the globe (Hilson et al., 2010), and an extra hundred million (100) million people are heavily relying on illegal mining for their livelihood survival. (Danielsen, Balete, Poulsen & Nozawa, 2000; CASM, 2009 cited in Ingram et al., 2011).

Farming is foremost source of occupation in the rural setting of Ghana. Income generating activities such as fishing and rearing, and others have drawn much attention. One of the major livelihood alternative source for people is illegal mining, and in most of the countries across Africa, small-scale illegal mining “galamsey” is a key employment avenue for people. This sector employs about one hundred seventy thousand (170,000) people in Ghana (Adjei, Oladejo & Adetunde, 2012). In these countries the mining employed one thousand (1000) people and in Zimbabwe an estimated population of fifty thousand (50,000-350,000) to three hundred and fifty are in the sector as at 1999 (Nyambe & Amunkete, 2009). One of the factors that drives people to engage in illegal mining “galamsey” is poverty; it is in ascendency across the African continent and which Ghana cannot be excluded. United Nation’s Millennium Development Goals charged other countries together with Ghana to reduce the high poverty levels. A research paper “Small-scale mining and its impact in Namibia: Nyambe & Amunkete, 2009) concluded that “galamsey” illegal mining contributes to poverty alleviation, based on the employments opportunities in there and also sustaining indigenous businesses and income earnings in terms of trade. People are engaged in illegal mining “galamsey just to escape the poverty, the illegal mining is lucrative source of employment for

people engaged in the sector. Rainfall patterns is a contributing factor in the illegal mining “galamsey” menace in the country.

The rural farmers in these mining areas cultivate crops in the raining season, and in the dry season they tend to shift their attention into illegal mining and engage in these activities to earn additional income and farming is halted in the name of illegal mining. Engaging in illegal mining “galamsey” is alternative for the farmers who believed that crops such as cocoa and rubber mature rate is not fast, and so they participate in these activities for money to support their families and deal with their idleness (Kuma & Yendaw, 2010). According to Government of Ghana (2003), the illegal mining “galamsey” sector has received support and protection various quarters; this also depends on how much one is ready to part away and the site for the mining or location. There is evidence proving that public officials, chiefs and well-resourced industrialist are thwarting the work of these state institutions who are to ensure standards and regulations in the illegal mining sector poor (Nyame & Grant, 2014). Chiefs are entrusted with this stool lands and most often cede cultivated farmlands to illegal miners for large sums (Myjoyfmonline.com, 2012b). The enactment of small-scale mining law (P.N.D.C. L 218) was towards making it accessible for the locals to have stakes in the sector for the decades of huge foreign influence in the mining sector, the enactment gave 300 mining concession (Amankwah & Anim-Sackey, 2000).

The implementation of the new mining law P.N.D.C.L. 218 came in with many bureaucratic constraints in acquiring small-scale concessions and licenses, which explains high illicit mining partly (Hilson & Potter, 2013). Illegal mining menace is based on non-availability of alternative employment opportunities, which encourages people to engaged in it (Teschner, 2011, Bush, 2008). Leased out fertile farmlands is been used for illegal mining and not reclaimed after mining (Nyame & Blocher, 2009). Economic situation encourages people to

engage in illegal mining even though not these people are uneducated or poor (Nyame & Grant, 2014) but rather poverty is the underpinning factors in the illegal mining (Hilson & Garforth, 2012; Hilson & Potter, 2005; Banchirigah, 2008). People are forced to engage in the illegal mining due to financial constraints. The artisanal mining sector is seen as sustainable livelihood alternative for these people in the mining communities (Hilson & Garforth, 2012). The sector is considered to be local initiative and governed by the traditional law are the some of the constraints, as compare to the government partnership backed with statutory laws in the large-scale mining and rightful registered artisanal mining is lucrative to individuals without access to capital (Nyame & Blocher, 2009; Hilson & Garforth, 2012). Another major factor of this illegal mining is the structural adjustment program due to retrenchment aspect it came with (Hilson & Potter, 2005; Nyame & Blocher, 2009). The unemployment is categorize into two groups (Hilson & Garforth, 2012) that's urban unemployed who have migrated to rural area and engaged in illegal mining, and also those rural population who have discontinued farming on basis of non-availability of fertile lands due to loss to large-scale mining and artisanal miners (Hilson & Garforth 2012; Nyame & Blocher, 2009). The rural and urban unemployed sees the illegal mining as an alternative livelihood due to non-existence of formal employment opportunities. Accessing mining concession is cumbersome and bureaucratic to obtain, the legal mining rights for artisanal is full of delays and increases cost, which encourages illegal mining. Government leases lands to large-scale mining companies through formal contracts but the informality and flexibility are most preferred by artisanal miners due to the local community arrangement for the parties (Nyame & Blocher, 2009). The illegal mining is thriving on basis of difficulties to obtain licenses for mining by the artisanal miners (Nyame & Grant, 2014; Hilson & Potter, 2005. Banchirigah (2008) also asserts that in the 1990s in Tarkwa 14 farming communities of population of 30,000 were displaced because of

acquisition of concession by large-scale mining firms. This compounded the prevalent unemployment issues confronting us on basis of large-scale firms not providing alternative employment for huge numbers of displaced people (Banchirigah, 2008). Concession has played in marginalizing the local people by large-scale mining firms, which pushes people off their ecological marginal lands without any source of livelihood alternative. People still engage in farming after displacement, which means there is available land for use (Amposah, 2011).

Arable lands have declined, and the marginal lands is increasing hence losing its viability for farming on basis of cultivation and decline in yields and also making subsistence farming difficult (Amponsah-Tawaih & Darteh-Baah, 2011). Artisanal miner's not meeting mining statutory requirement hence sees illegal mining as alternative livelihood. Economic conditions of the mining communities through the loss of farmlands and land resource drive them to poverty, see illegal mining as a livelihood, and engaged in these activities. Large-scale mining legally acquire land, which is expensive venture and less labour intensive (Amponsah-Tawaih & Darteh-Baah 2011) compare to farming and artisanal mining. Communities with rich minerals and earn extra income have been deprived through the large-scale mining. These lands are not used for large-scale mining alone but farming and artisanal mining as well (Bush, 2008).

2.4 Illegal mining effects

Mining has adverse implications on these ore rich communities. Governmental agencies like the Environmental Protection Agency (EPA), Minerals Commission, Forestry Commission, Lands Commission and Water Commission are organizations try to ensure that the adverse effects of mining are controlled and minimized. To make this happen effectively, it is

necessary to know who is mining what and where. It therefore requires that all miners are legally registered, and their activities monitored. For most illegal mining (galamsey) miners, their interest is to extract minerals. Their activities have serious adverse implications on communities in which they mine. According to Opoku-Ware (2010) illegal “galamsey” miners use crude methods to mine gold and other relevant or profitable minerals. This includes mining in water bodies and using mercury directly in this water bodies. Digging several feet underground, most of the pits are not well supported and occasionally serve as death traps. They mine indiscriminately without accurately knowing whether the area bears gold or not. Some basic adverse environmental impacts of illegal mining “galamsey” are Environmental erosion, Formation of sinkholes, Loss of biodiversity and Contamination of soil, groundwater and surface water.

2.5 Small-Scale Mining Sector Regulations

The indigenous mining sector or small-scale mining from the precolonial era to 1980s largely remain unregulated and receives little support from the mediated institutions of state. In 1989 following the decades of unregulated operations, the sector was regularized with the legislation of the (PNDCL 218). The law permits Ghanaians to apply license for mining operations for a plot of land not above 25 acres, for about three to five years and non-use of explosives (Hilson 2001; Yakovlena 2007). Recognizing the small-scale mining sector has thrown the fears of the illegal miners been prosecute and getting the right prices for the gold (Simpson, 1999). The government also benefit from revenue, production and prevent product from being smuggled. Two groups have come out of this initiative and these are legalized (registered) and non-legalize “galamsey” their operation is without license and undertake activities on concessions held by firms (Amankwa & Anim-Sackey 2003). The shortage in the

licensing fueled the expansion of illegal operations and unemployment accompanying poverty nationwide, particularly in rural areas. (Hilson & Potter, 2003). Eighty five percent (85%) of the country's artisanal and small-scale gold-mining operators are into galamsey. The government has legalized the artisanal small-scale mining sector, prospective applicants require to follow a streamlined regulation to obtain a concession, bureaucratic inefficiency and ineffective policies are obstacles for the formalization, making the illegal activity lucrative (Banchiriga, 2008). Goba (2015) asserts in 2005 over 250,000 small-scale miners (60% of the total labor force) were without a license and engaging in illegal mining activities. There no such difference between the legal or illegal small-scale mining and also the organizational setup and technology, but the legal small-scale miners have security of land tenure.

