

**SUSTAINING LIVELIHOODS IN ARTISANAL SMALL-SCALE MINING  
COMMUNITIES IN THE TARKWA-NSUAEM MUNICIPALITY**

**BY**

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A Thesis submitted to the Department of Planning, Kwame  
Nkrumah University of Science and Technology, Kumasi  
in partial fulfilment of the requirements for the degree of

**DOCTOR OF PHILOSOPHY  
IN PLANNING**

Department of Planning  
College of Architecture and Planning

September, 2012



## ABSTRACT

The termination of mining activities resulting from the exhaustion of mineral resources usually kill the local economies of mining communities and ultimately impoverish the inhabitants of the affected communities. Underpinned by this, sustainable livelihoods in artisanal small-scale mining communities has assumed prominence in international and national discourses. The purpose of this study was to explore ways of sustaining livelihoods in the artisanal small-scale mining communities within the Tarkwa-Nsuaem Municipality (TNM).

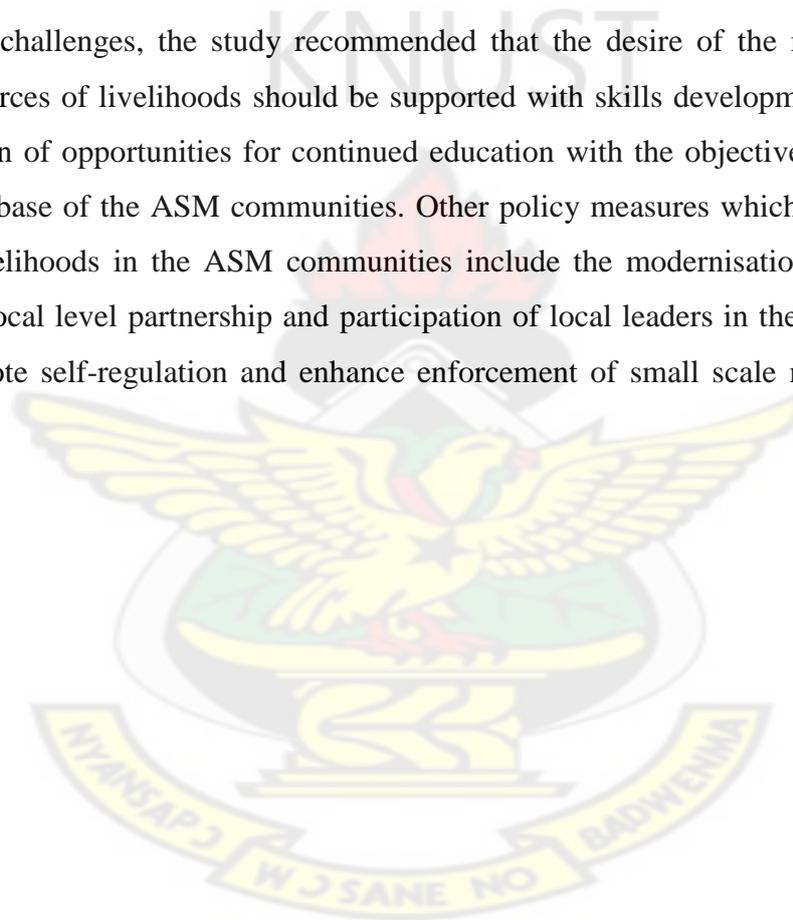
The study used complementary data from secondary and primary sources to answer the research questions. The secondary data obtained from scholarly works such as peer-reviewed journals and conferences, books and unpublished documents provided the theoretical and conceptual frameworks for the concept of sustainable livelihoods which underpinned the subject of investigation. The primary data were obtained from a sample of 400 household heads, 19 institutions, six Artisanal and Small-scale Mining (ASM) firms (four unlicensed and two licensed) and two mineral processing companies all from the Tarkwa-Nsuaem Municipality. The other sources of primary data were two local gold buying agents, traditional authorities and workers of the ASM firms.

Analyses of the data revealed that 50.50 percent of the household heads covered in the survey were miners with only 25 percent of them employed in the Large Scale Mining (LSM) firms. The remaining 75 percent of the miners were engaged by ASM firms operating within the mining communities. The dominance of the ASM activities was partly explained by the lack of the requisite skills on the part of the ASM workers to be engaged by the LSM companies coupled with the ease of entry into the ASM sector. The miners were the highest income earners in the communities; earning an average of GH¢195.55 per month which was 14.8 percent higher than the average monthly income of GH¢170. The relatively high turnover from the ASM activities also offers an explanation for the dominance of the mining activities in the municipality. The study also identified that the mining chain, from extraction through processing to sale, is a major source of livelihood to the labour force of the mining communities.

Despite the high returns from the mining activities, access to land for other economic activities which could have sustained households' livelihoods has been difficult. Lands have

also been rendered unproductive due to the inability of the dominant ASM firms to reclaim the lands after mining. The large concessions operated on by the LSM firms have contributed to making access to land difficult. Furthermore, the ASM do not offer workers any protective clothings and insurance. The workers' exposure to cyanide and mercury makes them vulnerable to all manner of health risks which is a threat to the sustenance of livelihoods. Owing to the unsustainable nature of the mining activities, 69.2 percent of the miners have invested their incomes in other income generating activities such as farming (53.1 percent), trading (45.1 percent) and fishing (1.8 percent).

Following the challenges, the study recommended that the desire of the miners for more sustainable sources of livelihoods should be supported with skills development programmes and the creation of opportunities for continued education with the objective of building the human capital base of the ASM communities. Other policy measures which could engender sustainable livelihoods in the ASM communities include the modernisation of agriculture, promotion of local level partnership and participation of local leaders in the management of ASM to promote self-regulation and enhance enforcement of small scale mining laws and regulations.



## ACKNOWLEDGEMENT

I would like to express my gratitude and appreciation to all the people who contributed in various ways to the successful completion of this work. I am most grateful to God for his guidance and grace through all the stages of this work.

My sincere thanks go to Dr. Imoro Braimah for his useful suggestions and directions which contributed to shaping the thesis. I am also indebted to the heads of various institutions, departments and agencies in the Tarkwa-Nsuaem Municipality who contributed in various ways to the execution this work. I am particularly grateful to Mrs. Christina Cobbinah (Municipal Chief Executive), Professor Sule AL-Hassn and Professor Amankwa (University of Mines and Technology), Mr. Emmanuel Sandow Ali (Environmental Protection Agency), Nana Koantwi (Municipal Planning Officer), Mr. Nyamekye (GGL) and Mr. Malcom Yendaw. I am also grateful to Mr. Ben Ntibiri of the Minerals Commission, Mr. Ngoah (Municipal Health Statistician), Mr and Mrs. Adai (UMAT) and all the Assembly Members contacted for responses to answer the research questions. I am also grateful to the owners and workers of the studied ASM companies, Licensed Buying Agencies, Processing Companies as well as the household heads who were interviewed.

My sincere thanks go to Professors K. K. Adarkwa, Kasim Kasanga, and Drs. Inkoom and Bugri for their encouragement that kept me moving even in the difficult time. May the Almighty God bless them. My sincere thanks also go to all Staff of the Department of Planning, KNUST who encouraged and helped me in various ways to complete the study. I am also grateful to the Late Dr. J.Y. Kokor who was my initial supervisor. I am most grateful to Mrs. Gifty Adom-Asamoah and Drs. K. D. Kessey, Poku-Boansi, Owusu-Ansah, Eric Oduro-Ofori, Charles Oduro and Mr. Owusu Amponsah and Mrs D. Adai. I am also grateful to the Teaching Assistants who worked with me throughout the period of the research; Miss Millicent Akaateba Awiale and Messers Bismark Asante, Elijah Yeboah, Michael Odei Ediaw, Seth Opoku Mensah, Stephen Diko, Emmanuel Otutei and Ishak Mohammed.

I am also grateful to Mr. Armah Nyameke and all those who helped in the data collection. I thank my husband Mr. Baah-Ennumh, my children; Lois, Kwame and Papa Yaw. I also thank my father, Mr. T. B. K Minnah and my siblings George and Gladys for the support they gave me throughout the research period.

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## LIST OF ABBREVIATIONS

AMG	African Manganese Group
AMSECS	Agricultural Mechanisation Service Centres
AIDS	Acquired Immune Deficiency Syndrome
ASM	Artisanal and Small scale Mining
BGS	British Geological Survey
BLS	Bureau of Labour Statistics
CBMS	Community Based Management Systems
CEDECOM	Central Regional Development Commission
CEPS	Customs Excise and Preventive service
CSR	Corporate Social Responsibility
DFID	Department for International Development's Framework
DSSMC	District Small-scale Mining Centres
ERP	Economic Recovery Programme
EPA	Environmental Protection Agency
EIA	Environmental Impact Assessment
EIR	Extractive Industries Review
FBOs	Farmer Based Organisations
FDI	Foreign Direct Investment
GBC	Ghana Bauxite company
GCAP	Ghana Commercial Agriculture Project
GES	Ghana Education Service
GSS	Ghana Statistical Service
GSD	Geological Survey Department
GSTDP	Ghana Skills and Technology Development Project
GDP	Gross Domestic Product
GPRTU	Ghana Private Road and Transport Union
GTZ	German Gellschaft fur Technishe Zusammenarbeit
GOG	Government of Ghana
GNMC	Ghana National Manganese Corperation
HDI	Human Development Index
HLS	Household Livelihood Security
ICMM	International Council on Mining and Metals

IDS	Institute for Development Studies
IFAD	International Fund for Agricultural Development
IFC	International Financial Corporation
IMF	International Monetary Fund
IIED	International Institute for Environment and Development
ILO	International Labour Organisation
ITDG	Intermediate Technology Development Group
JHS	Junior High School
LBAAs	Licensed Buying Agencies
LED	Local Economic Development
LPG	Liquefied Petroleum Gas
LSM	Large Scale Mining
NVTI	National Vocational Training Institute
MDGs	Millennium Development Goals
MDF	Minerals Development Fund
MDPI	Management Development and Productivity Institute
MMDAs	Metropolitan, Municipal and District Assemblies
MTDP	Medium Term Development Plan
MOWAC	Ministry of Women and Children's Affairs
NGOs	Non-Governmental Organisations
NSDSs	National Sustainable Development Strategies
OASL	Office of the Administrator of Stool Lands
OIC-G	Opportunities Industrialisation Centre-Ghana
OPD	Out Patient Department
PNG	Papua New Guinea
PAPSL	Participatory Assessment and Planning for Sustainable Livelihood
PMMC	Precious Minerals Marketing Corporation
PNDCL	Provisional National Defence Council Law
PSSMP	Promotion of Small Scale Mining Project
RLSA	Rapid and Participatory Livelihood Security Assessments
SGMC	State Gold Mining Corporation
SHS	Senior High School
SME	Small and Medium scale Enterprise
SSMD	Small-Scale Mining Department

SHD	Sustainable Human Development
SSA	sub Sahara Africa
SMC	Supreme Military Council
TNMA	Tarkwa-Nsuaem Municipality Assembly
UMAT	University of Mines and Technology
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNO	United Nations Organisation
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNDESA	United Nations Economic Social Agency
UNIDO	United Nations Industrial Development Organisation
USA	United States of America
WACAM	Wassa Association of Communities Affected by Mining
WBCSD	World Business Council for Sustainable Development
WHO	World Health Organisation
WCED	World Commission on Environment and Development
WSSD	World Summit on Sustainable Development



# CHAPTER ONE

## INTRODUCTION

The introductory chapter indicates the study's background and problem necessitating the research. The specific research questions and objectives are also highlighted in the chapter. The research questions and objectives emanate from the problem statement and hence answers to them addressed the research problem. The relevance of the study is also contained in the chapter.

### 1.1 Background to the Study

Mining is an essential sector in many developing countries, particularly in regions where economic alternatives are critically limited. In countries where majority of the people are poor, the mining sector plays a significant role in poverty reduction. Consequently, many countries in sub Sahara Africa (SSA) and South East Asia, where poverty is high (World Bank, 2002), have opened up to foreign direct investment (FDI) with the objective of harnessing the inherent potentials in mining to address the poverty challenge. Quiroga (2002) has observed that no country, at least in theory is off-limit to FDI in mining. Many mineral rich countries have revamped legislations especially mining codes and introduced competitive tax systems to create enabling environments for FDI in the mining sector.

Increased investments in the mining sector have resulted in both negative and positive effects on communities in which the exploitation takes place. Many researchers have thus argued that any mining activity can be beneficial or a problem depending on the approach to the management of the exploitation and its expected problems. Akabzaa and Darimani (2001) and Akabzaa et al., (2007) observed that large proportions of the fiscal incomes of many developing countries are export-based of which minerals and ores exportation is key. The World Bank (2002), adds that between 25 percent and 30 percent of fiscal revenues of many developing countries are derived directly from the mining sector.

According to Awudi (2002), the sheer size of the revenues from the mining sector poses an unusual challenge to governments, both in terms of responsible management and distribution. The underlying issue concerning the effects of mining has been related to the challenge of promoting sustainable development and specifically ensuring environmental sustainability. In this vein, Todaro and Smith (2011) are of the view that the interaction between poverty and

environmental degradation can lead to a self-perpetuating process in which as a result of ignorance or economic necessity, communities may inadvertently destroy or exhaust the resources on which they depend for survival. Todaro and Smith's argument is especially true when the environmental is seen as a common-pool resource as explained by Hardin in the "Tragedy of the Commons". This has dire consequences on the sustainability of livelihoods of communities. Rising pressures on natural resources in developing countries can have severe consequences for self-sufficiency, income distribution and future growth potential.

Many poor people in the developing countries consider the mining sector as an area of opportunity to reduce or even eradicate poverty. However, due to mismatch of skills and the requirements of the Large Scale Mining (LSM) companies, the poor are constrained from exploiting the potentials in mining to reduce their poverty. The people have consequently resorted to Artisanal and Small scale Mining (ASM) as a means through which they could reduce their poverty levels. ASM activities have had adverse effects on the environment and have even been more destructive than the LSM companies. The sector is largely unregulated with the miners less concerned about the health and environmental ramifications associated with the ASM activities. The is poverty-stricken and is often quoted in national poverty reduction and rural development strategies even though ASM activities have been in existence in the country for long (Styles et al., 2006).

According to the Blacksmith Institute (2011), most artisanal miners are from socially and economically marginalised communities and turn to mining in order to escape extreme poverty, unemployment and landlessness. They work in difficult and often dangerous conditions. The illegal ASM (galamsey) risk persecution from government, work in old or abandoned shafts which are usually risky and are exposed to toxic chemicals. D'Souza (2002) maintains that people resort to ASM as a means of survival due to the fact that their farmlands and other sources of livelihoods are taken over by LSM companies. The concern, however, is the need to ensure sustainability of livelihoods in these mining communities through planning owing to the finite nature of the minerals on which the ASM depend for survival. It is widely believed that the people involved in this mining sector are equally concerned.

The most important implication for planning is sustainability. To this end, the issues of sustainable livelihoods have become paramount. According to Krantz (2001), in analysing and discussing the concept of sustainable livelihoods, attention must be paid to the various factors and processes which either constrain or enhance poor people's ability to make a living in an economically, ecologically and socially sustainable manner. The issues of development interventionism and mediation must be articulated into tangible and substantive benefits to the mine-affected persons through effective implementation of plans to empower communities to be self-sustaining during and after the lifespan of a mine.

Mining whether large scale or artisanal and small-scale is therefore expected to generate results that will sustain livelihoods. This implies that the livelihoods engendered by the exploitation of minerals should outlive the mines and propel the local economies upwards even afterwards. Stakeholders' commitment is imperative if benefits are to be maximised which must be accompanied by proper plan design and evaluation processes. Agenda 21 by the United Nations Commission on Environment and Development (1992) called for all countries to develop National Sustainable Development Strategies (NSDSs) which are intended to translate the ideas and commitments of the Earth Summit into concrete policies and actions. Agenda 21 also recognised that key decisions are needed at all levels of planning and must be made by all stakeholders together (Bass and Dalal-Clayton, 2001).

Underpinned by the need to ensure sustainable development, the mining industry has been under the searchlight of well organised international advocacy groups. There is also heightened sensitivity in the global mining sector to the need for good corporate behaviour, particularly the execution of significant corporate social responsibilities. Financiers, shareholders, boards of companies as well as the general public no longer condone or tolerate irresponsible behaviour by mining companies. The Minerals' Commission and the Environmental Protection Agency (EPA), all in Ghana, are expected to ensure responsible mining as a move towards environmental sustainability. The Ghana Chamber of Mines is also a keen advocate for consensus commitment of all the stakeholders to good corporate social behaviour.

Apparently, considerable efforts have been made by the mining industry to highlight its commitment to both protecting the environment and addressing the needs of the affected communities. Many companies in the gold mining sector have also made attempts to

negotiate with important stakeholders and formalise agreements with local communities and local and national governments to address areas of concern. Large scale gold mining companies including Goldfields Ghana Limited have indicated their commitments by supporting affected communities to address the social and environmental concerns which include but not limited to access to land, environmental pollution, damage to the health of the affected communities, limited employment opportunities for local people, limited livelihood alternatives and increased social vices associated with their operations (Akabzaa and Darimani, 2001; Akabzaa, 2007). Clearly, the searchlight is focussed on the LSM activities that are formalised and appear to be well-regulated. Consequently, the LSM companies have promised better economic conditions in the mine-host communities.

The promises of better economic conditions are however not fulfilled. The communities in which minerals are exploited end up being the least developed areas. The exploration, extraction and processing of mineral resources are widely regarded as environmentally and socially disruptive activities in the country. As a result, a lot of agitations have characterised the operations of LSM companies. Typical examples in Ghana are the various demonstrations and petitions against the operations of Adamus Resources Limited by some youth and concerned citizens of Nkroful, Teleku-Bokazo, Anwia and Salman in the Ellembele district in the Western region of Ghana (Owusu-Koranteng, 2008). As argued earlier, the aggrieved persons also decide to reduce their poverty by engaging in the mining activities often through ASM.

LSM companies are perceived to be environmentally destructive and socially disruptive. However, ASM which by law is the preserve of only Ghanaians appears to be more destructive and pose a lot of environmental problems as well as livelihood challenges to local communities. Unlike the LSM, the operations of the ASM are often unregulated. They are therefore without plans to reclaiming the lands after exhaustion of the minerals (Styles et al, 2006) while the human capital is affected through the unsafe methods of mineral exploitations. There is therefore the need for planning to sustain the livelihoods in the mining communities, hence the need to investigate ways of sustaining livelihoods in mineral rich communities.

## **1.2 Problem Statement**

Many of the mineral dependent states in SSA are threatened by mass and intractable poverty and social deprivation. This is evident in the strong negative correlation between a country's level of mineral dependence and its Human Development Index ranking (Feeney, 2002). Thus, the more the states rely on exporting minerals, the worse their standard of living is likely to be due to the inequality in the distribution of the wealth coupled with the sector's adverse environmental ramifications. The apparent negative correlation between mining and development is explained by the natural resource curse framework. The framework posits that the blessing/windfall of "nature's gifts" tends to be a curse (Obeng-Odoom, 2012). The impact of mining on local communities has therefore been an area of growing concern and attention, and one that mining companies, Non-Governmental Organisation (NGOs) and governments are grappling with. As a result of the concerns expressed by the communities, civil society organisations and other stakeholders, Corporate Social Responsibility (CSR) has become a priority concern in the mining industry. Examples of Corporate Social Responsibility initiatives being carried out by mining companies include the implementation of Local Economic Development (LED) projects, construction of community infrastructure such as community centres, schools and local employment and enhanced alternative livelihoods (Akabzaa, et al, 2007). They are also undertaking stakeholder liaison exercises to prevent confrontations with host communities (Cottrell and Rankin, 2000).

In spite of all these efforts, there are high rates of unemployment and poverty among indigenous people in mining communities. Tensions exist between foreign multinational companies and the local people. The local people feel cheated and attribute their economic and social problems to the operations of mining companies in their communities. In 2006, the National Coalition on Mining in Ghana submitted a factsheet entitled "Call to action, stop the violence in mining communities" to Ghana's Parliament. The report highlighted was in line with the major arguments espoused in the "Resource Curse Framework" and thus articulated that mining activities in the country have resulted in mass eviction and dislocation of whole communities; the destruction of their environment and total disruption of their economic livelihoods.

According to Owusu-Koranteng (2008), surface mining is gradually killing agriculture but the negative effects of the former on the latter are conspicuously missing from the discussions on the rising cost of food prices. He explains that multinational mining companies like

Anglogold Ashanti, Golden Star Resources, Newmont Ghana Gold Limited, Goldfields Ghana Limited and Chirano Gold Mines hold large tracts of agricultural lands as mining concessions. Consequently, major areas of agricultural production are gradually becoming areas of net food deficit as a result of the operations of surface mining companies. Owusu-Koranteng (2008) supports his arguments with several examples of communities in Ghana which have become net-importers of food due to mining. Kojokrom, a farming community which was displaced by the mining operations of the Bogoso Gold Limited now Golden Star Resources has been resettled near Bogoso. Their livelihoods have been affected because of limited land area for farming. Another example in support of Owusu-Koranteng;s (2008) claim is Kenyase and its environs which had been very important areas for food and cocoa production. Some of the inhabitants became beneficiaries of food aid to survive after the four years of losing their lands to Newmont. Damang supplied food to Tarkwa and other major towns in the Wassa West District until the community was resettled by the Abooso Goldfields Limited, now a subsidiary of Goldfields Ghana Limited, between a forest reserve and the company. The inhabitants were thus denied access to land and has compromised their livelihoods.

Mineral deposits are exhaustible, therefore, mining has a life span. Agriculture on the other hand, is an economic activity which has been the main source of livelihood for majority of people in Ghana including the Tarkwa-Nsuaem municipality. The sector employs about 70 percent of the labour force in the Tarkwa- Nsuaem Municipality. According to Tsuma (2010), about 60 percent of the landmass of the Wassa West district (from which the Tarkwa-Nsuaem Municipality was created) is under mining concession, including people's farms and villages, as well as forest reserves. This together with forest reserves constitutes about 90 percent of the total landmass of the district. The implication of this is that only 10 percent of the land is available for other socio-economic activities. This and many more fuels the claim that people in mining communities have suffered a lot of abuses of power, environmental contamination, and destruction of farms or are pushed off their land for inadequate compensation or forced to accept inadequate resettlement packages (Owusu-Koranteng, 2008; Tsuma, 2010; Obeng-Odoom, 2012).

It is increasingly accepted that corporate social responsibility (CSR) is a key requirement for creating a prosperous and ecologically and socially sustainable world especially in mining communities. Many mining companies however, fail to live up to their own definition of

good CSR. Mining operations usually continue to be out of step with accepted international standards such as the World Bank guidelines on pollution and the World Health Organisation's (WHO) Air Quality Guidelines.

This has had direct impact on domestic lives and social networks in the municipality. Consequently, most of the ASM operators hold the view that the large tract of land acquired by Large Scale Mining (LSM) companies is an encroachment on their sources of livelihood and that the only livelihood option left for them is ASM particularly the ecologically unfriendly, unsustainable and illegal galamsey.

ASM is considered to be inadequately regulated, with respect to health, safety standards and environmental rehabilitation requirements. Even though small scale mining is legal and operators are expected to register to meet the legal requirements before commencing their operations, this is not the case in the Tarkwa-Nsuaem municipality to some extent. According to the Municipal Office of the Minerals Commission, ASM takes place extensively in one Urban Council and five Area Councils in the municipality but only 15 of them were licensed as of 2010. It is difficult to know their exact number because most of them are operating illegally. Unlike the LSM companies which are operating legally and can easily be monitored by the EPA and other related state agencies, the ASMs, particularly the galamsey operators cannot be controlled or monitored easily. Their activities have had wider environmental and social consequences posing as threats to livelihoods in the mining communities. Additionally, the ASM do not make any attempts to create alternative livelihoods in the mining communities as required by the Minerals Commission in Ghana (Temeng and Abew, 2009). Currently, a lot of Chinese investors have joined the ASM sector and have introduced various techniques and equipment into this sector of mining. The Chinese contractors are consulted for the capital equipment needed for the mineral exploration owing to the limited capacity of the local ASM to procure their own machinery. Various forms of partnerships have thus emerged and all these have direct implications for sustainable livelihoods in the municipality.

Mining is consequently perceived to be a symbol of poverty and misery in host communities. Mining communities are therefore perceived to experience "poverty in the midst of plenty" (Owusu-Koranteng, 2008; Oyejide and Adewuyi, 2011; Obeng-Odoom, 2012). Ideally, the change in the socio-economic outlook of the people in mining communities should be

sustainable. Future generations should have sustainable livelihoods and should be able to attribute the development of their communities to their mineral endowment. They should not rather encounter livelihood insecurities for the fact that their communities are endowed with mineral resources. This can only be achieved through good planning on the exploitation of mineral resources such as gold. It is for these reasons that the Minerals Commission in Ghana has made it obligatory for all mining companies to assist their host communities in Alternative Livelihood Projects (ALPs). This study was therefore carried out to identify ways of sustaining livelihoods in the mining host communities in the Tarkwa-Nsuaem Municipality.

### **1.3 Research Questions**

Based on the problem statement above, the study sought to find answers to the following questions:

1. What is the nature of livelihoods in mining communities within the Tarkwa-Nsuaem Municipality?
2. What factors inform people's choice of livelihoods in the Tarkwa-Nsuaem Municipality?
3. What is the impact of ASM on livelihoods in the Municipality?
4. What measures could be put in place to ensure the sustainability of livelihoods in the municipality?

### **1.4 Research Objectives**

The main objective of the study is to identify the means to ensuring sustainable livelihoods in mine host communities in the Tarkwa- Nsuaem Municipality. The specific objectives are:

1. To examine the nature of livelihoods in the Tarkwa-Nsuaem Municipality;
2. To identify the factors that inform the choice of livelihoods in the Tarkwa-Nsuaem Municipality;
3. To assess the impact of ASM on livelihoods in the municipality;
4. To assess the measures that could be put in place to ensure the sustainability of livelihoods in the mining communities of the Tarkwa- Nsuaem Municipality.

### **1.5 Justification of the Study**

The study aims to assess the positive and negative effects of ASM activities on the people of the Tarkwa-Nsuaem municipality and how this has distorted or enhanced the livelihoods of

the people. In addition, the study seeks to identify the mechanisms available for mitigating the negativity of mining activities and the role of the public and private actors in this process. Critically, the research seeks to build a relationship between mining and sustainable livelihoods within the context of the Tarkwa-Nsuaem Municipality.

The study provides a critical and analytical perspective to policy makers in understanding whether or not sustainable livelihood as an approach to poverty reduction in mining communities is worthwhile. It also provides a basis and an insight to the state, NGOs and other stakeholders as to the need to critically examine the impact of mining activities particularly ASMs on livelihoods in host communities. It provides the basis to consult the mining communities in planning intervention programmes. The study again helps to view mining communities as beneficiaries of any sustainable livelihood intervention and to recognize the importance of mining communities in serving in any intervention programmes that will be beneficial to them.

Again, since sustainable livelihood is a current development issue that is gradually being embraced in the Ghanaian development arena, the research will serve as one of the fundamental basis for all those who will in one way or the other harbour the desire to conduct any future research into this area of study and will also contribute to knowledge on the subject matter.

### **1.6 Limitations**

It was not easy getting information from the various respondents. Officials from the various institutions and associations were not very willing to divulge information and in some cases they had to seek permission from their headquarters which protracted the survey. The researcher overcame this bottleneck with follow-ups and continued assurance that the information they gave would be treated with the deserving confidentiality. The institutions and agencies eventually provided the required data for the study.

Both legal and illegal small-scale miners were also reluctant to give information and were sometimes very hostile. They were afraid of being captured by the media. Others were simply media and research weary. The illegal small-scale miners (galamsey) were also afraid of being taxed or questioned about the legality of their operations and consequently being arrested. Physical access to some of the ASM sites was difficult and appeared to be

dangerous. The researcher overcame all these limitations with the escort of respectable members of the mining groups and a local gold buying agent who had the trust of the miners after having worked with them for about a decade.

The hostile attitude of unlicensed ASM groups emerged as a limitation; hence only two groups instead of four could be covered. The researcher however triangulated the findings with other research findings to ensure external validity of the research findings.

### **1.7 Organisation of the Study**

The study has been divided into nine chapters. Chapter one which is the introductory chapter covers the background to the study, the problem statement, objectives and research questions as well as the justification for the study. It also covers the limitations and the organisation of the study. With chapter one as the foundation of the research, chapter two provides a framework indicating the definition of key concepts and the linkages among them.