The sector has generated huge revenues since 1989. The artisanal and small-scale miners have produced over \$300 million worth of gold between 1989 and 1994. 30, 000 small-scale miners reportedly mined \$68.36 million worth of gold and sold to government officers (United Nations 1996). Four hundred (400) properties registered under legalization concept produced over 45,000 ounces of gold between 1989 and 1993 (Davidson 1993; Hilson and Potter 2003). The massive growth in ore production experienced in the artisanal and small-scale gold-mining sector in Ghana can be attribute to unemployment and accompanying poverty nationwide. The World Bank reports shows that 90% the population are in the poverty line (Hilson and Potter 2003). The artisanal mining is a livelihood for millions of miners, families and mainstay of local rural economies in most part of the world (Davidson, 1993). Akyem Abuakwa region is not an exception where the sector has become a safe haven for poverty-stricken people and seasonal farmers in the area. Ghanaians have migrated to Akyem Abuakwa to escape poverty and are turning into artisanal and small-scale gold miners.

People from Wa and Bolgatanga, and others from Accra, Kumasi, Prestea, and Tarkwa. Individuals from the Western region especially have substantial experience working underground with the large-scale mines in the Western Region (Banchiriga 2006). The illegal mining (galamsey) has propelled significant migration to these areas; some miners even come with their families. Many of the illegal miners (galamsey) are locals or indigenes. About 40% of illegal artisanal small-scale mining at Noyem and Ntronang “galamsey” areas are women (Ykovlena 2007).

The closure of Ghana Consolidated Diamonds has significantly increased the rate of unemployment in Ghana (Hilson, 2010). Few alternative or prospect available most for former employees of Ghana Consolidated Diamonds, and have shifted their attention to alluvial diamond fields, but other lifelong diamond miners have employment in the neighboring artisanal gold-mining sector. The people are engaged in artisanal gold mining mainly because of poverty but continue in activities which they have enough skills and experience and as source of stable employment and consistent income flow. It immediate debt relief for the miners. Most find employment at the unlicensed artisanal gold-mining areas in the neighboring localities—such as Kobriso, Kyebi, and Akenten provide income for miners. The environmental and socioeconomic implications of small-scale mining in Akyem Abuakwa. The impact of small-scale gold mining in developing countries and its environmental issues has been well-documented (Holloway 1993; Lacerda and Solomons 1998; Meech, Verga, and Tromans 1998; Mireku-Gyimah and Suglo 1993). Rudimentary technologies and management practices have caused significant harm around the globe, water and land contamination are primary manifestation of the activities of illegal small-scale mining. This has happened at Akyem Abuakwa. Illegal small-scale and diamond mining has led to serious vulnerability and devastation in the traditional state.

According to the 1992, Constitution, Minerals and Mining Act 703 (2006) govern granting of mineral rights. The mining right is granted to a mining firm after the president has assented to it and this has to go through the Parliament of Ghana for ratification. Once the ratification goes through, the mining firm reserves the right to resettle communities living on the concession.

Social license is required by mining firms to operate smoothly. Social license is getting the collaboration and understanding of the communities involved in order to avert resistance to operations. Firms may have legal rights to mine, but the resistance of a community can prove very expensive and derail plans of extraction. This has resulted in many confusion or conflicts in parts of resource-endowed countries in Africa. (Sachs and Warner 1995; Auty 2001; Karl 2004; Humphreys et al. 2007). Communities affected by the mining operations are compensated for loss of properties and livelihoods.

2.6 Impact of Illegal Small-Scale mining on Sustainable Development

According to Ayre and Callway (2005) environment, society and economy are pillars that relies on sustainability. The artisanal small-sale sector is a threat to each of these pillars and this should be considered for sustainability. Mercury emission reduction will help the environment to become sustainable and reduced the earth surface damage because of physical mining activities and deforestation (Versol, 2007). Better social environment can be achieved through sustainability for society by increasing rights, organizer miners, technology change and health protection (Versol, 2007). Sustainable economy heavily depends on sustainable environment. There is diverse explanation for small-scale mining within an economy. There are arguments that the sector is dirty, dangerous and disruptive and not to be encourage (ILO, 1999).

Regulating the sector is based on the broad consensus of views, it looked at the artisanal small-scale mining in terms of environment and development challenge which creates bad name for the

sector. Poor health, safety deficit and environmental issues engulfs this sector largely (Hentschel *et al.*, 2002). People have diverse views for this area of the mining sector, hence there is strong evidence that artisanal and small-scale mining can contribute to national income and poverty alleviation (Hentschel *et al.*, 2002). The economy of Ghana can enjoy the huge benefits of the small-scale mining through a sustainable manner. It is based on this that the numerous governments see as it as priority in terms of regulation. Small-scale mining comes with serious environmental problems and concerns. Destruction of forest, pollution of water resources are some of environmental problems associated with artisanal small-scale mining. The mining sector comes with social issues and can exist without these problems. Although, the sector drives economic growth and development idea large or small-scale mining but generates huge negative spillovers.

Communities in these mining fringes suffer the impact of the mining activities and their irresponsibility's. This explains how the sector deprives livelihoods of people in terms of land loss, water pollution and other environmental issues in gold mining in Ghana.

2.7 Mining Methods

According to the small-scale miners the methods for extraction lies in the deposit location. In view of financial difficulties of these small-scale miners. The large numbers rely totally on traditional or manual methods of mining for the illegal mining exploitation, featuring simple tools such as pickaxe, shovel, pans, chisels and hammers. The methods for mining in the

small-scale sector can group into three categories that is hard rock alluvial mining, shallow alluvial mining and deep alluvial mining.

Hard rock alluvial mining

Gold bearing reef extraction is through the hard-rock technique method located to deep-seated or surface (Ntibrey, 2001). When the sunk holes intercept the reef, it is worked on lengthwise the strike. Weathered reef is extracted by use of chisel and hammer by the small-scale miners to mine the ore. The laws prohibit the use of explosives for mining hard ore.

Shallow alluvial mining

Dig and Wash as popularly called is mine through shallow alluvial mining technique. The deposit is normally set up in low-lying areas and valleys. Three meters depth of deposits should not exceed. Cleared vegetation and excavated to reach the gold rich layer. The extraction and transportation of the ore is then done close to a stream for sluicing in order to extract the gold. Significant proportion of industry operators have adopted this method of mining based on the ease of reaching deposits and treating the ore. Illegal mining is predominately shallow alluvial mining (Ntibrey, 2001).

Deep alluvial mining

The deposit is normally found along the riverbanks and mined through the deep alluvial mining techniques to prevent collapse of the pits. Pit and digging techniques is applied in excavating until the gold bearing gravel is reached. Depths of 7 to 12 meters are these ore found. Terrace or benches are erected along the pits sides to prevent collapse.

2.8 Mining and Environmental Effects

The illegal small-scale mining can have serious impact on the ecosystems and society. Hence can cause huge environmental problems in terms of poisoning the environment and wildlife

by these heavy metals and the extractive chemicals use as well (Fashola et al., 2016). According to Dissanayake and Rupasinghe (2017), this illegal mining cause erosion and siltification of rivers. The mining is geographical materials and extraction minerals with an economic value. It comes with several environmental effects including loss of biodiversity, erosion, contamination soil surface water, and land and air pollution. According to Ostergren and Le Boss (2011) surrounding population's health by contamination through the activities of mining on basis of chemical leakage. Therefore, interaction of human with its environment has many implications and unpleasant facts (Ostergren & Le Bosse, 2011). There numerous possibilities the environment offers, and, on that basis, relevant choices are based on cultural and technological advancement (Ostergren & Le Bosse, 2011). Environmental degradation and change are driven by these few necessary choices, and exploitation of natural resource are not recent phenomenon. The environment and society have some catastrophic effects of transition from the exploration to exploitation. Martinez-Alier (2002) asserts that the poor environmental decision will have dire consequences for the future generation irrespective of the economic gains. In furtherance, the illegal small-scale mining threatens the environment seriously. There are well-documented facts on illegal small-scale mining threats pose to the environment in Ghana. Illegal small-scale mining is conducted without the necessary safety precaution and it is dangerous (Harding, 2013). These toxins, and the miners, people and the agricultural operations poison the environment, though revenues from mining is a relevant source for the underdeveloped countries (Hilson, 2002).