Following the explanation of the relevant concepts in chapter two, the third chapter provides a global and national perspective on ASM. The second and third chapters thus provided the conceptual and theoretical frameworks for the study. Unanswered issues in the literature ought to be answered in the primary data collection and analyses. Chapter four then details the empirical strategy used to collect and analyse data and present the results. The profiles of the Western Region and the Tarkwa-Nsuaem municipality are covered in chapter five. The review of the profile of the study area highlights the environment in which the data were collected.

Chapters six and seven consist of analysis of household data collected from the selected ASM communities. Specifically, chapter six covers the nature of livelihoods in the municipality, while chapter seven covers the factors that influence the choice of livelihoods in the Tarkwa-Nsuaem municipality. ASM operations and their related activities are analysed in chapter eight. Chapter nine focuses on the major findings, recommendations and conclusion.

## **CHAPTER TWO**

### **CONCEPTUAL FRAMEWORK FOR SUSTAINABLE LIVELIHOODS IN ARTISANAL SMALL-SCALE MINING COMMUNITIES**

Chapter one of this study provided the required premise of the study with details of the statement of the problem, research questions and research objectives. With this foundation, this chapter focuses on the concepts that are relevant to the study. It also contains the conceptual framework which provides inputs for the design of the empirical strategy for the study.

#### **2.1 Meaning of Concepts**

This sub-section of the chapter explains concepts such as livelihood, sustainability and sustainable livelihoods which are embodied in the subject under investigation. Analyses of these concepts help in developing an appropriate conceptual framework for the study.

##### **2.1.1 Livelihoods**

The most widely accepted definition of a livelihood system is from the work of Chambers and Conway (1992) which defined the concept to comprise people, their capabilities and their means of living, including food, income and assets. The authors indicate that livelihood has a tripartite relationship where people survive by using their capabilities to make productive uses of their assets, which are both tangible (resources and stores) and intangible (claims and access). Ellis (2000) also defines livelihood as the activities, the assets and the access that jointly determine the living gained by the individual or household. What is common between the two views is the ability of people to undertake activities and own assets to guarantee them decent living conditions.

Wallman (1984) adds an important perspective in explaining the concept of livelihoods. He argues that a livelihood is more than just a matter of finding or making shelter, translating money and preparing food or exchange in the market places. It is equally important and a matter of the ownership and articulation of information. This implies that livelihoods transcend the activities and assets that ensure decent living conditions to include the management of social relationships, the affirmation of personal significance and group identity and the interrelation of each of these tasks to the other. All these put together constitute livelihood. This is what Chambers and Conway (1992) define as capabilities. To

Wallman (1984) therefore, a livelihood is an umbrella concept which suggests that social life is in layers and which overlap (both in the way people talk about them and the way they should be analysed). This is an important analytical feature of livelihood.

A juxtaposition of the attempts made at conceptualising livelihood reveals three mutually reinforcing but not exclusive components, namely; assets, activities and entitlements.

- Assets that communities have which include natural resources like minerals, land and water; social assets like community and family networks; political assets such as empowerment and rights of access; and human assets like education, knowledge and skills;
- Activities, which refer to what the people in a community, use their assets for to earn a living. The activities may include selling goods and services; and
- Entitlements, like those which are linked to legal or customary rights. An example is access to property that is commonly owned.

#### *Determinants of Livelihoods*

Many livelihoods are predetermined by where one is born, gender or through socialisation. It could also be improvised or acquired by choice. Livelihoods which are predetermined by accident of birth may be ascriptive. For instance, being born into a caste or a particular ethnic group where specific roles are assigned. A person may also be born, socialised and apprenticed into an inherited livelihood for example as a carpenter, farmer or cooked food vendor. Some people also improvise livelihood with degrees of desperation with what they do being largely determined by the social, economic and ecological environment in which they find themselves. Through education and or migration, an individual or a household may choose a livelihood. Those who are wealthy in society usually have a wider choice than those who are poor, and a wider choice is usually generated by economic growth (Chambers and Conway, 1992). A livelihood is considered environmentally and socially sustainable if it maintains or improves the local and global assets and is able to recover from stress and shocks and the assets are able to provide for future generations. In the mining industry the term sustainable livelihoods is often associated with interventions that mitigate the impact of mining activities on communities (DeJong, 2012).

Conceptually, 'livelihoods' denote the means, activities, entitlements, and assets by which people make a living. Assets are defined as: natural/biological (land, water, common-property resources, flora, fauna), social (community, family, social networks), political (participation, empowerment – sometimes included in the 'social' category); human (education, labour, health, nutrition); physical (roads, clinics, markets, schools, bridges); and economic (jobs, savings, credit) (Krantz, 2001). One common thing that these definitions and explanations have is the fact that livelihoods deal with people, their resources and what they do with these resources. Livelihoods essentially revolve around resources (for example; land, minerals, crop, labour, food, money and social relations). However, these resources are closely linked to the issues and problems of access and changing political, economic, socio-cultural circumstances.

Livelihoods are also about creating and embracing new opportunities. While in gaining a livelihood or attempting to do so, people may at the same time have to cope with risks and uncertainties such as erratic rainfall, diminishing resources, pressures on the land, changing life cycles and kinship networks, epidemics such as HIV and AIDS, increasing food prices, inflation and international competitions. These trigger the fears of sustainability which is explored in the subsequent sub-section.

### 2.1.2 Sustainability

The term sustainability reflects the need for careful balance between economic growth and environmental preservation (Todaro and Smith, 2011). Sustainability refers to the need for development to be integrated and made socially, economically and environmentally sound and lasting (CISDL, 2005). With the steady increase in global population with its attendant problems such as increasing unemployment and environmental degradation, sustainability of both livelihoods and the environment is of concern. According to Keiner (2004), at the end of the last millennium, the term sustainability became an overall guiding principle for human development. Its success stems from the underlying reflections on existential problems of mankind perceived at that time such as increasing concern for over-exploitation of natural resources and economic development at the expense of environmental quality. To some people, it describes the extent to which projects can lead to continuous growth and expansion in the economy accompanied by effective resource utilisation and employment generation (Aradom, 2005). Sustainability can be a helpful concept because it posits the long-term planning goal of social-environmental system in balance. It is a unifying concept which is

enormously appealing to the imagination that brings together many different environmental concerns under one overarching value. It defines a set of social priorities and articulates how society values the economy, the environment and equity (Paehlke, 1994 cited in Campbell, 2003).

### *Types of Sustainability*

There are four main types of sustainability. These are human, social, economic and environmental. Human sustainability means maintaining human capital. Human capital here constitutes the health, education, skills, knowledge, leadership and access to services. Social sustainability means maintaining social capital (Šlaus and Jacobs, 2011). Social capital is investments and services that create the basic framework for society. It involves systematic community participation and strong civil society, including government involvement. Cohesion of community for mutual benefit, connectedness between groups of people, reciprocity, tolerance, commonly shared rules, laws, and information are factors that promote social sustainability.

The widely accepted definition of economic sustainability is maintenance of capital, or keeping capital intact. It means consuming value-added (interest), rather than capital. Investments in education, health, and nutrition of individuals have become accepted as part of economic development which was originally seen as part of improving human sustainability (Goodland, 2002). Environmental sustainability on the other hand is using natural resources in ways that are efficient and responsible so that both the present and future generations can benefit from it. All these types of sustainability altogether work to achieve sustainable development, because they are interrelated and one cannot effectively work without the others.

Sustainability depends upon various interrelated factors. Five sustainability factors that are common in development literature and the policies of international aid organisations are identified as socio-cultural respect, community participation, political cohesion, economic sustainability and environmental sustainability (McConville and Mihelcic, 2007). From the above, the term sustainability refers to a careful balance between economic, social and spatial development in a manner that equally guarantees the needs of both the current and future generations.

### 2.1.3. Sustainable Livelihoods

Sustainable livelihood is a development concept that has been in existence for a long time. It is widely thought to have originated from the United Nations systems, particularly the United Nations Conference on Environment and Development (UNCED)<sup>1</sup>. Sustainable livelihoods can be seen as a goal that communities wish to attain. The concept covers socio-economic factors such as employment, education, access to infrastructure services, healthcare and investment. It is therefore a development approach where communities are at the centre of all the processes, and are making the decisions that affect how they sustain themselves. Sustainable livelihood approaches support interventions that lead to sustainable development (DFID, 1999).

The sustainable livelihoods idea was first introduced by the Brundtland Commission on Environment and Development as a way of linking socioeconomic and ecological considerations in a cohesive and policy-relevant structure (Krantz, 2001; Chandima, 2010). This approach of conceptualising the concept focussed directly on the sustainable reduction of poverty through equity in the distribution of social and economic gains with environmental sustainability at the heart of all these. In this vein, the 1992 United Nations Conference on Environment and Development expanded the concept, especially in the context of Agenda 21, and advocated for the achievement of sustainable livelihoods as a broad goal for poverty eradication (UN, 1992).

The expansion of the concept of sustainable livelihood by the 1992 United Nations Conference on Environment and Development is an attempt to go beyond the conventional definitions and approaches to poverty eradication. These had been found to be too narrow because they focused only on certain aspects or manifestations of poverty, such as low income, but did not consider other vital aspects such as vulnerability, social exclusion and environmental degradation. The new paradigm is that attention is paid to the various factors and processes which affect poor people's ability to make a living in an economically, ecologically, and socially sustainable manner. After years of limited success in eliminating poverty, new ideas about development have emerged and sustainable livelihood approaches represent one of such ideas. The sustainable livelihood concept offers the prospects of a more coherent and integrated approach to poverty reduction (Krantz, 2001). To Ashley and Carney

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<sup>1</sup> Also known as the Brundtland Commission. The two names are used interchangeably in the text.

(1999), sustainable livelihood is a way of linking together the objectives, scope and priorities of development in order to enhance lasting progress in poverty elimination. The study interprets the word “development” in the Ashley and Carney’s comprehension of sustainable livelihood to encompass social, economic and spatial (environmental) development. This explanation is an acknowledgement of the Brundtland Commission’s explanation of the concept of sustainable development which is an intersection of economic, social and environmental factors.

Following from the above, Moser and Dani (2008) observe that sustainable livelihood framework shares common backgrounds rooted in the poverty alleviation/reduction debates of the 1990s. Similarly, to Chambers and Conway (1992) the objective of sustainable livelihoods for all provides a focus for anticipating the 21st century and points to priorities for policy and research. A triangulation of the two views indicates the sustainable livelihood approach is vital for sustainable poverty reduction by safeguarding people from relapsing into the previous poor situations. These apply not only to the current generation but also the unborn generation. Relating the concept of sustainability to livelihood, sustainable livelihood then refers to measures aimed at safeguarding the use of means, activities, entitlements, and assets by which people make a living.

## **2.2 Sustainable Livelihood Frameworks**

Despite the attempts that have been made to conceptualise the concept of sustainable development in the literature, Benson et al (2007) observe that the concept is still evolving as an idea and a methodology. However, several international development agencies such as the United Nations Development Programme (UNDP), the Department for International Development (DFID), CARE International and OXFAM have adopted it in project appraisals and reviews and it is steadily becoming part of the mainstream of development planning.

### **2.2.1 United Nations Development Programme’s (UNDP) Sustainable Livelihood Framework**

The promotion of sustainable livelihoods is part of UNDP’s overall Sustainable Human Development (SHD) mandate, adopted in 1995. The mandate includes: poverty eradication, employment and sustainable livelihoods, gender protection and regeneration of the environment, and governance. The Sustainable Livelihood Approach is one way of achieving poverty reduction, though there are also other strategies being pursued within the organisation (for example; macroeconomic growth, community development and

community-based natural resource management). As one of UNDP's corporate mandates, sustainable livelihoods offer both a conceptual and a programming framework for poverty reduction in a sustainable manner (Krantz, 2001).

The sustainability of livelihoods becomes a function of how men and women use asset portfolios on both a short- and long-term basis. The UNDP employs an asset-based approach, emphasising the promotion of people's access to and sustainable use of the assets upon which they rely as central to poverty reduction. To this end, it stresses the need to understand the coping and adaptive strategies pursued by men and women. Coping strategies are short-term responses to a specific shock such as drought, while adaptive strategies entail long-term change in behaviour patterns as a result of a shock or stress. Both are influenced by people's asset status but also have implications for the composition of the assets themselves, which could be depleted or regenerated. Moreover, UNDP specifically focuses on the importance of technological improvements as a means to help people rise out of poverty. Other key emphases of the UNDP Sustainable Livelihood Approach are that:

- the focus should be on people's strengths, as opposed to needs;
- policy (macro-micro links) and governance issues as they impinge on people's livelihoods should be taken into consideration and addressed through specific actions; and
- sustainability is constantly assessed and supported.

UNDP usually works at the national level and runs specific programmes and activities at district and village levels. Ideally, the Sustainable Livelihood Approach is first introduced in discussions with government counterparts at the national level through, for example, the Advisory Note and the Country Co-operation Framework, and is subsequently applied as a distinct approach in the programming cycle (often resulting in specific 'Sustainable Livelihood programmes'). To facilitate this process, UNDP has developed a procedure for the design, implementation, and evaluation of sustainable livelihood programmes consisting of five steps:

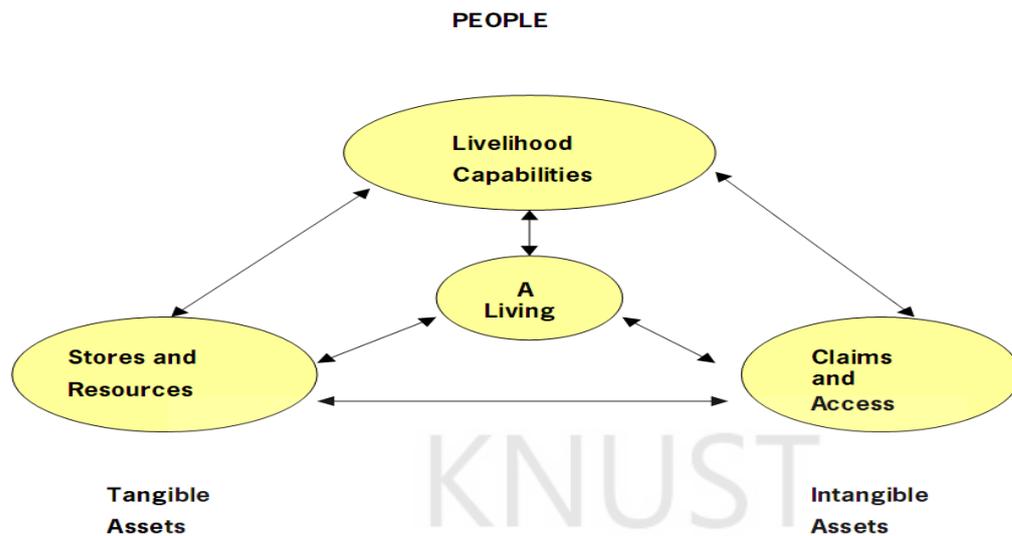
- A participatory assessment is carried out of the risks, assets, and indigenous knowledge base found in a particular community as reflected in the coping and adaptive strategies pursued by men and women;

- An analysis of the micro, macro, and sectoral policies that influence people's livelihood strategies;
- An assessment and determination of the potential contributions of modern science and technology that complement indigenous knowledge systems in order to improve livelihoods such as the use of improved seeds or seedlings or silos;
- An identification of the social and economic investment mechanisms (i.e., microfinance, expenditures on health and education) that help or hinder existing livelihood strategies; and
- An assurance that the first four stages are integrated in real time, so that this process is part of overall programme of development, rather than a series of isolated events.