2.8.1 Land Degradation

Tetteh (2010) asserts land degradation and destruction is heavily threaten by small-scale surface mining activities, destroying about 13% of the total forested land in Ghana. According to Schueler *et al.* (2011), due to surface mining large farmlands have been loss through

mining concessions in the Western Region with deforestation taking 58% and 45% loss within the concession zones. Land destruction in the form of excavations are common (Aryee, 2003; Yelapaala, 2004) and in some places riverbanks are mined to a depth of 35m expanding about 60m wide (Hilson 2002). Biodiversity conservation is been threaten with devastating effects on soil ecosystems leading to increased soil temperature, loss and depletion of soil nutrients, erosion, changes in topography (Tetteh, 2010). The ecosystem with unique habitat such as fauna and flora are been destroyed and the lands becoming less productive due to illegal mining (Asiedu, 2013),. Agricultural lands, human settlements and concessions often found around forest zones, these results in human competition for lands and farmers deprived of those lands (Tetteh, 2010). The effects of the small-scale mining can be felt, when the unstable piles of waste, barren lands, abandoned excavations and unclaimed pits, sometimes full of water, death trap and mosquito breeding grounds (Aryee, 2003; Yelapaala, 2004). Due to the unhealthy, unsafe and unproductive of these large farmlands are abandoned.

2.8.2 Mercury pollution

According to Donkor *et al.* (2006), the extraction industry in Ghana and the globe as well are facing serious environmental problems of mercury, which is one of the toxic elements. Volcano eruption, weathering and variety of anthropogenic sources and also burning of fossil fuel or mining are natural element, which can cause the mercury contamination (Oduro *et al.*, 2012). The continuous use of mercury in the small-scale mining poses a serious health risk of water quality in other parts of the world and Ghana as well (Osisidan *et al.*, 2013). During the extraction procedure the methods amalgam, that turns a stable methyl-mercury to a compound, and when digested, inhaled or absorbed turns to toxic to environment and man (Hilson, 2001). Ghana's small-scale mining sector uses mercury for their ore processing. These waste products are often dumped into the water bodies, which causes bioaccumulation

in the aquatic animals, and affect human food chain (Donkor et al., 2006). Exposure of mercury to human can cause respiratory, kidney problems, central nerve, cardiovascular system disorders psychosis, loss of memory, reproductive problems and most often causes complications in children and results to death.

2.8.3 Pollution of Water Bodies

According to Adetunde *et al.* (2014), gold mining communities' faces prevalent contamination of surface and ground water bodies in Ghana. Chemicals as sulphuric acid (H_2SO_4) or cyanide (CH^-) pollutes and occurs during the processing of ore leak, spill or leach from the processing area into nearby water bodies. Human, aquatic and wildlife are under threat of these chemicals. The clean water bodies, which serves as portable drinking in the mining communities, are under siege because of small-scale miners' ore waste washed into water bodies (Obiri et al., 2010). Mine tailing directed are into water bodies, and this introduces certain large number of suspended elements that contaminates the aquatic habitats (Serfa-Armah et al., 2006). Mine tailing poses serious health threats to human, animal and plant life because of its toxic nature (Hayford et al., 2009). A research done by Council for Scientific and Industrial Research in Ghana shows most of the communities in the Western Region are extremely prone to health-related problems due to small-scale mining operations, which is polluting these water bodies in the region (Yeboah, 2013).

2.8.4 Air

Quality of air is affected in all mining methods, when the unrefined materials are released or mined to the surface; the mineral deposits are expose from the site. In mining, the top soil is removed, which means that the vegetation is also gotten rid off and exposes the bare soil to harsh weather conditions. Toxic materials such as cadmium, lead and arsenic can be

unrefined. Human health maybe adversely affected by illness related respiratory system and emphysema through particles to the skin or ingested.

2.8.5 Biodiversity

The effects of mining activities are felt after the mining process has ceased. The destruction or drastic modification of the pre-mined landscape can have an enormous impact on the biodiversity of that area. Mining is a significant threat to biodiversity as it leads to large massive habitat losses, which affects microorganisms, vegetation, and animals. Temperature modifications or PH because of mining can disrupt the livelihood of the communities that live in proximity to the site. Endemic plant and animal species are affected most, since they are very sensitive, and they require specific environmental conditions, even the slightest disruption of their habitats can result in extinction or put them at high risk of wiped out. The level of concentration, extent, and the nature of the contaminant determine the effects of mining activities on the biodiversity of an area. There are species that are resistant to such disturbances while others are adversely affected to the extent of completely disappearing from the mining zone. A landscape affected by contaminants from mining sites can take a long time before they completely recover. Remediation processes do not offer any guarantees that the biodiversity of the land will recover as it were before the mining activity. Aquatic organisms are affected by the mining industry by direct poisoning.

www.worldatlas.com/articles/what-is-the-environmental-impact-of-the-mining-industry.html

2.8.6 Effects of mining on livelihoods

According to Akabzaa *et al.* (2005), huge farmlands cleared to pave way for small-scale mining and the needed compensations not paid and results in low crop production. These exploration lands are not reclaimed and left barren to lose its nutrient value for the agricultural purposes (Anane, 2003). The top soil and vegetation are cleared off and can support plant life

for production in these areas. High incidence of soil erosion, crops, fishes and vegetables farmed along the mining areas during the exploration have certain levels of mercury contamination.

2.9 Theoretical and Conceptual Framework

Most African faces serious livelihood challenges through mining, even though it brings social and economic benefits. The small-scale mining spillovers affects livelihood in the mining areas, which is extreme. Subsistence mining is a major livelihood in Ghana although it is illegal. The illegal small-scale mining will adopt Sustainable Livelihood Approach (SLA) in mining communities as a coping strategy. (It is based on evolving thinking about the way the poor and vulnerable live their lives and the importance of policies and institutions).

Di John (2010) asserts that negative development outcomes such as growth collapse, economic regression, high levels of corruption and ineffective governance can arise from huge availability of minerals and fuel in less developed countries. The resource curse theory suggests that the natural resources found in some developing countries are seen as a curse rather than blessing. The worse economic and political mess is experienced in mineral rich countries than non-rich natural resourced countries (Siegel, 2008). According to Van der Linde (1994), the Dutch disease, crowding out of human capital, rent seeking and crowding out of social capital is due to natural resource curse phenomenon. Dutch disease is another form of resource curse. In 1960, the economic concept called Dutch disease was coined in the Netherlands. The potential negatives from the Dutch disease and the natural resources windfalls and it exchange rate appreciation can impacted on an economy growth and possible after mouth dangers (Di John, 2010). Exports from other sectors of the Dutch economy became less competitive after discovery of the natural gas, which increased the value of the

currency. The revenues and resources made the real exchange rate appreciate in the economy as an outcome. According to Korhonen and Juurikkala (2007), the oil and gas revenue relationship with the exchange rate consistently, made it tough for countries finding same resource to accrue the foreign currency needed for trade. Many large countries that are rich might perform poorly upon the discovery of a highly valuable natural resource of which Netherlands situation was not unique (Auty and Gelb, 2001). Largely, natural resource existence is to promote development and economic growth, as it is a source of wealth (Collier, 2006). Rich natural resource countries as Malaysia, Thailand and Indonesia have proven that the resources can enhance economic growth and economic development as well (Demissie, 2014).

The Dutch disease theory can cause macroeconomic difficulties due to resource boom. The temporal increase in mineral resource discoveries is connected to resource boom. This research applies the resource tenet curse theory to ascertain how well-endowed resource can be expletive. The case of East Akyem District that is endowed with abundance of mineral wealth but illegal been mined due to enormous unemployment and poverty rates. The corrupt officials are easily bribed rather than spending on developmental projects and industries which affects development in the long run (Barbier, 2007),. The economic sector is crowd out with human and social capital due to abundance of natural resource (Demissie, 2014).

2.9.1 Sustainable Livelihood Approach

Sustainable Livelihood Approach (SLA) reinforces how illegal gold mining activities is a coping strategy in mining communities in Ghana. The unregulated, illegal small-scale mining “galamsey” has become subsistence and one of the most important forms of livelihood. The livelihood approach is a strategy in the area of poverty reduction and help to improve the lives of people who are entangled in poverty and its related issues. According British Department

of International Development, 70% of the world's poor people live in rural areas. The targets set in reducing the proportion of people living in extreme poverty by half can be achieved if they address the poverty around people living in rural areas. Understanding the coping strategies of people, the rural poor is through the sustainable livelihood approach. It considers the key features that affect the livelihoods of people and the common linkages between the features. These features include a framework in understanding the difficulties of poverty and a set of values to guide actions to address and overcome poverty. The approach can serve as a channel for working out measures that will improve the lives of the rural poor while attempting to understand the issue of poverty from their perspective. Other Non-Governmental Organizations such as CARE, Oxfam and United Nations Development Programs (UNDP) use these models in sustainable livelihoods to implement development program (Chambers and Conway, 1993).

2.9.2 Defining Livelihood

According to Oxford Dictionary (2010), defines livelihood as a means of securing the necessities of life. Illegal miners rely on the availability and accessibility of gold and other minerals in a particular area for their livelihood. Other authors have defined livelihood in different terms. In mid 1980s, Roberts Chambers pushed thoughts on livelihood into the spotlight. Improving development and eliminating poverty in underdeveloped countries is the main idea behind livelihoods. British Department of International Development (DFID) built on Chambers concept and Sustainable Livelihood Approach (SLA) was introduced in 1997. The focus of the British Department of International Development (DFID) is halving the number of people living on less than US\$1 a day by 2015 through a policy. Defining what is livelihood in any specific situation will continually open up a debate. Chamber and Conway (1992) have most well-known definitions of livelihood. They define livelihood as assets and

capabilities, that includes social resources and material as means to an end. Livelihood becomes sustainable if it can cope and be able to recover from stress and shocks.

Ian Scoones (1998) describes livelihoods as assets and capabilities, which comprises material and social resources and requires activities for living. Its sustainability depends on its ability to cope and recover from usages, while the natural resource base is not undermined.

According to Ashley and Carney (1999), priorities and scope for development as sustainable livelihood is to enhance elimination poverty. Ellis (1998) built upon Chambers and Conway's concept and defined livelihood in similar definition as natural assets, physical, human, financial capital and activities through social relations and institutions and determine individual or household living gained.

2.9.3 Livelihood Assets

Asset based livelihood is concept of several development approaches in reducing poverty. Sustainable Livelihood Approach explains that access to household's livelihoods assets varies, and demonstrate impeding factors or how enhanced opportunities in livelihoods are connected. The main principal livelihood assets entry point to Sustainable Livelihood Framework is the capital assets, which can accessed by the poor and controlled Serrat (2008). The capitals such as human and natural is available for the poor whilst financial and social capital is seen to be difficult in accessing. Priorities of the households determines whether some of the capital are clearly more relevant than others. Housing and land may be relevant to some households whilst others prefer the various social networks to make use of. The five main capital assets including Natural Capital – water, vegetation and the natural resource soil are essential for sustainable livelihoods ; Capital – the household make decisions in terms of investments in human natural and other forms of assets due to capital (cash, remittance, loan, credit and economic asset) ; Human Capital – livelihoods strategies successfully undertaken

differently through the skills and knowledge acquired, this allows the households to provide labour and good physical capability ; Physical Capital – basic infrastructure tools manufactured and needed goods produce to pursue livelihoods strategies and Social Capital – are social resources, affiliations, social claims and relations networks, which enable different livelihoods strategies to be pursued.

2.9.4 Small-scale illegal mining social features

The social effects of small-scale mining are increasingly receiving attention in recent times. The mining sector is undeniably a key propellant for an economic growth for the most endowed African countries such as Ghana. This is due to its potential to industrialization boost and job creation. It could also be a source of civil unrest, increase living cost, and social discontent. The cultural issues and social cost of mining calls for strenuous effort in addressing the menace. Migrant influx miners, communities' displacement, substance abuse high cost of living is some of the challenges facing small-scale mining in Ghana.

Mining deposits has displaced communities due to its exploration. Antwi-Boasiako (2003) asserts that fourteen (14) communities with a population of 30,000 inhabitants were displaced in 1990-1998 because of mining operations and investments in Tarkwa and its environs. The mining firms compensate the communities, and others relocate in search of farmlands. Relocation lead to cut of social ties, psychological problems and disturbance of communal spirit (Yirenkyi, 2008). Influx of displaced mass communities had a toil on the Tarkwa. Accommodation pressure and the number of unemployed youths increased largely because of these phenomena. According to Owusu & Dwomoh (2012) and Antwi-Boasiako, (2003), teenage pregnancy, truancy; drug trafficking, prostitution, and school dropout rates are some social issues that may possibly rise due to small-scale mining activities. According to International Institute for Environmental and Development (IIE, 2002) migration have a

significant effect on mining activities in mining communities, especially in our part of the world where mining is viable economic activity. A lot of youth influx to Konongo, Obuasi and Nkwakwa as result of mining. Meanwhile, people from the northeastern part of Ghana especially migrate to the south to seek for greener pastures. Small-scale gold miners' influx in Bolgatanga has brought new value for lands and changes to households.

Substance abuse

Substance abuse in the mining communities is on ascendency. The small-scale mining sector is gradually becoming synonymous with drugs and alcohol. There is high hope of these drugs stimulating them to work hard after consumed. According to Amponsah-Tawiah (2011), small-scale mining sector is too taxing, excessive physical exertion, and energy consuming, hazardous, and therefore high use of substance abuse such as marijuana, alcohol and cocaine. The workers in the sector face serious health-related issues like mental disorder and skin problems as result of the abuse of these drugs.

High cost of living

The non-mining communities are cheaper in terms cost of living than the mining communities that such costs are relatively high (Antwi, 2010). The price decider for goods and service in mining communities is pegged on the wages or incomes levels of the mineworkers at the neglect of non-miners. According to Akabzaa *et al.* (2001), salaries of Ghanaian staff in this sector and their related jobs are pegged in dollars and therefore, these workers received higher wages than the regular public sector worker. Furtherance, internationally competitive salaries are paid to these expatriate workers, which is almost about ten folds the salary of the average public worker. These income disparities favor those with high incomes earners in pricing of goods and services within the same community.

Health

According to Carolyn and Ahern (2001), the location of mines determines the health and safety risks, the product mined who is engaged in and the method been used in operations. Small-scale mining is categorize into deep and open cast mining. However, in all these mining operations the health risks occur unabatedly. The mining occupation is one of the most hazardous throughout the world. It causes both short and long-term injuries and fatalities, and comes with long term effects such as cancer and respiratory conditions, like silicosis, asbestosis and other severe diseases to miners and the surrounding communities (Stephen & Ahern, 2001).

Small-scale cause's health related problems for both miners and non-miners in the mining areas. Respiratory infections is problematic and most studied health effects for mining workers. Injuries continues to be relevant safety issues in mining communities. The long-terms effects of mining related diseases are cancers and mental health effects on miners. However, mining activities changes the environment through the open pits, which accumulates stagnant water that support malaria vector growth. Other health related diseases are occurred through small-scale mining includes skin diseases and Sexually Transmitted Disease (STD) and diarrhea (Hilson, 2001; Akabzaa & Dariman, 2001).

Water Pollution

Mining activities divert the watercourse, reduce water table from the mines. This operation has disruptive outcomes for quality and availability of surface and ground water. Pollution of surface and ground water in Tarkwa is based on concentration of mining activities. Four main problems of water pollution is this mining is identified as chemical pollution of ground water and streams, siltration through increase sediment load, increase faecal matter and dewatering impacts (Akabzaa & Draimani, 2001).

Dropout Rate

Thorsen (2012) an estimated third of children from west and central Africa are engaged in full time or part time, paid and unpaid. Most of these children are engaged in hazardous and harmful mining activities. Even though the work is not hazardous, many working children do not have access to education or have dropped out of school due to burden of keeping in school and out of work. Furtherance some do combine work and school in order to earn an income to continue their school. The hard physical work and long hours in the mining sites accounts for mostly for why children have difficulties in keeping or staying up with schoolwork.

Prostitution

Illegal small-scale mining increases social vices in these mining communities (Adu Gyamfi, Brenya & Abakah, 2016; Addai & Baiden, 2014, Eshun, 2005) the high rate of these social vices such as prostitution is the movement of people from different background and diverse values to the mining communities.

2.9.5 Small-scale Mining Economic Features.

The extractive sector has strong economic influence for Ghana and the South African mining sector, which 40% of their gold exports accounts for their export earnings (Tschakert & Singha, 2007). The sector provides huge employment to both informal and formal, locals and for foreigners alike. Revenues from the mining firms such as royalties, corporate tax and income tax are all earned from the mining sector.