For each of the steps above, different methodological tools and guidelines have been developed. These include a manual for Participatory Assessment and Planning for Sustainable Livelihood (PAPSL), a programme support document template for Sustainable Livelihood to be used by UNDP country offices in their programming efforts. Discussion papers on policy analysis and formulation for sustainable livelihood as well as on how indicators of Sustainable Livelihood can be developed and a note on how gender aspects can be integrated into the five steps (Krantz, 2001).

As indicated in Figure 2.2, the UNDP's approach to the promotion of livelihoods looks at the linkages that exist between livelihood capabilities, tangible and intangible assets that influence a living.

**Figure 2.2. UNDP's Approach to Promoting Sustainable Livelihoods**



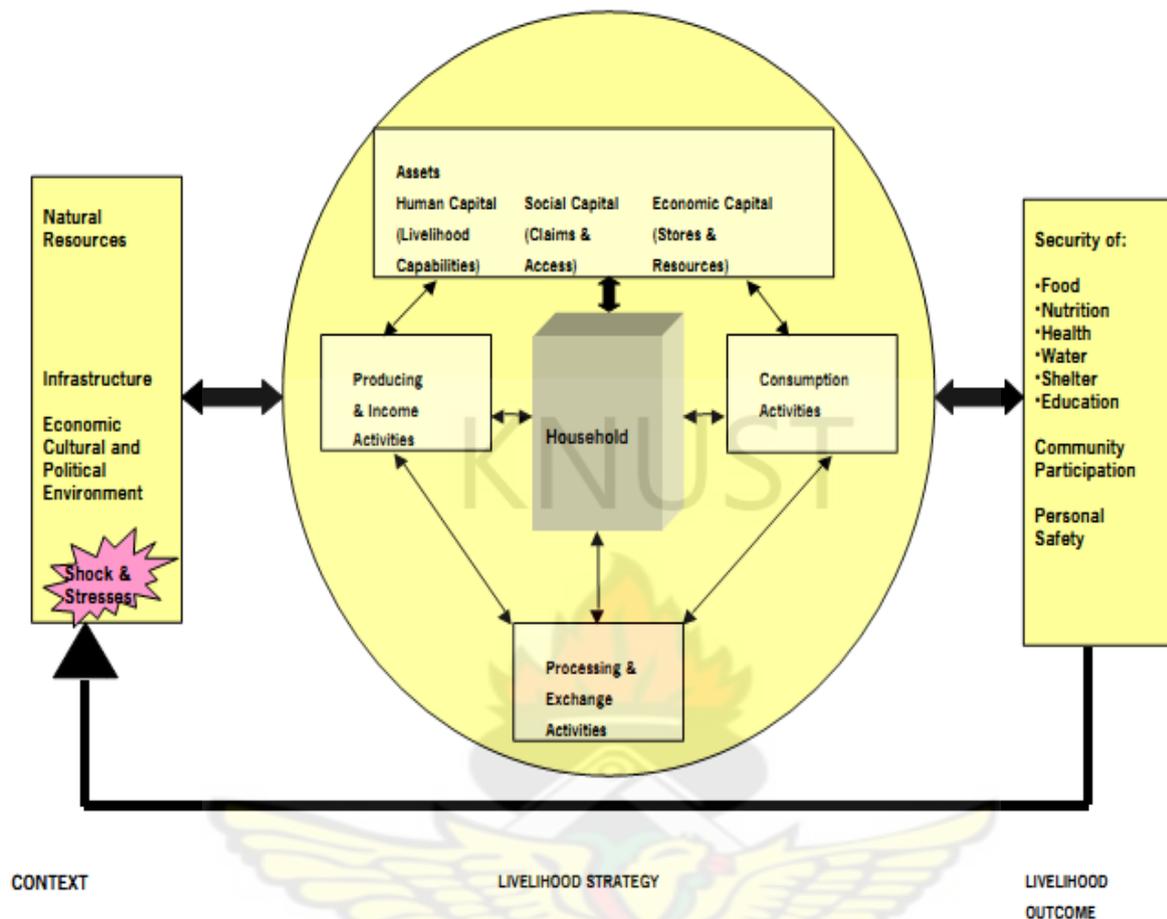
Source: UNDP, 1997 cited in Krantz, 2001; 14

### 2.2.2 CARE International's Sustainable Livelihood Framework

CARE's organizational mandate as an international NGO is to focus its programmes on helping the poorest and most vulnerable, either through regular development programmes or through relief work. Since 1994, CARE has used what it refers to as Household Livelihood Security (HLS) as a framework for programme analysis, design, monitoring, and evaluation (Krantz, 2001).

CARE's definition of household livelihood security emphasizes a capacity-building approach to development, and even relief activities, treating people more as active beings in constructing their own livelihoods than as passive recipients of external help.

**Figure 2.3. CARE's Livelihood Model**



Source: CARE International, 1994 cited in Krantz, 2001; 16

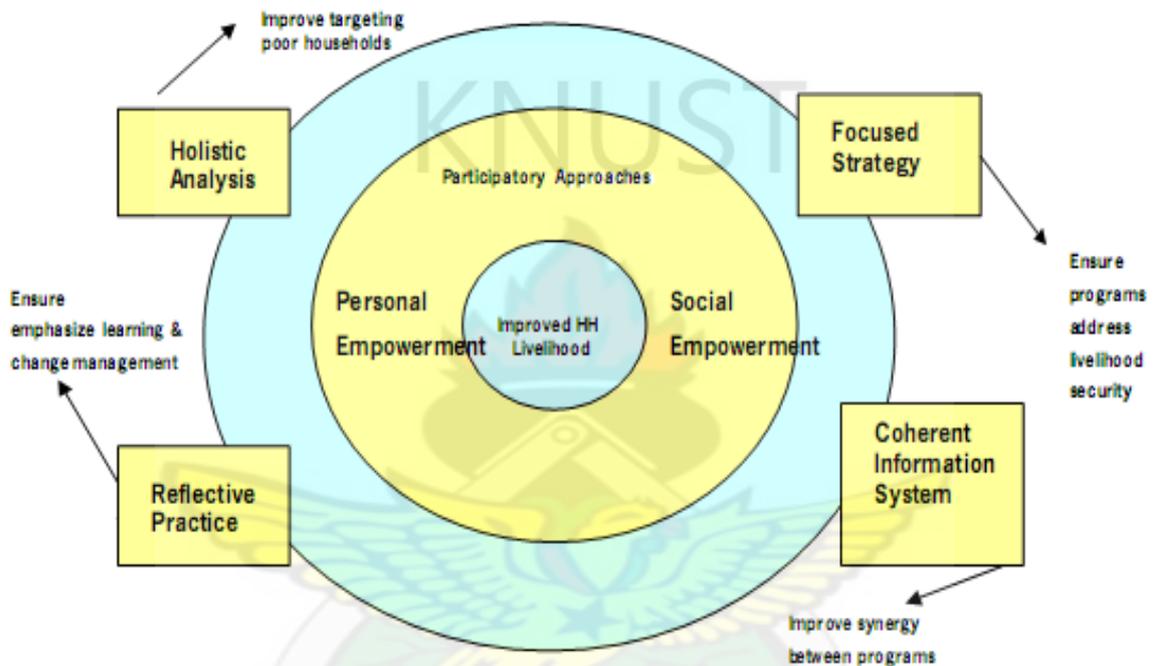
CARE seeks to operationalise its livelihood approach through a dynamic and interactive programming process which includes the following steps:

- identify potential geographic areas using secondary data to find where poverty is concentrated;
- identify vulnerable groups and the livelihood constraints that they face;
- collect analytical data (guided by CARE's overall livelihood model), taking note of trends over time and identifying the indicators that will be monitored; and
- select the set of communities for programme interventions (Ashley and Carney, 1999).

Over the past few years, Rapid and Participatory Livelihood Security Assessments (RLSA or PLA) has become a major tool for the collection and analysis of information at the community level. The main purpose of these participatory assessments is to understand the

nature of livelihood strategies of different categories of households (social differentiation), their levels of livelihood security, and the principal constraints and opportunities to address through programming. This information is also disaggregated by gender and generation (Frankenberger et al., 1999). Based on the above, CARE has come up with programming principles for livelihoods frame work as shown in Figure 2.4.

**Figure 2.4. CARE’s Programming Principles for Livelihood Projects**



Source: CARE International, 1994 cited in Krantz, 2001; 17

### 2.2.3 The Department for International Development’s Framework

The adoption of a livelihood approach within DFID resulted from the publication of the 1997 United Kingdom Government White Paper on International Development, where it was affirmed that the overriding aim of DFID is the elimination of poverty in poorer countries. One of the three specific objectives designed to achieve this aim is a commitment to ‘policies and actions which promote sustainable livelihoods’ (Ashley and Carney, 1999).

DFID’s definition of sustainable livelihood follows the one developed by the Institute for Development Studies (IDS) and which in turn is a modified version of the original definition elaborated by Chambers and Conway (1992). The objective of DFID’s Sustainable Livelihood Approach is to increase the agency’s effectiveness in poverty reduction by

seeking to mainstream a set of core principles and a holistic perspective in the programming of support activities to ensure that these correspond to issues or areas of direct relevance for improving poor people's livelihoods. The core principles underpinning the approach are listed in Box 1. These can be applied to any type of development activity and are meant to permeate all of DFID's work.

### **Box 1: DFID's Core Sustainable Livelihood Principles**

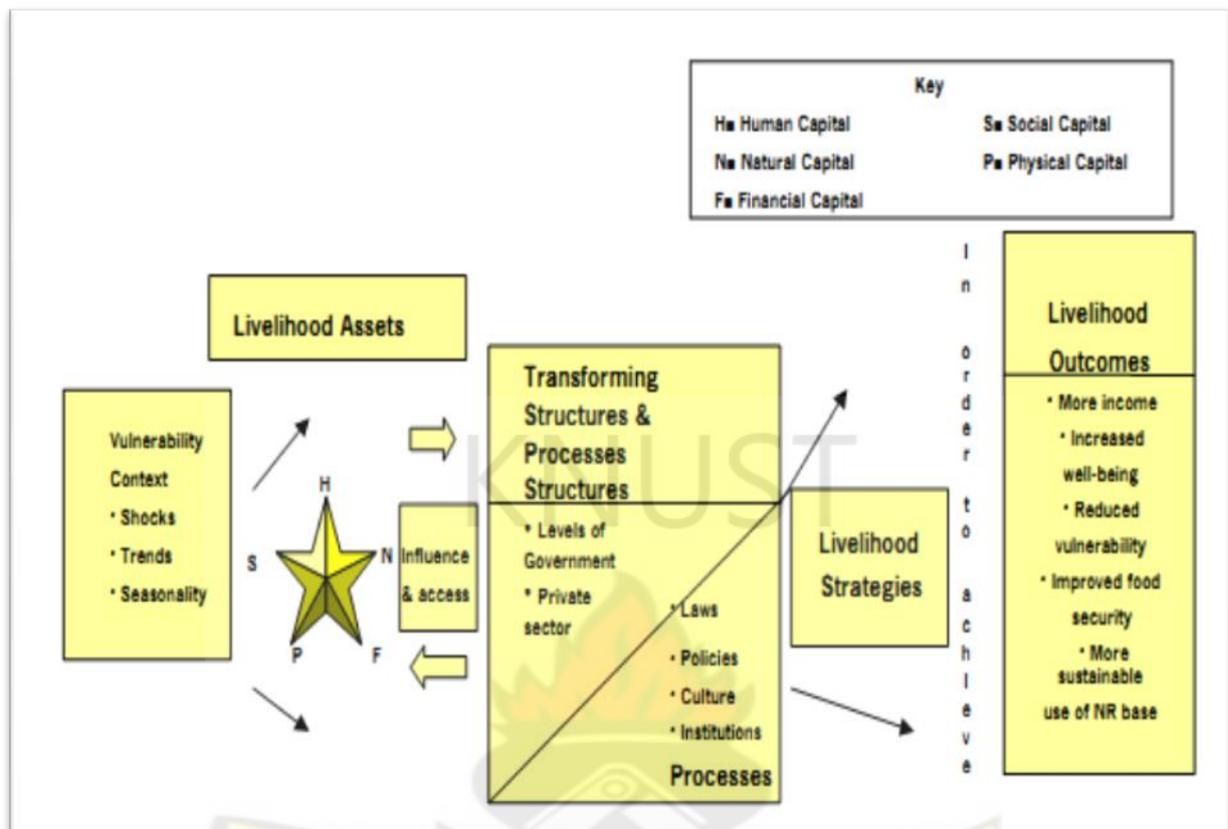
Poverty-focused development activity should be:

- **People-centred:** sustainable poverty elimination will be achieved only if external support focuses on what matters to people, understands the difference between groups of people, and works with them in a way that is congruent with their current livelihood strategies, social environment, and ability to adapt.
- **Responsive and Participatory:** poor people themselves must be key actors in identifying and addressing livelihood priorities. Outsiders need processes that enable them to listen and respond to the poor.
- **Multi-level:** poverty elimination is an enormous challenge that will only be overcome by working at multiple levels, ensuring that micro-level activity informs the development of policy and an effective enabling environment, and that macro-level structures and processes support people to build upon their own strengths.
- **Conducted in Partnership:** with both the public and the private sector.
- **Sustainable:** there are four key dimensions to sustainability – economic, institutional, social and environmental sustainability. All are important – a balance must be found between them.
- **Dynamic:** external support must recognize the dynamic nature of livelihood strategies, respond flexibly to changes in people's situation, and develop longer term commitments.