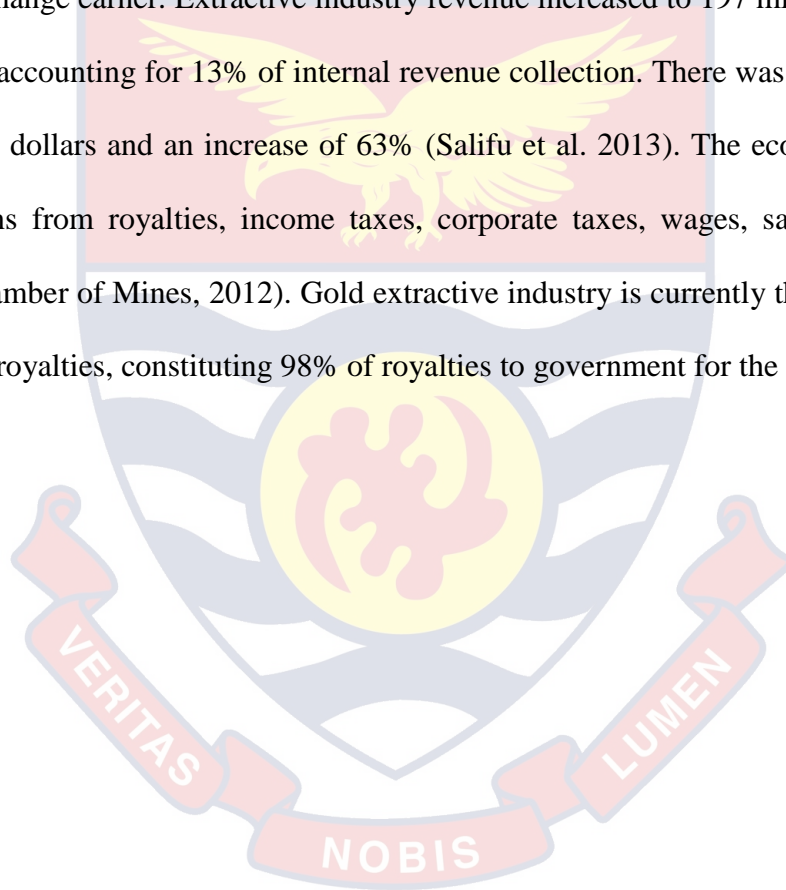
Employment

In 1987 - 1995, there was employment surge in formal employment figures from 15,000 and 22,000 according to Ghana Minerals Commission (2000) whilst the employment in the informal was twice in small-scale mining sector than the formal sector at the same time (Akabzaa et al.2001). Formal employment in the sector accounted for 10,624, and about 1.4%

of which are expatriates and the rest, Ghanaians. Salifu et al. (2013) asserts that exploration employees, mining supports services such as supplying raw materials to major mining firms, contractors and the registration of firms with the government institution such as Chamber of Mines.

Foreign exchange and Tax Revenues

In 2005 production of minerals appreciated, with gold becoming number one in terms of foreign exchange earner. Extractive industry revenue increased to 197 million dollars between 2004-2005 accounting for 13% of internal revenue collection. There was an export revenue of 173 million dollars and an increase of 63% (Salifu et al. 2013). The economy enjoyed some contributions from royalties, income taxes, corporate taxes, wages, salaries and dividends (Ghana Chamber of Mines, 2012). Gold extractive industry is currently the largest contributor in terms of royalties, constituting 98% of royalties to government for the last decade.



CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter describes the research procedure that will be adopted in carrying out this dissertation. The research involves the use of primary data collection questionnaire and come out with reliable information for data analysis. It defines the research setting, study instrument and data, adopts sampling technique data collection and handling, tools for data analysis and problems encountered.

3.2 Study Area

The East Akyem Municipality is located in the central part of the Eastern Region of Ghana. It has a total land area of approximately 732km² (Ghana Statistical Service, 2010), and lies within longitude 0°.56 West and 0°.15 West and latitude 6.03 North and 6°.35 North. It is bounded by six districts namely Kwahu South District to the North, Atiwa East and West Districts, Kwaebibirem District to the South-West, Fanteakwa District to the East, New Juabeng Municipal and Suhum-Kraboia-Coaltar Districts to the South. The capital of the East Akim Municipal Assembly is Kibi, which is 55km away from Koforidua, 105km from Accra and 179km from Kumasi and lies on the eastern slopes of the Atiwa Range. Important towns in the municipality that are equally of economic value are Old Tafo, Kukurantum, Apedwa, Osiem, Asiakwa, Asafo Nkuronso, Apapam, Maase, and Bunso (EAMA, 2006). Steep sloping ridges and undulating hills that rise about 240 to 300 meters above sea level characterize the topography of the East Akyem Municipal Assembly. The Atiwa range is the highest point in the area, which rises over 350 meters above sea level, about 50 km long and 10-15 km wide (Xtra-Gold Resources Corp., 2010; EAMA, 2006).

There are several different types of rock formations in this area which therefore results in different relief features. These features range from flat bottom valleys to steep-sided highlands, which are usually covered with iron pans, bauxite and kaolin. The underlying rocks are of the Birimian formation, covering over three-fourths of the closed forest zone. Tarkwaian rocks, a major source of gold, have also been found near Kyebi and other smaller towns in the Municipal Assembly. These rock groups contain several mineral deposits such as gold, diamond, bauxite and kaolin.

The west semi-equatorial climatic zone lies East Akyem District has a double rainfall pattern. The first raining season pattern starts from May to June and second season also starts in September to October. Annual rainfall is abundant with 1,500mm to 2,000mm for most of the areas and 2,000mm or more in the summit areas in the municipality. The mean annual rainfall ranges between 12500mm and 17500mm.

The dry seasons are distinct with the main season commencing in November and ending in late February. Throughout the year temperatures are uniform ranging 26°C in August and 30°C for March. Relative humidity is generally high throughout the year, ranging between 70% - 80% in the dry season and 75% - 80% in the wet season. The temperatures in the day range between 30°C – 35°C and are usually 23° - 28°C most evenings (Xtra-Gold Resources Corp., 2010). The major vegetation type in the region is the moist semi-deciduous forest. The Vegetation consists of low, thick bush, open canopy and deciduous trees, with few forest reserves 108.8 square kilometers covering which includes Atiwa forest reserve. The forest reserves constitute about 15% of the entire surface area of the Municipality. Some commercial species of trees contained in the forest are includes Odum, Wawa, Ofram, Mahogany, among others (EAMA, 2006).

The main occupation is farming which sixty-two (62%) of the population are into subsistent level of agriculture and thirty-eighty (38%) are also engaged in large-scale farming. Several mining firms such Paramount Mining Corporation, have been exploring in Kyebi for gold and other minerals such bauxite by Rusal which is world's second largest aluminum company and accounts for 9% primary aluminum and 9% of world's alumina production. The town is well noted for huge mining activities which has also led to contamination of Birim.

3.3 Research Design

The fundamental plan for research design is to explain and show how research questions will be linked to available data, tools, and methods in answering (Punch, 2005). According to Berg (2010) valid research yields good results consistently based on carefully design. However, for the purpose of this study, the mix method involving both qualitative and quantitative research approaches will be applied. These two concept compliments each other by enhancing the research design and the solidifying research findings. The use of these two concept or methods will provide detailed narratives and information to enhance results and findings of the study. This approach is very adequate for comprehensively addressing the complex research questions involved in this study.

3.4 Population

The population for the study is considered as the total number of units in the phenomenon to be investigated that exist in the research area. Kyebi is the administrative capital of East Akyem District. Two communities namely Kyebi and Apaapam will be selected for the research due to proximity of these communities in the catchment areas of the mines. These two communities will be selected because illegal mining is more pervasive in these

communities. The researcher will use sampling intervals in selecting fifty (50) respondents in each of the two communities based on 2010 Population and Housing Census (PHC). The researcher's population consist of Opinion leaders, illegal miners, students and residences for the research.

3.5 Sample and Sampling Size Techniques

The sample is usually small part of a large group from which information is obtained for actual investigation. The sample size is pegged at 100 respondents from the study area as defined earlier, for the purpose of this study. The sampling technique is the procedure or appropriate method used in the selection of a sample. Kumekpor (2002) suggested that the sampling techniques to be used for this study are simple random sampling and snowballing. Concerning simple random sampling, each member of the population stood an equal chance of being selected from the sample. The snow balling method helped to locate exactly where to find people who actively engaged in “Galamsey” activities without going through the whole town in search of them. Thirty respondents will be sampled using the simple random sampling technique, with 20 respondents sampled using the snowballing technique. The use of these sampling techniques ensured fairness and reduced bias in the selection and elimination of respondents. In total, a sample size of 100 will be selected for the study based on purposive sampling technique, which is used to select deliberate choice of respondents on basis of informant qualities (Tongco, 2007).

3.6 Source of Data

In research gathering data is crucial it is meant to contribute to a better understanding of a theoretical framework that is been applied in a study (Bernard, 2002). It is imperative that

selecting the manner of obtaining data or acquiring data is done appropriately and with a sound judgment. This is necessary in data collection procedures because no amount of analysis can make up for improperly collected data. In data collection processes, it is important to consider what methods are available to gather the original data from respondents. The primary sources of data collection will be based on empirical information through an intensive fieldwork in the East Akyem District by the use of questionnaire survey. The selected mining areas in the studied community will be visited and questionnaires distributed to elicit information on the illegal small-scale mining activities. In-depth interviews and focus group discussions would be conducted with the opinion leaders and other in the community to gather more information.

3.7 Instrument for Data Collection

Questionnaire was the main instrument that will be used for the collection of data. The questionnaires when collected would be the methods of obtaining desired information for such purposes. Questionnaire would be effective and reliable way of gathering primary data. Transcripts of the interview sessions as well as focus group discussions will be analyzed alongside the questionnaire.

3.8 Instrument for Validity

The use of questionnaire is one of the reliable and valid means of gathering information from selected respondents for research. The questionnaire is structured to meet the purpose of research objective. In order for accuracy, the language used was simple so that residents affected by this illegal small-scale mining would be able to read and understand easily. It was

evident that affected areas were accustomed with the impact of illegal small-scale mining on their livelihoods and therefore give accurate answers to the posed questions.

3.9 Data Collection Method

Structured questionnaires prepared in line with the objective of the study will be administered to community members. The questionnaire will be administered to illegal miners, students and residents to generate relevant information for the study. The researcher may personally deliver and collect questionnaires. The questionnaire will be made simple and easy to answer.

3.10 Method of Data Analysis

The data elicited through the distribution of questionnaire will be statistically analyzed and presented using the Statistical Package for Science and Software (SPSS v. 20).

3.11 Ethical Consideration

The researcher will follow the ethical principles to safeguard the dignity, rights, safety of all the respondents for the study. These measures such as objectiveness, fairness and the privacy will be strictly adhered to. The respondents will be informed of their reserve rights to terminate without paying penalty at any point in time. Information collected from respondents will be handled in professional manner, and respondents will be told not write their names on the questionnaires. The benefits of this research will be explained to the respondents at the end of the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter provides empirical evidence on the impact of illegal small-scale mining on the livelihood of residents of East Akyem District. This also however outlines the summary of major findings from the analyzed data and makes policy recommendations on the way forward to ameliorating the challenges face in the illegal vigorous mining activities in the study area as identified by the study.

4.2 Demographic Data

Most of the study participants 83% were males and 17% were females. Thus, more males were present in this study than females looking at the labor-intensive nature of the job. As such, more strength and energy is required making males more suited for this kind of role. This is consistent with the findings of Aryee (2012), that illegal small-scale mining is dominated by men. This is shown in Table 4.1.

Table 4.1: Gender Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	83	83%
Female	17	17%
Total	100	100%

Close to half (46%) were within the ages of 21-30 years, followed by 20 percent who are ages in of 15 -20 years. This population are the very vibrant and energetic in the community. They

also form the active working force. The strife to make more money to satisfy their youthful gratification. About 18 percent of the respondents were within the ages of 31-40 years. These age ranges is classified, as a youthful hence it is not surprising to see them at actively involved in the mining activity. Significantly, only few people of age 40 and above are involved directly in the mining activities. They could be more business owner within this age range and also because they have minimal strength and ill health, they could not be involved in the active mining. This is shown in Table 4.2.

Table 4.2: Age distribution of Respondents

Age (Years)	Frequency	Percentage (%)
15-20	20	20%
21-30	46	46%
31-40	18	18%
41-50	7	7%
Above 51	9	9%
Total	100	100%

From the data set, it has been revealed that majority of the miners depicted by 61 % of respondents were single. This is very prominent because most of them were within the ages of 15-30 years old. Within this age range, most of them probably did not have enough reasons to settle in marriage. Because of the high incidence of prostitution and school dropout in the community, most of them probably had their sexually satisfaction from other means rather than having to settle down in marriage. About 36 % of miners in this study were married; these were mainly those within the 31-50 years range. Indicating that they were probably

more need for them to settle and have families as compared to those within the younger age bracket. Only few miners in this study were divorced and separated in this study. This is shown in Table 4.3

Table 4.3: Marital Status of Respondents

Marital Status	Frequency	Percentage (%)
Single	61	61%
Married	36	36%
Divorced	2	2%
Separated	1	1%
Total	100	100%

Most of the people in this study have had at least elementary education, followed by those who have had secondary and tertiary education. This is significant to inform their decision on illegal mining; however, we see that this educational background does not drive their concern to preserve the community. It could be more about economic gains for them to undertake such mining activities. Only few of them participants had no education. This is in consistent with (Tschakert, 2009 & Heemskerk, 2005) microeconomic reasons pushes people to take up mining, particularly with the high price for gold, inability to find other work, the inadequate pay of other available jobs, and the low educational status of many, which limits access to better paying jobs. Hilson (2010), makes same assertion people undertake illegal mining base on poverty and unemployment. Low standard of living and working age group producing a livelihood for themselves and dependents, which is a fundamental reality that motivates people to engaged in illegal small-scale mining. This is shown in table 4.4 below.

Table 4.4 Educational Level of respondents

Educational Level	Frequency	Percentage (%)
Tertiary	38	38%
Sec/ Tech/ Voc	41	41%
JHS/ Middle School	17	17%
No Education	4	4%
Total	100	100%

Primarily, most of the respondents in this study are engaged in either one or more jobs. Probably they are not generating enough revenue from one job. Its therefore becomes enticing for them to enroll onto other lucrative alternatives such as illegal mining to earn more money. This is in consonance with findings by Hilson *et al.* (2013) that the miners in the mining areas engaged in the mining to supplement incomes from agricultural and other livelihood alternatives. Majority of the respondents seem to engage in trading followed by farming. Farming and trading are more classified as unskilled jobs, as such no primary apprenticeship is required to learn the vocation so majority seem to be involved. However, for vocations such as driving, tailor and carpentry only a few are engaged in such businesses since it requires apprenticeship. In addition, it could that carpentry; seamstress and driving are not very lucrative compared to trading and other jobs taking into consideration the standard and cost of living in the community. For example, people will prefer to walk than to board a vehicle hence drivers would not potentially make more money. See Table 4.5.

Table 4.5: Occupational Background of Respondents

Occupation	Frequency	Percentage (%)
Farming	19	19%
Driving	7	7%
Seamstress	1	1%
Carpentry	2	2%
Trading	34	34%
Others	37	37%
Total	100	100%

4.3 Effect of Illegal Small-Scale mining on the Community

About 87.7 % of the respondents of this study alluded to the fact that they knew about illegal small-scale mining and the impact it was having on the community. Most people in the community indicated that had lost most of their lands and because of illegal mining. This confirms findings of Tetteh (2010), most mining concessions are located in and around forest, agricultural lands and human settlements, which results in competition for land and deprived access to farmlands. Some of the natives indicated that since their lands were close to the riverbanks, they lost their land due to the activities of the miners. In addition, the miners encroach people lands for their day-to-day activities. Indirectly, people have also lost the fertility of their land for farming and as such, they have to relocate their farms, which negatively affects them. On the contrary, some people express their thoughts on the fact that they had not really had issues with mining activities, which caused them to personally lose their lands but agree with the fact that activities cause, land loss and harm.

Similar in assertion by Aragon and Rud (2012) that illegal small-scale mining in large extent is associated with negative effect on farming, land pollution, land grabbing and having direct impact on rural income and living. The impact of illegal small-scale mining on the local economy of the community as described by the participants were nearly neutral. Where some strongly suggested that, the mining activities caused no improvement in the local economy others also thought otherwise with justifiable reasons. About 50.5 % of the respondents were of the opinion that the mining activity had not improved the local economy but rather caused more harm to the already struggling local economy for reasons including the fact that the mining activities causes a devastation of arable lands, farmlands and river bodies. Presentation of this can be found in *Appendix II: Image 1*.

The excavation of the land with heavy equipment turn to form large pits and holes on the land and scrapping of the top soil, which is very important for agricultural activities. This confirms a study finding of Offei-Aboagye et al. (2004) assertion that small-scale mining in Ghana has been destructive to the lithosphere; the hydrosphere and the atmosphere of these mining communities are located (Offei-Aboagye *et al.* 2004).