Sustainable Livelihood Approach must be underpinned by a commitment to poverty eradication. Although they can, in theory, be applied to work with any stakeholder group, an implicit principle for DFID is that activities should be designed to maximize livelihood benefits for the poor.

Source: Ashley and Carney (1999)

**Figure 2.5. DFID's Sustainable Livelihood Framework**



Source: DFID, 1999 cited in Krantz, 2001; 19.

The sustainable livelihood framework is built around five principal categories of livelihood assets, graphically depicted as a pentagon to underline their interconnections and the fact that livelihoods depend on a combination of assets of various kinds and not just from one category. An important part of the analysis is thus to find out people's access to different types of assets (physical, human, financial, natural, and social) and their ability to put these to productive use. The framework offers a way of assessing how organisations, policies, institutions, cultural norms shape livelihoods, both by determining who gains access to which type of asset, and defining what range of livelihood strategies are open and attractive to people (Carney, 1998).

The value of using a framework like this, according to DFID, is that it '...encourages users to take a broad and systematic view of the factors that cause poverty — whether these are shocks and adverse trends, poorly functioning institutions and policies, or a basic lack of assets — and to investigate the relations between them. It does not take a sectoral view of poverty, but tries to reconcile the contribution made by all the sectors to building up the

stocks of assets upon which people draw to sustain their livelihoods. The aim is to do away with pre-conceptions about what exactly people seek and how they are most likely to achieve their goals, and to develop an accurate and dynamic picture of how different groups of people operate within their environment' (Majale, 2002:4).

The sustainable livelihood frameworks have been used in different ways to enhance and focus the priorities of the poor particularly those in the rural areas. According to Ashley and Carney (1999), sustainable livelihood approaches offer a practical way of bringing together existing concepts and lessons with newer ideas about the nature of poverty and how best this condition at the large scale required for the achievement of international development targets. They must however be underpinned by a commitment to prioritising the needs of the poor if they are to make a significant contribution to poverty reduction. While many users are of the view that sustainable livelihood approaches represent a useful contribution to their work, a way of reinforcing best practice and focusing on core development issues, others are of the view that sustainable livelihood approaches are threatening. To Ashley and Carney (1999), this is probably because sustainable livelihood approaches are evolutionary and not revolutionary.

From the various sustainable livelihood frameworks reviewed above, it can be said that sustainable livelihood approaches are aimed at identifying, designing and assessing projects and programmes which focus on reducing or eliminating poverty and enhancing development of the individual and that of the society in which he or she lives. It helps to draw on a wider range of skills to address the issue of poverty. Emphasis is placed on livelihood capabilities and assets in the form of human, social and economic capital. There is a complex relationship among the various components of livelihood which brings out the nexus between sustainable livelihood and poverty reduction. In order for livelihood to be sustainable, the process should be people-centred and participatory especially for the poor and should embrace the four dimensions of sustainability identified as economic, institutional, social and environmental. This will in turn promote sustainable development which is explained in the subsequent subsection.

### **2.3 Sustainable Development**

The term development over the years has evolved from a myopic perspective to a broad concept that builds on the dynamism and manifestation of human lives and activities. There is

a considerable body of literature that charts the history of development from the establishment of the Bretton Wood Institutions through Growth and Modernisation Theory, Dependency and World Systems Theories to Neo-Liberalism and Alternative Development Approaches. The definition of the concept has shifted from economic to other conditions in recent times such as; increasing national self-determination predicated on the notion that development is something a country does for itself and reducing external dependency. Feminist theories of development, democratisation, good governance and respect for human rights have also become more prominent as features of political development contained by the generic sense of development. More fashionable now are notions of environmentally sustainable development (McLean and McMillan, 2003).

The World Commission on Environment and Development (WCED), otherwise known as the Brundtland Commission defines Sustainable Development as "economic and social development that meets the needs of the current generation without undermining the ability of future generations to meet their own needs". Sustainability can be seen to refer to the need for development to be integrated, socially, economically and environmentally, and oriented to the long-term, and hence, able to last (CISDL, 2005). It also describes the extent to which projects can lead to continuous growth and expansion in the economy accompanied by effective resource utilisation and employment generation (Aradom, 2005).

To Burian (2006), sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations. "Sustainability" is the capacity to maintain a desired level of output or service for an extended period. It is the ultimate test of development efforts. It requires not only that a particular project achieves its objectives during the project life but also that the benefits it generates continue beyond the time of the provider's involvement and continue despite technological changes.

From the above, sustainable development is explained as a process that meets the social, political and economic needs of society in a way that the needs of the future generation will not be compromised upon. The measurement of the sustainability of an intervention transcends its life implying that the intervention should continue to yield gains even after its

life. The evolution of sustainable development as a policy concept over the years is therefore explored in the next sub-section.

### 2.3.1 Evolution of Sustainable Development as a Policy Concept

The concept of sustainable development even though used extensively since the mid 1980's, is not a new idea. The concept, contrary to popular perception, did not start with the publication of the report by WCED. In the mid 1980's, well before the publication of the report, the concept of sustainable development had been popularized initially through the work of the United Nations Environment Programme (UNEP) and later on by the activities of the World Bank (Figures et al, 2003). Even though many of the concepts of sustainable development existed before the WCED'S report was published, appearing in 1987, its report started the process of making sustainable development an important issue on the world stage.

The Commission presented and defined the phrase, sustainable development (WCED, 1987) as "development that requires meeting the major needs of and extending it to all the opportunity to satisfy their aspirations for a better life." However, "living standards that go beyond the basic minimum are sustainable only if consumption standards everywhere have regard for long-term sustainability" (WCED, 1987). Thus, sustainable development, as a concept, has two primary pillars; economic development and the consumptive use of the world's natural resources in ways that are sustainable. Thus we have to consume, with the realization that resources are finite, and part of our job as human beings is to preserve the human future on this planet into a limitless future (Davis, 2000). The relevance of sustainable development can therefore not be underestimated. The subsequent sub-section therefore explores the relevance of sustainable development.

### 2.3.2 Relevance of Sustainable Development

The Agenda 21 - Principle 1, of the 1992 Earth Summit, states that "Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature". Thus, it is important to ensure nature is sustained to meet the needs of people. Sustainability is important in order to guarantee equity between current populations and future generations. Sustainable development also improves the well being of beneficiaries by providing facilities which can be maintained. This helps eliminate the problem of reverting to unhealthy sources, especially in the case of water and sanitation.

Sustainable development can however not be fully attained without ensuring sustainability. The two concepts or issues go together. Since sustainable development has at its centre the 'meeting of the needs of the current generation without undermining the ability of future generations to meet their own needs', there is also the need to ensure sustainability of facilities to make sure that they provide their intended benefits to serve current needs and even kept well to serve future needs as well. Efforts aimed at ensuring sustainable development in Ghana is therefore discussed in the subsequent subsection.

### 2.3.3 Sustainable Development in Ghana

Emerging efforts to institutionalize the process of National Sustainable Development Strategies (NSDS) as a development management mechanism have been driven by developments in the international arena, including the Brundtland Report, Agenda 21, and the World Summit on Sustainable Development (WSSD). The emphasis of the NSDS is on seeking a balance between economic progress, social development and environmental management and other dimensions for sustainable development (Organisation for Economic Co-operation and Development, 2006). Ghana has been engaged in several strategy policy processes in efforts to achieve poverty reduction and sustainable development as a result of the emphasis placed on sustainable development by the Brundtland Report of 1987.

Ghana's pursuit of sustainable development has been shaped or informed by its decentralization policy. This is a shift in the approach to development programming towards increasing community or local participation. Since the inception of the current system of local government based on the policy of decentralization in 1988, the process has involved a re-definition of the relative roles and structures of government at the national, regional and local levels by allocating policy making to the centre, coordination to the regional level, and implementation to the local level. Decentralization has covered several reforms centring on political, fiscal and administrative decentralization coupled with decentralized development planning and management of public-private partnerships (Vordzorgbe, 2005). Decentralization promotes participation at the grassroots level. It gives people the opportunity to take part in decisions that affect their lives. This enables them to take control of affairs and manage them in ways which ensure sustainable development.

The thematic focus of sustainable development strategy processes/frameworks proposes eight principles of sustainable development that illustrate the broad thematic areas of focus or

objectives of strategies for sustainable development applicable to Ghana. These grand objectives represent a set of human and societal values that NSDS should aspire to. Progress towards achieving the objectives will ensure movement towards sustainability of development efforts in Ghana. The proposed key principles and broad objectives of sustainable development of Ghana are; nurturing a conducive enabling milieu, meeting basic needs and developing a better quality of life for present and future generations. Managing natural resources sustainably, promoting safe development within a caring society, targeting effective participation of stakeholders and basing development on science and technology as well as pursuing internationally responsive development (Vordzorgbe, 2005). These proposed principles will holistically promote social, economic and environmental developments which constitute sustainable development.

#### **2.4. Community**

The word "community" is derived from the Old French word *communité* which is also derived from the Latin *communitas* (*cum*, "with/together" + *munus*, "gift"), which is a broad term for fellowship or organised society (Hillery, 1955). A "community can be defined as any sizeable grouping of human beings who enter into a sustained relationship with each other for the purpose of improving themselves and the world within which they live" (Bopp and Bopp, 2001;13 cited in Bopp and Bopp, 2004). From this definition, it can be said that communities are not homogenous. There are sub groupings within each community. A community is a relational universe, nested within even larger systems that influence it. Each community has its living web of relationships, processes, conditions and needs. A community is also a shared sentiment or feeling. As a sentiment, a community points to the quality or character of human relationships.

Community is a word that is used frequently, but its meaning turns out to be elusive. How the concept of community is conceived depends on context. The most helpful way to approach community, is not to recognise it as a single concept, but as a collection of related concepts revolving around unity, connectedness and sharing within groups of human beings (Coleman, 1987). The concept of community is inherently political because it contains the built-in assumption that people have a natural capacity to act publicly, together, for common purposes. Community connotes issues such as; collective self-governance, as well as related issues concerning setting goals, distributing privileges and powers, enforcing rules, handling conflict and reaching agreement within groups of individuals who hold something significant

in common. Policy makers and development practitioners are usually accused by community members of limited or lack of understanding of the rich and deep understanding of the community “story”. They are usually unable to understand what the measurements they take actually mean, particularly related to the central problem of all professional development intervention on how to help the community transform its conditions and processes so that sustainable prosperity and well-being is the outcome.

In biological terms, a community is a group of interacting organisms (or different species) sharing an environment. In human communities, intent, belief, resources, preferences, needs, risks, and a number of other conditions may be present and common, affecting the identity of the participants and their degree of cohesiveness. In sociology, the concept of community has led to significant debate, and sociologists are yet to reach agreement on a definition of the term. There were 94 discrete definitions of the term by the mid-1950s (Hillery, 1995). Traditionally a "community" has been defined as a group of interacting people living in a common location. The word is often used to refer to a group that is organized around common values and is attributed with social cohesion within a shared geographical location, generally in social units larger than a household. The word can also refer to the national community or global community or what is commonly referred to as international community.

Since the advent of the internet, the concept of community no longer has geographical limitations, as people can now virtually gather in an online community and share common interests regardless of physical location. Communities are nested; one community can contain another—for example a geographic community may contain a number of ethnic communities (Tropman et. al, 2006).

#### 2.4.1 Community Capacity

Community capacity refers to what community insiders need to; have, know, do, and be, in order to effectively influence the basic issues that affect them. Domains of community capacity such as participation, vision, community cohesion and resilience as listed in Table 2.1 are reified theoretical constructs with no more than a vague academic relevance to any particular community and its challenges until the community generates its own capacity domains, rooted in its own analysis (which may indeed be supplemented by the knowledge and experience of outside helpers).

**Table 2.1. Fundamental Community Capacities for Managing Change**

Community Capacities	Details of Identified Capacities
Participation	The community's capacity to engage its own diverse membership in constructive processes of consultation, collective analysis and decision making.
Vision	The capacity to systematically develop, articulate and adapt a picture of sustainable health, well-being and prosperity toward which the community can work.
Community Cohesion	The capacity to work together, to develop common aims purposes and methods; to manage and transcend conflicts and differences; and to incorporate diversity and complexity into evolving community systems.
Resilience	The capacity to absorb shocks while maintaining function (Berkes and Folke, 2002 in Gunderson and Helling, 2002). The opposite of resilience is vulnerability. The adaptive capacity is critical in complex sociological systems. Resilience moves beyond trying to control systems assumed to be stable to managing the capacity of human beings in relationship with natural systems to absorb shock and surprise and to respond with creativity, novelty and innovation (Folke et al, 2002; 4)
Ongoing Learning	The capacity to learn from development process while they are underway, and while participating in them (Schön, 1983; Bopp et al, 2000). The capacity to reflect on what worked and what did not.
Leadership	The capacity to engage the diversity of sectors and levels within community life in process of learning and action for health.
Partnership Building	The capacity to create and maintain strategic alliances with relevant individuals, organisations and departments of government that can in some way support and enhance the ongoing development work at the community level.
Assessing and managing resources	Management is the capacity to organise people and resources so that their full potential is effectively utilised. The ability to identify and access resources that already exist within the community (knowledge, skills, human energy, natural capital, social capital, money, etc.) is critical and often overlooked (Kretzmann and McKnight, 1994). It is also important to learn to utilise existing resources in novel and creative ways in response to surprising and shifting circumstances. Sometimes however, it is critical to be able to locate, access, and wisely manage resources (money, technical assistance, allies etc) that originate outside the community.

Source: Bopp and Bopp, 2002

In most communities, until such a process is undertaken, what is known about present community realities, past circumstances that shaped them, and future hopes and possibilities

is known in scattered bits and pieces by many different individuals and groups. The process of developing a collective “story” is really like fitting the pieces of a complex jigsaw puzzle together, and seeing the whole picture it makes for the first time (Bopp and Bopp, 2001).

The introduction of community capacity assessment is likely to be strategically effective as an approach to enhancing sustainable community development process. However, this will be possible only when community members understand the linkages between their own capacities (or the lack thereof) and their ability to foster the changes they want in terms of development outcomes. It is difficult to justify the cost, in community time and energy, of carrying out a systematic community capacity assessment unless community capacity will be directly enhanced in and through the process of measuring it.

#### 2.4.2 Types of Communities

Communities could be categorised as; place-based, identity-based and interest-based

##### Place-Based Community

Place-based community is “a general term for a real territorial settlement” (Gusfield, 1975; 32). Here, community refers to geographical, usually local, places with identifiable boundaries such as city limits. When local places coincide with official political jurisdictions, community becomes little more than a synonym for municipality. Traditionally, community is associated with villages and towns, but the concept “has been generalised to the wider scope of urban communities” (Gusfield, 1975; 33). As a result, there are inner-city neighbourhoods, mobile home parks, and gated housing complexes (also known as gated communities), as well as Native reserves and suburbs, called communities.