Furthermore, the respondents stated that the community has remain poorer since the incidence of the illegal mining began in the community due to the fact that the chief operators are not native of the town most of the revenue generated from the mining activities are not spent in the town increasing the standard and cost of living in the community. The low productivity in agriculture in the community due to the destruction of farmlands have also caused the high cost of living in the town. There is evidence to suggest that most of the lead operators engaged in the illegal mining are not natives of the community as such do not really care about the livelihood and conservation of the resources of the community. This is in consistent with argument one of the negative effects of illegal small-scale mining is high cost of living in

mining areas (Yakovleva, 2007). As the activities, attract people from different parts of the world to the mining communities (Burrows and Bird, 2017).

On the other hand, almost half (49.5%) of the respondents think that the activities of the mining had no adverse effect of the community. In view of this, they suggest that the activity rather creates employment opportunities for the people in the community and promote inter-trade business activities as well. See Table 4.6.

Table 4.6: Summary of the opinion of respondents on the effect of illegal mining

Effects Of Illegal Small-Scale Mining	Responses (%)		
	Yes	No	I don't know
Do you have any idea about illegal small-scale mining?	87.7	12.3	0
Have you lost a land because of illegal mining?	30.9	67.0	2.1
Has illegal mining improved the local economy?	49.5	50.5	0
Are there any health implications relating to illegal mining?	76.3	14.0	9.7
Do you think illegal mining is helping the community?	48.5	50.5	1.1

Concerning the health implications associated with illegal small-scale mining, 76.3 percent of the respondent ascertain to the fact that there were enormous health challenges facing residents in the community due the events of this menace where as 14 percent of the respondents also expressed their view that mining activities had no impact on the health of resident. Surprisingly, 9.7 % of the respondents in this study did not seem to have a stand on whether or not the activities of mining posed health challenges or not. The adverse effects of

these mining activities on the health of the residents in the community were attributed to several factors as stated by the respondents. The indicated that the poisonous chemicals and substances used during the mining contaminate the water bodies thus affect the safety of portable drinking water. In addition, uncovered pits filled with stagnant water served as breeding sites for mosquitoes and other infectious disease-causing vectors, which has led to the alarming increase in malaria cases threatening the lives of children and even the adults. This is in consistent with (Hilson, 2001) findings that the excavated trenches are unsuitable for any purpose rather become a breeding area for malaria –infested mosquitoes and filled with stagnant water resulting in disproportionate damage to land. The respondents stated incidence of respiratory disease including flu and lung cancer as another major health plight they were exposed to. Due to the contamination of the water used by residence to perform domestic chores and bath themselves, they complained of skin rashes and other illness associated with the use of polluted water by mercury and other contaminants. The transmission of airborne disease are hug problems for the people as well. Furthermore, respondents as have reported pre-mature death occurrences because of the unsafe nature mining activities. This is in line with findings Colina (2006) Cyanide stops the transfer of oxygen from the blood to the tissues. Signs and symptoms of cyanide poisoning include rapid breathing, tremors, gasping, convulsions and death. Mild poisoning manifests in headache, dizziness and thyroid enlargement.

The respondents seem to agree strongly with the negative impact of the mining activities in the community (Table 4.7). There incidence of this mining seems to promote some social vices prostitution, drug abuse and school dropout as testified by the respondents. It also in line with findings (Adu-Gyamfi, Brenya and Abakah 2016; Addai and Baiden, 2014, Eshun 2005) illegal small-scale mining increases social vices in the mining communities. This cements the

earlier assertion that most of the youthful age group get their sexual and emotional need from other sources other than the need to marry and settle down. In addition, the abuse of drugs could contribute to the cause of the respiratory disease disorders mentioned earlier as a health challenge in the community.

Table 4.7: Summary of the opinion of respondents on the effect on illegal mining on the community

Some Effects Of Illegal Mining	SD	% OF RESPONDENTS			
		D	A	SA	
Illegal mining has increased drug abuse	2	19.2	20.2	58.6	
Illegal mining has increased prostitution	5.1	18.2	15.2	61.6	
Illegal mining has polluted the water bodies	0	3	15.2	81.8	
Illegal mining has reduced the size of arable lands	4	2	13.1	80.8	
Illegal mining has increased school out rate	4.2	11.5	19.8	64.6	

SD - Strongly disagree, D - disagree, A - Agree, SA - Strongly Agree

4.4 Livelihood and Coping Strategy

Surprisingly, there was no significant difference in the number of respondents who thought the activities of illegal mining did or did not improve their livelihood as a community thus as 50.5 % of the agreed that illegal mining had improved the standard of living 49.5 % suggested otherwise. This is shown in table 4.7. Some respondents stated that illegal small-scale mining provided a suitable alternative employment opportunity for them to generate income to be able to cater for their needs. This is in consistent with assertion Hilson and Potter (2005) illegal small-scale mining is a source of livelihood, which is fueled on high levels of

unemployment. For others, the nature of the mining job enhanced trading activity in the community which most of them took advantage off. However, some of the respondents expressed that the mining activities was acting as a “necessary evil” in that it was causing more harm than good. Despite the fact that the mining seems to have provide alternative livelihood means for the people it had cause a lot of other socio-economic and health related problems that need to be addressed.

By this study, respondents have indicated some coping strategies that they had adapted to in order to be able to meet up with the demands of this illegal small-scale mining and sustain their livelihoods. Some of the strategies include the taking advantage of the active trading and movement of people to buy and sell their produce even to neighboring towns and villages. Some indulge in petty trading as their primary source of livelihood. However, some respondents indicated that most of the revenue were been generated by the miners and not by the local natives who were not involved in the mining business. Those who were not involved in the mining business really complained of having difficult times in the community.

Unfortunately, mining activities around the study area has caused the reduction in the available arable lands from farming due to encroachment by miners. In addition, the toxicity of the chemicals used for mining has affected the fertility of the land thus reducing the quality and yield of farm produce. The low productivity of quality farm produce was due to the reduction in quality water for irrigation purposes as well as the high cost of regaining soil fertility through the purchase of fertilizers. Furthermore, since most of the farmers claimed to have lost their lands, the overall turnover of farm produce within the community had reduced significantly. This ultimately have affected the livelihood of the residence in the community. See Table 4.8.

Table 4.8: Summary of the opinion of respondents on the livelihood and coping strategies

Livelihood And Coping Strategies	Responses (%)	
	Yes	No
Has illegal mining improved the standard of living in the community?	50.5	49.5
Does it support farming?	20.4	79.6
Has the activities of illegal mining affected your farming?	69.4	30.6
Has illegal mining affected your farm produce?	71.9	28.1

4.5 Measure to Deal with Illegal Small-Scale Mining by Community Members

One of the strategies to deal with the issues of illegal mining in the community is the proactive step of residents to report the grievances to the higher authorities namely cheerleaders, assembly man/woman, member of parliament to be channels to appropriate governmental policy makers. Pragmatic actions by state officials and policy makers to address and implement policies to tackle the issues menace of illegal mining is a key determinant for the successful termination of illegal mining activities nationally. By this study, about 59.8 % of respondents, indicated that they reported the issues and activities of illegal miners to higher authorities such as assemblymen, traditional rulers, municipal chief executives among others, however, most of their complaints were not or having being dealt with yet. It was seen that, most of the residents had lost hope in the authorities and security service providers due to the high incidence of bribery and corruption. This is in conclusion with literature Abdulai (2017) alleged that persons with authority secretly promote illegal small-scale mining in mining communities due to the benefits that they accrue from them.

Additionally, the owners of the lands had sold the lands to rich illegal mining operators to carry out their activities as such they cannot go after their activities even if they felt their activities were being detrimental. This was supported by the fact that 76.3 % of respondents in this study stated that they were serious issues that arise when the concerns of reclaim of land were raised. Most of the landowners lose their land in the process due to the high cost involved. This support the assertion by Donkor et al. (2006) in most small-scale mining areas open dug pits are not reclaimed and vegetated areas are not regraded, which induced erosion and subsequent siltation. Initial action by the police to arrest the perpetrators of the illegal mining had drastically reduced in recent time as this was of major concern to the respondents. Some security agencies were applauded for their efforts to deal with illegal miners.

The long-term effect of illegal mining activities and process on the livelihood, health and environments of the communities in which these activities are carried out are enormous. It supports Djurfeldt *et al.* (2005) the argument that the result of activities of illegal small-scale mining is enormous on the environment. The incidence of water pollution, loss of farmlands, health related issues due to the use of toxic chemicals and spread of malaria and other diseases, migration, high incidence of social vices such as drug abuse and prostitution are one that pose a threat to the socio-economic stability of the nation at large. It is therefore imperative that drastic measures are put in place to be able to eliminate these inappropriate mining activities.

Respondents in this study suggested some of their point of view on how this unfortunate incidence could be curtailed. The creation of employment opportunities for the youth was noted as a main way to keep the youth away from this illegal mining. Since the unemployment issues among the youth are higher is had driven more if them into this alternative means of making jobs. This supports the work by Geenen (2012) which contend

failure of the state to provide support make them engaged in illegally mining as a way of making a living in an environment where there are virtually no jobs available

Development of programs that will equip the youth with a vocation or a trade will be very critical to providing them with alternatives other than illegal mining which tends to jeopardize their respective lives. Furthermore, the formulation and implementation of appropriate policies against illegal mining are proposed as a very systematic way of dealing with this issue. The police and other security agencies are required to be firm and devoid of bribery and corruption. The fairness of the dealings of the security agencies will be very useful to stop the influence of rich illegal miners when they have been apprehended for their acts. Some respondents also advocated for the massive support by the Ghana Armed forces in the fight against illegal mining and enforcement of mining acts. All perpetrators should be punished appropriately devoid of any influence. The activities of miners in Ghana need to be licensed, regulated and controlled. The ban on illegal mining must be enacted by parliament so that all such activities will strongly be protested. See Table 4.9.

Table 4.9: Summary of the opinion of respondents on measures to deal with small-scale illegal mining

Measures To Deal With Illegal Small-Scale Mining By Community	RESPONSES (%)		
	Yes	No	I don't know
Do you report illegal mining activities to the high authorities?	59.8	40.2	0
Are the reported illegal mining activities dealt with?	33.7	66.3	2.1
Are the lands reclaimed after the illegal mining activities?	49.5	50.5	0
Are you aware of long-term effects of illegal mining?	76.3	14.0	9.7

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter seeks to presents a summary of the study, draw logical conclusion and suggest relevant recommendation stakeholders in reducing the impact of illegal small-scale mining on their livelihood.

5.2 Summary

The study observed that there were significant number of men who were engaged in the illegal small-scale mining compared to their female counterparts. This observation confirmed the opinion that the illegal mining small-scale activities is male dominated and lack of employment opportunities force the youth to involved in the illegal activities.

The study found that the sizes of farmlands have shrunk as results of illegal mining activities or operations. The illegal miners encroached lands under cultivations forcible without any regard for the owners.

Illegal small-scale mining operations have negatively affected the quality of water bodies in these communities. The research observed that surrounding water bodies have been contaminated or polluted through the operations of these illegal miners. Crops cultivated in this research mining site area have all been affected which is important to the national food baskets.

However, the illegal mining is in its highest spate currently in Ghana, it also waning the crop production in this community and quality of agricultural soils is depleting due to chemicals used in exploration of the minerals in these areas.

5.3 Conclusions

Based on the study it could be concluded illegal small-scale mining adversely affect the livelihood of residents and environment in the East Akyem District. Primarily, effects such as increased in social vices including prostitution, school drop-out and drug abuse were recorded as well as the negative impact of illegal mining activities on the fertility and size of the arable lands within the community. In addition, the water bodies were greatly contaminated by the activities of illegal miners. In addition, farming activities were hampered due to the encroachment of farming sites by miner.

Furthermore, efforts and strategies to adapt to this menace by the people of East Akyem District included reporting the issues to the local and regional authorities as well as security services. However, minimal action was taken by these opinion leaders to curtail the operations of the illegal miners. There were also difficulties in reclaiming the land that were lost due to the activities of illegal miners causing the residents to switch to alternative sources of livelihood such as carpentry and in worse cases some of the join the illegal mining operators.

5.4 Recommendations

The study provides the following recommendations, which is friendlier in controlling the illegal mining in East Akyem Municipality:

- 1 Educating parents to appreciate the value of formal education to encourage their ward to stay in school
- 2 Intense public education and sensitization about the serious consequences of illegal mining operations, for the effectiveness the local authority and traditional must be in constant dialogue with members of the communities. This is due to the privilege

position they occupied to interact with the community members rather than security taskforce.

- 3 Making license acquisition for small-scale mining less bureaucratic by the agencies in charge of issuing licenses, and helping the illegal miners form co-operatives groups to acquire license which can be regulated by Environmental Protection Agency and Minerals Commission
- 4 Scholarship should be available for the needy children to enable to them further their education rather depending on illegal mining as a source of income to finance their education
- 5 Create alternative livelihood opportunities so that indigenes are not driven to engage in illegal mining practices, providing economic opportunities to rural communities is a solution that has a lasting impact. Growth in non-mining sectors of the economy create alternative employment opportunities in rural areas, and encourages the migration of labor out of illegal mining.
- 6 Establish a task force to crackdown on illegal mining. The creation of a well-trained, mining-focused task force to enforce the ban on illegal mining. Identify and protect areas most susceptible to illegal mining activities
- 7 Because illegal mining generally occurs in improperly manner governments can implement intermediate and permanent measures to manage these sites and coordinate long-term monitoring systems. This area can be designated 'high risk zones' and as such their access restricted.

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APPENDIX I

RESEARCH QUESTIONNAIRE

Presbyterian University College, Ghana

Faculty of Development Studies

M.A. International Development Studies

This is a questionnaire to solicit information to complete my research title “Impact of illegal small-scale mining on the livelihoods of residents of East Akyem District”. Kindly spend 20 minutes of your time to provide the appropriate answers. You are assured that the responses will solely be used for academic purposes and treated with the highest sense of confidentiality.

Please tick where applicable

BIOGRAPHIC DATA

1. Sex of respondent

a. Male [] b. Female []

2. Age

a. 15-20 [] b. 21-30 [] c. 31-40 [] d. 41-50 [] e. 51 above []

3. Marital status

a. Single [] b. Married [] c. Divorced [] d. Widow [] e. Widower [] f. Separated []

4. Educational Background

a. Tertiary [] b. Sec/Tech/ Voc [] c. JHS/Middle School [] d. No Education []

5. What occupation category do you belong to?

A. Farming [] B. Driving [] c. Seamstress [] e. Carpentry [] f. Trading [] g. Other.....

EFFECTS OF ILLEGAL SMALL-SCALE MINING

6. Do you have any idea about illegal small-scale mining?

a. Yes [] b. No [] c. If Yes what is illegal small-scale mining

a. Mechanizing mining with registration [] b. Engaging in mining with right permit []

c. Engaging in mining without properly registered [] d. Not sure []

7. Have you lost a land because of illegal mining?

a. Yes [] b. No [] c. If No provide explanation.....

8. Has illegal mining improved the local economy?

A. Yes [] b. No [] c. If No specify.....

9. Are there any health implications relating to illegal mining?

a. Yes [] b. No [] c. I do know [] c. If Yes specify.....

10. Do you think illegal mining is helping the community? a. Yes [] c. No []

If Yes explain

LIVELIHOOD AND COPING STRATEGIES

11. Has illegal mining improved the standard of living in the community?

a. Yes [] b. No [] c. Explanation.....

12 How do you cope with illegal mining in your community.....

Please use each of the statement below, to indicate your agreement or disagreement by placing a tick

I Disagree=ID, Strongly Disagree, Agree=A, Strongly Agree=SA

	ID	SD	A	SA
Illegal mining has increased drug abuse				
Illegal has increased school dropout rate				
Illegal mining has increased prostitution				
Illegal mining has polluted your water bodies				
Illegal mining has reduced the size of arable lands for farming				

13. Does it support farming?

a. Yes [] b. No [] c. If No specify.....

14. Has the activities of illegal mining affected your farming?

a. Yes [] b. No [] C. If Yes explain.....

15. Has illegal mining affected your farm produce?

a. Yes [] b. No [] c. If Yes specify.....

MEASURES TO DEAL WITH ILLEGAL SMALL-SCALE MINING BY COMMUNITY MEMBERS

16. Do you report illegal mining activities to the high authorities?

A. Yes [] B. No [] c. Provide explanation.....

17. Are the reported illegal mining activities dealt with?

a. Yes [] b. No c. How/Why.....

18. Are the lands reclaimed after the illegal mining activities?

a. Yes [] b. No [] c. If No specify.....

19. Are you aware of long-term effects of illegal mining?

a. Yes [] b. No [] c. If Yes specify.....

20. What should be done to stop illegal mining?

.....