What people hold in common in these communities is shared space. This may create shared interests and feelings of closeness that did not previously exist, and it frequently results from identifiable, retirees, upper middle-class professionals, migrants concentrating themselves in a particular location. Community does not necessarily go any deeper than geographic proximity, however, and it may not even exist in the eyes of all community “members”. Laws or groups’ rules set out conditions for belonging to place-based communities, such as property ownership (for membership in condominium associations), citizenship (for voting), an address (for attending schools), or payment of dues (for using the facilities of community leagues). In a very important sense, this form of community emphasizes the perceived

“grassroots” or democratic character of local places, as opposed to the more distant elitist “higher” levels of government. Local places are seen as communities because it is believed that they support closeness among people. Locality facilitates people’s awareness of and participation in the decisions that affect their immediate, everyday lives in common.

### Identity-Based Community

Groups whose members share at least one identifiable characteristic constitute another significant form of community. Characteristics including national origin, language, religion, sex, sexual orientation, skin colour, or degree of physical ability may underlie people’s personal and, thus, collective identity. While these identities frequently produce political interests and claims, the basis of community is the shared identity, which precedes and goes beyond political concerns.

Identity-based community can facilitate a group’s self-awareness, appreciation of its culture and history and organisation for political action. Communities whose core is their identity may succeed in gaining official recognition, citizenship rights, inclusion in (or autonomy from) mainstream politics, or even the creation of a nation-state. In recent decades in various countries, indigenous peoples’ communities have sought each of these things. On the other hand, in peaceful democracies, the ordinary disagreements and negotiations between identity-based communities whose practices or political claims are at odds may become pressing issues. Powerful identity-based communities (or governments) can also spawn civil wars and the suppression of vulnerable, disfavoured identity-based communities. In the 1980s and 1990s, the most systematic cases of violence against identity-based communities in Europe, Africa and Asia produced the term ethnic cleansing. Moreover, identity-based communities may get labelled from the outside, especially by politicians and the media. The result may be an inaccurate portrait of the group and its members’ interests.

### Interest-Based Community

Interest-based communities exist to provide their members with benefits, whether recreational, economic, or political. To take as examples the business and environmental communities, organisations within these communities provide their members with an array of benefits such as bumper stickers, seminars, and inexpensive insurance, but they can still reasonably be called political communities because they are bound by a set of concerns that bear directly on the members’ political interests. The political quality of interest-based

communities does not evaporate if the members' political concerns are articulated as protecting the "public interest". The label community makes political sense only when applied to groups whose common interest include political goals. Politically, goldfish owners are not a community. Non-political interests may become politicized, though, as has happened with two well-publicized interest-based communities-divorced fathers and women with breast cancer. These communities began by providing emotional support and information to their members. It is important to know whether members of interest-based communities are merely paying dues to a far-off headquarters, or whether many members are active in the life of the organisation (Putnam, 2000).

Most mining communities have the characteristics of the various type of communities discussed above. According to Moody (2007), in theory, any party claiming to be potentially affected by the impacts of mining ventures may put themselves forward as stakeholders. In practice however, it is local people who have most difficulty getting authenticated. At the root of this anomaly is the definition of community. To Moody (2007) therefore, the concept of community has been subjected to a lot of scrutiny and cynicism. What is meant by a mining community may sometimes mean different things to different groups of people or stakeholders. The definition of a mining community may sometimes depend on the position and level of interest or influence of the one defining it.

As part of their Corporate Social Responsibility (CSR) or business strategies, mining companies, particularly, large scale ones make the effort to negotiate with selected community representatives (Akabzaa et al, 2007). Kapelus (2002) cited in Moody (2007) observes that sometimes the definition of community by mining companies is shaped in ways that restrict the number of claims upon them as business enterprises thus limiting their cost of production. Legitimacy in negotiations with these companies is left to local economic or traditional elites. Sometimes some of these agreements may not be acceptable to majority of the community members and this leads to suspicions and consequently, demonstrations and lack of goodwill towards each other. This weakens the social capital of such mining communities.

## **2.5. Summary and Lessons Learned**

The chapter has indicated that livelihood not only refers to people, their capabilities and means of living but also the ownership and articulation of information that are vital for the

effective utilisation of the assets people use to obtain a living. At the centre of livelihood discussion is people and their use of assets, which are both tangibles and intangibles, to survive. It also includes entitlements which determine their access to the assets.

Another significant lesson from the chapter is the nexus between sustainable livelihoods in its entirety on one hand and effective and meaningful poverty reduction on the other hand. Essentially, the chapter indicates that for livelihoods to be considered sustainable, it must be able to meet the needs of both the current and unborn generations. People should therefore have access to the assets for productive activities towards obtaining decent living standards. Sustainable livelihoods are contingent on careful planning in a participatory and all-inclusive manner. In order not to engender exclusivity in sustainable livelihood planning, the poor, who are most vulnerable, should be considered as major stakeholders in the planning process despite the little influence they have over the decision-making process.

With these understanding, the efforts aimed at promoting sustainable livelihoods in mine host communities should aim at the creation of social, economic, institutional and environmental conditions for both the current and future generations. Livelihoods that yield short-term gains, no matter their impact on the people and environment are travesty to the concept of sustainable livelihood. With these as the bases, livelihoods in mine host communities should not be solely dependent on the minerals which are finite commodities but must continue to guarantee decent standards of living even after closure of mines. This will forestall the development of ‘ghost towns’ which emerge after the closure of mines.

With the above understanding from the literature review, chapter three situates ASM activities within a theoretical framework. The “theory of dualism” which underpins the informal economy and the “tragedy of the commons” which better explain the nature of ASM activities are discussed after a general overview of ASM activities is given.

## **CHAPTER THREE**

### **GLOBAL AND NATIONAL PERSPECTIVES ON ARTISANAL AND SMALL-SCALE MINING**

This chapter critically examines Artisanal and Small scale mining (ASM) which is the focus of this work. The chapter highlights the nature of small-scale mining in general, its contribution to the global and national economy as well as the local economy of host communities in the Tarkwa–Nsuaem municipality. The discussion of the nature of ASM activities is also situated in the informal sector framework which describes the informal sector activities including that of the ASM and the tragedy of the commons which underpins the regard of the environment as a common-pool resource.

#### **3.1 Global Perspectives on ASM**

According to the Blacksmith Institute (2011), ASM refers to mining activities that use rudimentary methods to extract and process minerals and metals on a small scale. Hentschel et al (2002) on the other hand refer to the process as mining by individuals, groups, families or cooperatives with minimal or no mechanisation, often in the informal (illegal) sector. ASM mining can include activities as simple as panning for gold in rivers to as complex as development of underground workings and small scale processing plants. Artisanal miners work independently; mining or panning for gold using their own resources while small-scale mining includes enterprises or individuals that employ workers for mining but generally working with hand tools (International Finance Corporation, 2008).

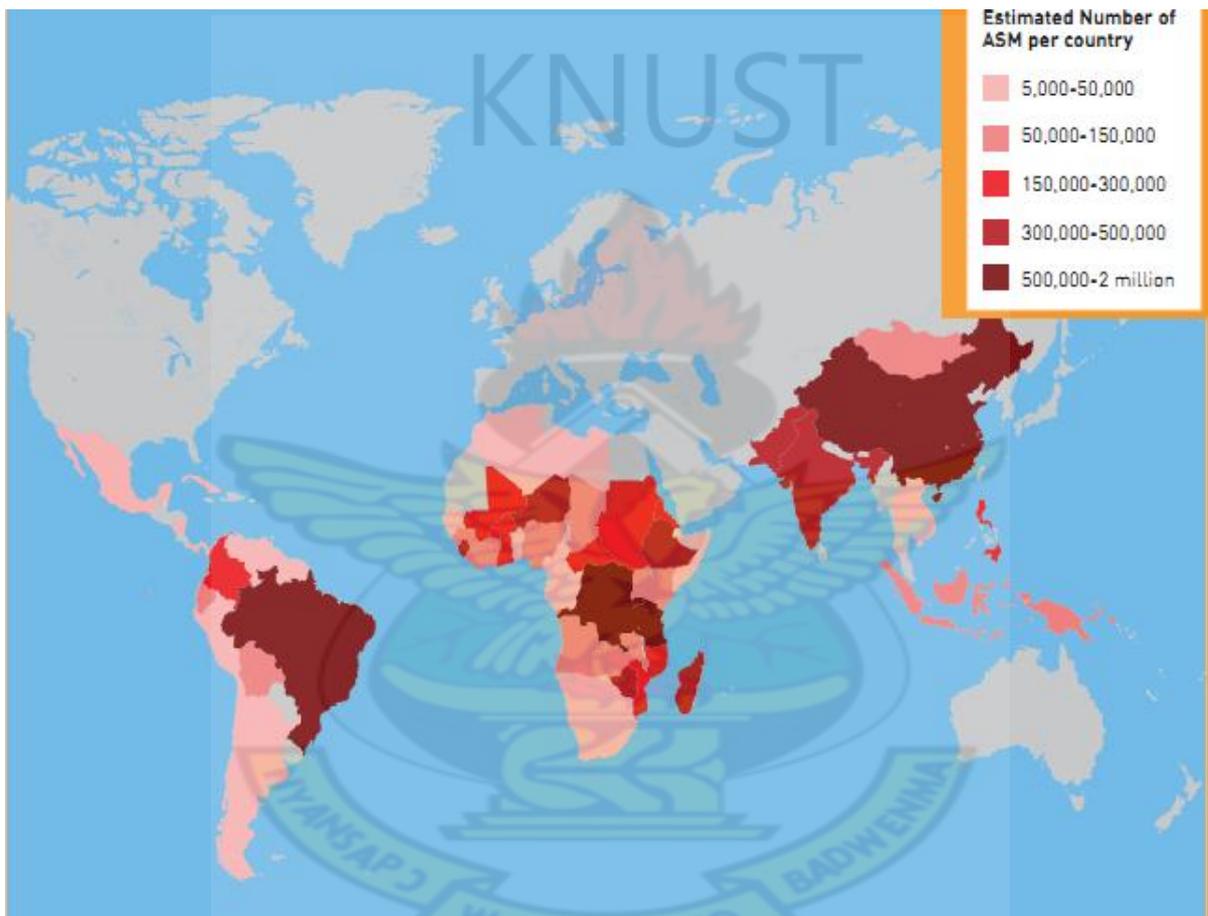
In spite of various attempts to define ASM, it is difficult to establish a common definition of the activity. According to Kambani (1998), numerous definitions of ASM exist globally and there is no universally accepted definition. Some countries however use the scale and level of technology to distinguish between the two. In this case, artisanal mining refers to the purely manual and on a very small scale while the small-scale mining refers to mining on a relatively larger scale and more mechanised. From the above, it can be concluded that the definition of ASM varies.

The commonalities among the various definitions are the size of the concession or areas of operation, investment volume, type and size of workforce, the geological framework, the mining history and the legal conditions. Thus ASM may refer to mining operations by firms

with small concessions and investment volumes dominated by the use of rudimentary methods of extraction.

According to Hentschel et al (2002), ASM takes place throughout the world and about 13 million people work in this sector. It is however widespread in developing countries as shown in Figure 3.1.

**Figure 3.1. ASM Activities around the World**



Source: International Finance Corporation, 2008

ASM activities are globally undertaken especially in countries of Africa, Asia, the Latin America and the Caribbean. Table 3.1 below indicates some of the major countries in the aforementioned continents where ASM activities are predominantly undertaken.

**Table 3.1. Major ASM Countries**

<b>Africa</b>	<b>Asia</b>	<b>Latin America and the Caribbean</b>
Ghana	China	Venezuela
Burkina Faso	India	Bolivia
Malawi	Indonesia	Brazil
Mali	Philippines	Ecuador
Mozambique	Laos	Peru
South Africa	Malaysia	Chile
Tanzania	Myanmar	Colombia
Zambia	Thailand	Dominican Republic
Central African Republic	Papua New Guinea	French Guyana
Congo		Guyana
Ethiopia		Mexico
Guinea		Nicaragua
Kenya		Surinam
Madagascar		
Namibia		
Nigeria		
Niger		
Sierra Leone		
Uganda		

Source: Hentschel et al (2002)

ASMs contribute significantly to global mineral production in the world. According to the International Labour Organisation (1999 cited in Hentschel et al, 2002), ASM accounts for between 15 and 20 percent of the world's non-fuel mineral production. It contributes up to 12 percent (i.e. 330 tonnes) to the annual gold production. ASM forms an important source of livelihood in many mineral rich countries. It is an important employment generating sector. The sector employs 13 to 20 million people from over 50 countries (The World Bank, 2005). It is however difficult to ascertain the exact number of people in this sector due to a host of factors. Some of these factors are; lack of official statistics, the informal nature of the sector, the number of seasonal and occasional workers and definitional issues (Hentschel et al, 2002). Hentschel et al (2002) again indicated that ASM provides an important source of livelihood for women. The sector traditionally employs larger numbers of women than large scale mining. Children are also employed in the sector especially in poor mineral rich communities. Children whose parents work in the sector are usually engaged in the sector.

Based on a comparison of the total population of ASM countries and the population involved in the ASM sector, countries such as Bolivia, Burkina Faso, Ghana, Mali, Papua New Guinea, Tanzania and Zimbabwe are the countries where the ASM sector is socially and economically most relevant.

### 3.1.1 Types of Minerals Extracted in the ASM Sector

Various types of minerals are extracted in the ASM sector. Some of the minerals mined are; gold, diamond, bauxite, iron ore, marble, limestone, silver, tin, zinc, construction materials and various types of gems such as emeralds and garnets. These minerals are mined on different scales in the various ASM countries. For instance, over 40 and 20 different minerals are mined in India and China respectively. In most countries, the activities centre on particular minerals. In Ghana and Ecuador for instance, gold constitutes two thirds of production while it constitutes 90 percent in the Philippines and almost 100 percent in Peru. The volume of minerals produced by the sector varies between countries and between operations within countries (Hentschel et al, 2002).

### 3.1.2. The Impact of ASM Activities

Globally, a lot of concerns have been raised over ASM activities. The environmental cost of the activity is higher than those of large scale mining companies. ASM produces negative impacts on the physical and social environment during various stages of mining; that is exploration, exploitation, processing and closure. Notable environmental problems in the sector include chemical pollution for example, cyanide and mercury pollution; noise pollution; pollution of rivers and other water bodies through direct and indirect dumping of tailings<sup>2</sup> and effluents, improperly constructed tailings dams (i.e. mine dumps), acid rock drainage, river siltation and damage in alluvial areas. Other environmental problems are; landscape destruction through pitting and heaping of sands, deforestation and destruction of forest reserves, diseases such as lung and skin diseases and malaria. Other impacts of ASM are cultural damage due to invasion of sensitive traditionally sacred areas such as grooves and other traditionally sacred places and child labour.

The ASM related environmental problems are caused by a host of multiple factors. Some of these factors include lack of information about good practices; inadequate environmental

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<sup>2</sup> Tailings, also called mine dumps, are the materials left over after the process of separating the valuable fraction from the uneconomic fraction (gangue) of an ore.

legislation, lack of control and enforcement of mining laws; inefficient technology or lack of access to better technology, economic limitations and lack of knowledge, education and training (Hentschel et al, 2002).

In view of the above, numerous assistance programmes for the environment have been carried out in most ASM countries with the help of various multilateral and bilateral organisations. For example; the then German Gesellschaft für Technische Zusammenarbeit (GTZ now Gesellschaft Internationale Zusammenarbeit) programmes in Ghana, Colombia and Zimbabwe, while the United Kingdom's Department for International Development (DFID) has a model scheme of assistance to small-scale miners. The Collaborative Group on Artisanal and Small-Scale Mining (CASM) which is an initiative of the World Bank serves as a valuable instrument for donor coordination, experience and information exchange and the channelling of funds for ASM activities. United Nations Organisations such as United Nations Department of Economic and Social Affairs (UNDESA), United Nations Development Programme (UNDP), United Nations Industrial Development Organisation (UNIDO) and the International Labour Organisation (ILO) are important multilateral donor agencies which have helped the ASM sector in many countries in various ways. International Non Governmental Organisations such as the Intermediate Technology Development Group (ITDG), Conservation International and International Union Association also have ASM-related programmes.

The understanding of ASM has increased in the international development community over the years. Consequently, the approaches taken have also changed. For instance; in the 1970s, definitional issues were of concern while technical issues were of concern in the 1980s. In the early 1990s, the international development community was concerned about the integration of technical, environmental, legal, social and economic issues. From the middle to late 1990s, the concern was on the relation between large scale mining companies and ASM, gender, child and labour issues. Generally, special attention on legalisation of ASM sectors became an area of concern in the 1990s. In the year 2000 and beyond, community related issues and sustainable livelihoods are areas of concern to the international development community and this is the focus of this study (Hentschel et al, 2002).

In spite of the negative impacts, ASM activities have positive impacts. ASM contributes immensely to rural and regional development in many countries in Africa, Asia and Latin

America where the activity takes place. It can play a crucial role in poverty reduction and rural development. In many mineral rich countries, it is the most promising source of livelihood, particularly in remote rural areas.

### **3.2 ASM Operations in Ghana**

The Ghanaian government adopts a definition of small-scale mining based upon concession size. In principle, a small-scale mining operation in Ghana is that which is based on a land plot measuring less than 25 acres (World Bank, 1995). The Small Scale Gold Mining Law (PNDCL 218) of 1989 section 21 defines small-scale mining as “the mining of gold by any method not involving substantial expenditure by an individual or group of persons not exceeding nine in number or by a cooperative society made up of ten or more persons.” The law also indicates the sizes of concessions (5-25 acres) that small-scale miners are entitled to. It stipulates that a concession may not exceed 10 hectares (25 acres). The law does not allow the use of explosives. In a Commissioned Report on the Ghana Mining Sector Programme, Styles et al (2006) opine that from this definition, both artisanal and small-scale mining share common characteristics such as; exploitation of marginal or small deposits, limited capital, labour intensive methods of extraction with low rates of recovery, poor access to markets and support services, low standard of safety and health and significant adverse impact on the environment. It is sometimes difficult to make a distinction between the two typologies of mining due to these common characteristics. The two terms are however used interchangeably by many writers and local people. Artisanal and small-scale mining will therefore be used interchangeably in this study to mean one and the same thing.

Illegal small-scale gold or diamond mining is commonly referred to as “galamsey” (Amankwah and Anim-Sackey, 2004). Galamsey is believed to have originated from the English expression “gather them and sell”. The history behind this local parlance is that during the colonial era, the Syrians and Lebanese who were engaged in illicit trade of gold constantly persuaded the local people to “gather and sell gold”. The local people pronounced this phrase as “gal-am-sey”. The Syrians and Lebanese who were involved in this trade were referred to as galamsey and with time, it became the name for illegal artisanal mining activity.

### 3.2.1. Historical Perspective

According to Hilson (2001), ASM activities in Ghana dates back to the 6<sup>th</sup> Century. Styles et al. (2006) speculate that the exploitation of gold by traditional artisanal methods has taken place in Ghana for over 2,500 years. Hilson (2001) maintains that there is wealth of evidence indicating that the precious metals recovered from regional artisan activities were attracting Arab traders to certain areas of the country as early as the 7<sup>th</sup> and 8<sup>th</sup> centuries AD. Mining was done on artisanal basis long before the Europeans first landed on the coast of Ghana. The rich gold deposits of the Western Sahara were largely responsible for the wealth and strength of large ancient West African empires and cultures such as the Ghana, Mali and Songhai empires between the 11<sup>th</sup> and 16<sup>th</sup> centuries (Botchway, 1995; Tsikata, 2007). Revenues derived from gold provided one of the most important building blocks for state formation and consolidation in all the important Akan kingdoms such as the Asante, Akwamu, Akyem and the Wassa Fiase Kingdoms.

From the 15<sup>th</sup> century, European traders such as the Portuguese, Dutch, Swedish, Spanish, Flemish, French and British fought for the possession of the mineral rich region. The gold trade with these European countries was based on traditional artisanal mining. This trade reached its peak in the 16<sup>th</sup> century and flourished for centuries before the advent of mechanised mining. Of all the principal minerals in Ghana, gold has been worked longest. It was extracted from easily worked alluvial materials deposited on river terraces. The amount of gold extracted between 1471 and 1880 was about 14,450,000 ounces (Styles et al., 2006).

The foregoing was incident before modern mining involving the use of machinery and the working of both alluvial deposits and ores began in about 1880 in the Tarkwa area. Pierre Bonnat (a Frenchman) who was prospecting in the Tarkwa area first reported the possibility of mining gold in the area in 1877 (Dickson and Benneh, 1988). This led to the famous Wassa gold rush in 1877-1885. In spite of the introduction of mechanised modern mining, traditional artisanal mining was the main gold extraction method. Continued colonial expansion towards the end of the 19<sup>th</sup> century however led to the demarcation of European mining concessions and the increased oppressive control over traditional mining by the British colonial authorities (Styles et al, 2006).

According to Amankwa and Anim-Sackey (2004), the Gold Mining Products Protection Ordinance (CAP 149) of 1905 prevented the indigenous people from dealing in gold. The

Mercury Ordinance passed in 1932 made it illegal for Ghanaians to own mercury. After independence, the Minerals Act of 1962 vested all minerals in the President for the people of the Republic of Ghana. The Minerals (Control of Smuggling) Act of 1965 made the purchasing or sale and processing of gold illegal without a license. The Law also outlawed small-scale mining activity. These laws made small-scale mining of gold illegal until 1989.

Since the legalisation of small scale mining, two types of small-scale mining have emerged. These are legal and illegal miners. The legal small-scale miners are those who have acquired mining licenses from the Minerals Commission to cover their concessions. According to the Minerals Commission (2002), 12 years after the regularisation exercise, 420 small –scale mining concessions had been licensed in the country by the end of 2001. Nine out of these were diamond licenses while the remaining 411 were for gold. These legally licensed mines provided employment for over 100,000 miners.

Small-scale mining in Ghana, as in most developing countries, was for decades treated as an informal industrial sector, employing thousands of people but featuring largely rudimentary, unmonitored and uncontrolled practices. Until the 1980s, small-scale mining activities in Ghana remained largely unregulated and received little, if any, support from governmental bodies. This, however, changed with the introduction of the Economic Recovery Programme (ERP), which, following years of careful planning, was finally launched in the mid-1980s (Aryeetey, et al, 2004). In a desperate move to revitalize a stagnating economy, the then Provincial National Defence Council (PNDC) government consulted authorities from both the World Bank and the International Monetary Fund (IMF) to assist in the drafting of national economic plans and policies (Hilson, 2001; Tsikata, 2007). According to Mireku-Gyimah and Suglo (1993 cited in Corral and Earle, 2009), the mining industry in Ghana experienced very wide fluctuations in mineral production with a general downward trend. The Ghanaian minerals sector was therefore heavily targeted. Between 1960 and 1980, it experienced mass declines in mineral output: gold production had declined from 900,000oz in 1960 to 232,000oz in 1982; manganese output had dropped from 600,000t in 1960 to 160,000t in 1982; bauxite production declined from 407,000 in 1974 to 64,700t in 1982; and diamond output had declined from 2,340,000 carats in 1975 to 683,524 carats in 1982 (Minerals Commission, 2000).

Consequently, a committee on gold was set up to investigate the causes of the downward trend in gold production (Anon, 1980 cited in Amankwah and Anim-Sackey, 2004). The significance of small-scale mining was recognised and the government regularised it in 1989 when the Small Scale Gold Law (PNDCL 218) of 1989 was promulgated. It was basically to recognise the potential of small-scale mining output and to capture the potential into the mainstream economy (Al-Hassan et al, 1997). The Government of Ghana formalised the sector after identifying the potential earnings in the industry which would have been largely lost under an informal organizational scheme through smuggling channels to neighbouring countries such as Togo, Burkina Faso, Nigeria and Liberia (Hilson, 2001).

### 3.2.2. Small-Scale Mining and Revenues: Post Legalisation of the Sector

Significant revenues have been generated in the mining sector in Ghana since the small-scale mining segment was legalised in 1989. According to the 2004 report of the Minerals Commission, a total of 1,743,881oz (US\$562.6 million) was officially produced between 1989 and 2004. Between 1990 and 2000, ASM contributed 5 percent and 67 percent of the annual gold and diamond production respectively. Between 1989 and 1994, 30,000 small-scale miners reportedly produced and sold \$68.56 million in gold to governmental offices. Small-scale gold production rose from 17,234oz in 1990 to 107,093oz in 1997 (Hilson, 2001). According to Amankwa and Anim-Sackey (2004), the small-scale mining sector sold about 1.5 million ounces of gold and 8.0 million carats of diamond to the Minerals Marketing Corporation (PMMC) and other licensed precious minerals buying agencies by the end of 2003.

### 3.2.3 Legal and Regulatory Framework for Small-scale Mining in Ghana

The Government of Ghana was one of the first African governments to acknowledge the need to try to regularise and formalise ASM operations as a means to improving the sustainability of the sector (Hilson, 2001). The Ghana Minerals Commission which is the institution responsible for all policymaking and regulatory activities in the ASM industry was established under the Minerals Commission Law of 1986. It helps to formulate government policies with respect to exploration for and exploitation of mineral resources and to handle 'all public agreements relating to mining' (Hilson, 2001). The Small-scale Mining Law (PNDCL 218) led to the establishment of the Small-scale Mining Project within the Ghana Minerals Commission. The small-scale mining project which is now the Small-scale Mining

Department has the responsibility of providing technical assistance to prospective and registered small-scale miners as well as promoting their activities.

The regularisation process also included the establishment of a Small-scale Mining Implementation Committee comprising the Minerals Commission (MC), Mines Department (MD), Geological Survey Department (GSD) and the Precious Minerals Marketing Corporation (PMMC). This committee was responsible for the management of the implementation of a project known as the regularisation of Small Scale Gold and Diamond Project. The key tasks of the committee included the demarcation of eight mining districts and the establishment of District Small-scale Mining Centres (DSSMC). Through this project, the MC was to recruit district officers for the project; the MD was to recruit mine wardens and the GSD was to help with the officers for the project (Styles et al, 2006). The Precious Minerals Marketing Corporation (PMMC) Law, PNDCL 219 created an authority to buy and sell gold and diamonds (Anon, 1989 cited in Eshun, 2005). PMMC has licensed buying agents and sub-agents throughout mining areas (PMMC, 2001). These agents buy diamonds and gold for resale to the corporation. The Government of Ghana also granted buying licenses to private companies to purchase gold from small-scale miners.

The Minerals Commission is responsible for the majority of the regulatory and policy-making tasks pertaining to the ASM sub-sector through its Small-Scale Mining Department (SSMD). The SSMD's key mandate is to secure an optimum contribution of the ASM of relevant minerals to the Ghanaian economy. As part of the decentralisation support system, the SSMD delegates through the DSSMCs. By 2006, there were seven district DSSMCs located in areas of intense small-scale mining activities. These areas are; Tarkwa, Assin Fosu, Akyem Oda, Dunkwa, Asankragwa, Bibiani and Bolgatanga. Each of these centres is staffed with a district mines officer and mines warden. The DSSMCs form outreach stations and serve to disseminate government policies on small-scale mining and to offer extension services in appropriate mining, processing, environmental and health and safety issues. These centres are supposed to serve as the interface between the miners, District Assembly structures and the MC in the area of licensing and are responsible for initiating the licensing process.

There are many tedious and sometimes cumbersome processes that an individual has to go through before he or she obtains a small-scale mining licence. The process involves the

completion of several forms, and final approval from governmental authorities. When a prospective applicant notifies the local DSSMC of the intention to apply for the SSM licence, the resident mines officer will then evaluate the chosen site to determine its suitability. If deemed appropriate, the area is demarcated and site plans are prepared. A notice of intention to allocate the area for SSM is published by the District Assembly, for a period of 21 days and if no objections are made to the notice the District Chief Executives recommend to the DSSMC to authorise the application. The applicant then completes the necessary forms and maps which along with an Environmental Impact Assessment (EIA) statement are then submitted to the Minerals Commission in Accra. A number of criteria must be met, and several restrictions apply. The law places a lot of obligations on licensed small-scale miners. However, the enforcement and hence the impact of the law has failed to meet the intended expectations and that could be attributed to the large number of illegal artisanal miners (galamsey) in the country.

According to the Small-scale Mining Law, (PNDCL 218) the classification and registration criteria for small-scale mining are:

- Licenses granted to only Ghanaian nationals;
- A license issued to an individual shall not exceed three years but can be renewed for a period of not more than three years for two consecutive terms;
- A license issued to a co-operative shall last for a period of five years but is renewable for a period no longer than five years for two consecutive terms;
- A group of individuals not exceeding four shall be granted an area no more than three acres; a group exceeding four but not more than nine shall be granted an area not more than five acres; and a company or a co-operative society shall be granted an area not exceeding 25 acres;
- An applicant must complete the application form fully and have it endorsed by the district administration;
- Although all small-scale miners are exempted from payment of taxes and royalties for the first three years of operation, they are not exempted from local imposts; and
- After successful application, the mine operator must erect concrete posts at the corners of the concession on top of the four discs (with number engraved) provided; the edges of the concession must be kept clear for concession purposes; and

successful applicants must also erect a signpost within the concession with their name and number written on it (Hilson, 2001).

Separate prospecting licences are issued to individuals, which give a holder the exclusive right to search for specific minerals using geological and geophysical means. The initial grant of the licence is limited to a maximum area of 150km<sup>2</sup> over a period of three years, although it may be renewed for another two years. Most commonly, however, the plots of land issued to register small-scale miners have already been geo-prospected, in which case, exploration is not needed. When a prospective applicant notifies a local branch of the Minerals Commission of his or her intentions, a representative evaluates the chosen site to determine its suitability. If deemed appropriate, the area is then demarcated and site plans are prepared; a notice of intention to allocate the area for small-scale mining is published by the District Assembly for a period of 21 days, and if no objections are made, the applicant completes the necessary forms, which, along with an environmental impact assessment statement, are then submitted to the Minerals Commission in Accra (Minerals Commission, 2000). A Small-Scale Mining Unit has been established within the Minerals Commission to handle these and related responsibilities (Hilson, 2001).

Prospecting is not permitted before the acquisition of small-scale mining license legally. Locations of potential reserves are identified accidentally or based on the knowledge and experience of old miners. Prospecting is therefore haphazard and the techniques used are crude. The laws and policies that constitute the Ghanaian small-scale mining regulatory framework are outlined in Box 1. From this, it is obvious that there are adequate laws and policies to ensure that responsible mining takes place in the sector but this is an issue of concern in Ghana. Enforcement of the laws and regulations in this sector is difficult. This is due to several factors such as, lack of logistics and qualified personnel and lack of political will.

## **Box 1: Small-Scale Mining Regulatory Framework in Ghana**

### **General Mining Laws**

- Minerals and Mining Act, 2006 (ACT 703)
- Minerals and Mining Law (PNDCL 153)
- Minerals Commission Act, 1993 (Act 450; formerly PNDCL 153)
- Small Scale Gold Mining Law, 1989 (PNDCL 218)
- Diamonds (Amendment) Law (PNDCL 217)
- Environmental Protection Council Decree, 1974 (NRCD 239)
- Precious Minerals Marketing Corporation Law, 1989 (PNDCL 219)
- Diamonds Decree, 1972 (NRCD 32)
- Additional Profit Tax Law, 1985

### **Regulations**

- Mining Regulations, 1970 (LI 665)
- Explosives Regulations, 1970
- Minerals (Royalties) Regulations, 1987

### **Small-scale Mining Enactments**

- Diamond Mining Industry Protection Regulations, 1927 (No. 9/ 1927)
- Concessions Ordinance, 1939 (c.136, Laws of G.C. 1951 Revision), s.38 and Form of Schedule
- Gold Mining Products Protection Ordinance (c.149, Laws of the Gold Coast, 1951 Revision)
- Mining Health Areas Ordinance (c. 150, Laws of the Gold Coast 1951 Revision)
- Mining Health Areas Regulations, 1935 (Vol. VIII, 1954 Laws of the Gold Coast p. 1123)
- Prospecting & Digging License Regulations, 1950 (Vol. VIII, 1954 Laws of the Gold Coast, p. 1032)
- Minerals Regulation, 1962 (L.I. 231), especially regulation 1 and Form 5 of the first schedule
- Minerals Regulations, 1963 (L.I. 253)
- Mining Regulations, 1970 (L.I. 665), especially regulations 4,6,10 and 194–205
- Explosives Regulation, 1970 (L.I. 666)
- Diamonds Decree, 1972 (NRCD 32) (as amended by the PNDCL 216)
- Minerals and Mining Law, 1986 (PNDCL 153, especially Part X – s.73-76, and s.77)
- Mercury Law, 1989 (PNDCL 217)
- Small-Scale Gold Mining Law, 1989 (PNDCL 218)
- Precious Minerals Marketing Corporation Law, 1989 (PNDCL 219)
- Minerals Commission Act, 1993 (Act 450)
- Environmental Protection Agency Act, 1994 (Act 490)
- Water Resources Commission Act, 1996 (Act 552)
- The 1992 Constitution of the Republic of Ghana

### **Relevant Codes of Practice**

- Code of Practice of Small-scale Gold-mining Operations
- Ghana's Mining and Environmental Guidelines

Source: Hilson (2001) and Styles et al (2006)

### 3.2.4 Organisation and Mining Methods Adopted by ASM Groups in Ghana.

ASM groups have organised themselves in many ways to extract minerals in various parts of the country that are mineral rich. These ASM groups range from groups of relatives or family members, ethnic based groups to groups of individuals who have a common goal of being engaged in the activity in order to gain some income. Whether legal or illegal, these groups usually have leaders and sub-leaders who see to the mining operations. These leaders are usually the concessionaires or people appointed by them in the case of the legal ASMs or they are family heads, owners of the land or the people who first discovered minerals in the areas of operation.

Over the years, people in the ASM sector have used various local technologies to extract gold and other minerals. According to Hilson (2001), the most common equipment used are basic hand tools such as pickaxes, sluice boxes and shovels, and occasionally Honda water pumps, explosives and washing plants are seen within regions. Even the sites that feature the most advanced of machinery are, for the most part, rudimentary in design. However, Styles et al (2006) are of the view that although it is claimed that the current ASM methods are archaic and crude and sometimes maladapted from the large scale mining sector, throughout the many centuries of gold mining in Ghana, the indigenous artisanal miners have been innovative, having developed their own tools and technology and have been far from static or backward. Styles et al (2006) however concede that there is still considerable room for improvement in terms of technology in this sector of mining. Many people in the ASM sector in Ghana use inappropriate technology and have limited access and knowledge of geology. Mine planning and grade control are rudimentary and the equipment used in most cases are also rudimentary. Even though in recent times, some Chinese investors or businessmen have introduced excavators (popularly known as “chanfan” machines) which could either be bought or rented, many of the ASM groups still use the rudimentary and old techniques because they cannot afford the excavators. The techniques, tools and equipment used for routine unit operations are usually inadequate and labour intensive. Consequently, the ASM miners work long hours.

Basically, there are four main methods of gold mining in the ASM sector in Ghana. According to Styles et al (2006), these are:

- Washing and panning for alluvial gold along the banks of streams and rivers;

- Shallow near-surface pit alluvial/eluvial mining;
- Underground hard rock (reef or lode) mining; and
- Reworking tailings from the old LSM mines.

The washing and panning for alluvial gold along the banks of streams and rivers has been in practice in Ghana for centuries. The most common method of working alluvial river gravels is to dig small pits in the gravel beds of small and slow moving streams or in eddying pools on the shallow banks of larger rivers. The shallow near-surface pit alluvial mining often takes place on either crests or sides of hills or is in sedimented valleys of ancient riverbeds. With this method, deeper alluvial and near surface oxidised primary deposits are exploited. The workers either dig small circular pits or larger excavations until the gravel horizon is located. Usually, the pits are unbenched but sometimes they are stepped in terraces to ensure stability.

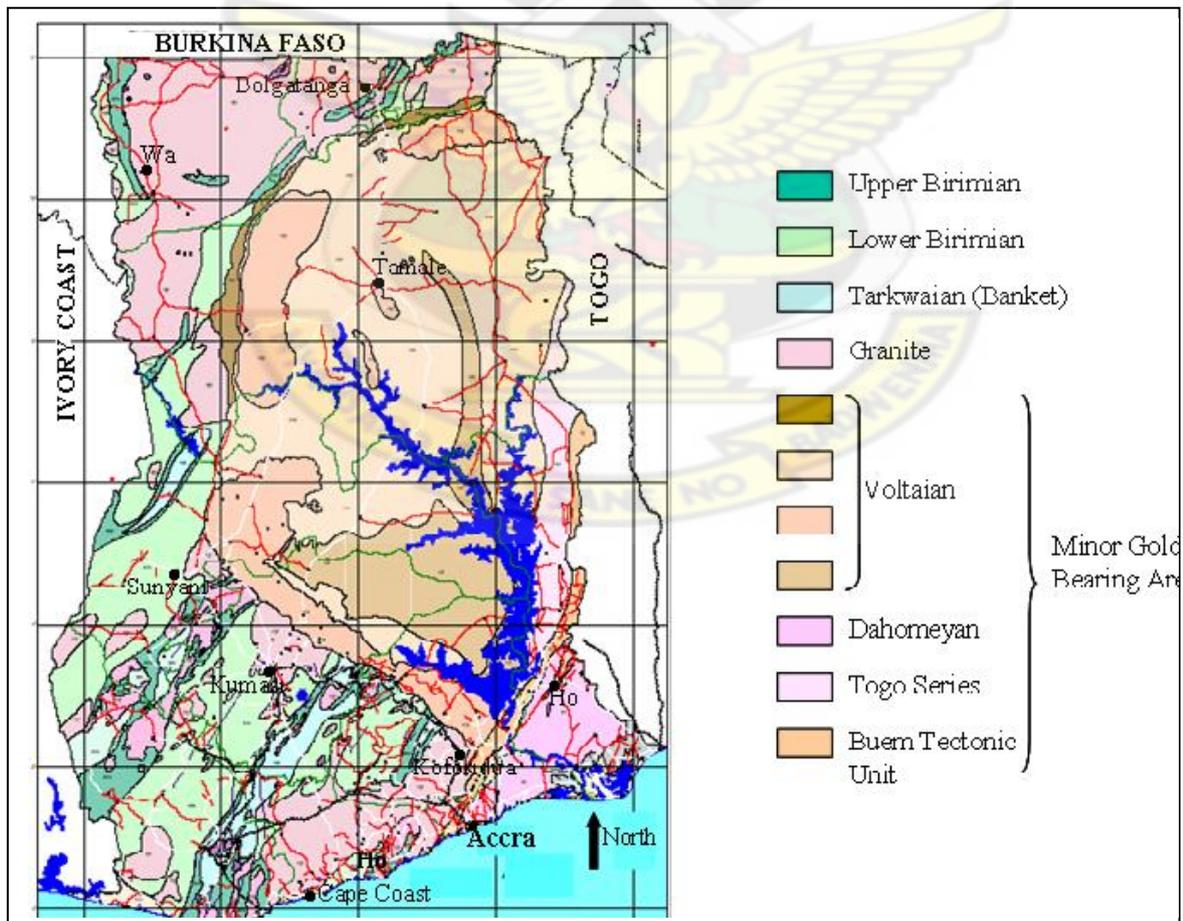
With the underground hard rock mining, the miners employ narrow vertical or inclined shafts for access to the ore body. Shafts (ghettos) range in size depending on the shape. For instance, one to two meters in diameter if circular or one meter by one to two meters for square and rectangular shafts. The depths range between 10 – 50m. They occur in various shapes ranging from chimney type, to rectangular type to sloping types with steps cut in, and long ‘snakelike’ tubes that bend to follow the line of the reef. The miners selectively mine by following the mineralised vein although this is not always easy or possible and many prove barren.

In most underground operations the miners work in confined spaces with poor ventilation and lighting. A variety of tools are used to loosen and excavate the ore especially when in the form of weathered quartz veins. Reworking tailings from the old LSM mines usually is done at abandoned LSM sites or sites ceded out to galamsey groups through special arrangements. This is also usually a source of conflict between ASMs and LSMs in mining communities. The tailings of old or closed down mines are a source of ore for many ASM in mining communities such as Prestea, Tarkwa, Obuasi and Bogoso. Some of these tailings are said to contain very good grades.

### 3.2.5. Minerals Extracted by Artisanal and Small Scale Miners in Ghana

Gold mineralisation in Ghana is generally associated with the two geological units; the Birimian and Tarkwaian systems. The rocks in both systems are folded and the folded axes trend NE-SW as shown in Figure 3.2. The Birimian system consists of shales, silts, greywackes, tuffs, manganeseiferous sediments and an upper meta-volcanic unit. The Tarkwaian system consists of clastic sediments represented by conglomerates, quartzites, arkostic rocks and minor phyllites. Gold in the Birimian system typically occurs as the Disseminated Sulphide Type (DST) and the Quartz Vein Type (QVT) (Leube et al., 1990 cited in Styles et al (2006)). The weathering of these various types has produced the alluvial and elluvial deposits many of which are the targets for ASMs. Gold mineralisation in the Tarkwaian system is associated with the conglomerates of the Banket Series. They are an accumulation of high energy, coarse clastic rocks that have suffered low –grade metamorphism. Four conglomerates known locally as reefs have been identified in the Tarkwaian system (Kesse, 1985 cited in Styles et al (2006)).

**Figure 3.2. Gold Bearing Map of Ghana**



Source: Annon, 2008 cited in Amankwah et al., 2010

There are many ASMs as well as LSMs scattered all over the Birimian and Tarkwaian systems. The ore amenable to ASM operations include the hard rocks, their partially weathered varieties, and the alluvial and alluvial deposits derived from the weathering of these reefs. ASM operations in these systems have been enhanced due to the long exposure to the tropical weathering conditions that have altered the reefs and made them soft and friable, releasing the gold. Rivers and streams flowing over these weathered systems have produced several alluvial plains that are highly rich in gold and are also amenable to ASM operations. The Birim, Offin, Ankobra, Bonsa and Bonte rivers are some of the major rivers in Ghana whose banks have been exploited by ASM (Styles et al, 2006). This has led to the pollution of these Rivers. Plate 3.1 shows the effect of galamsey activities along the Ankobra River in Prestea.

**Plate 3.1. The Effect of Galamsey Activities along the Ankobra River in Prestea.**



Source: Environmental Protection Agency, Tarkwa Municipal Office.

Many of the techniques and equipment used for processing and mineral dressing such as comminution, scrubbing, screening and concentration are crude and the overall recovery is very low. The principal methods of gold recovery in the ASM sector of Ghana are winnowing and amalgamation. Winnowing is a dry sorting process which relies on different specific gravities of the minerals within a concentrate. This method is commonly referred to as the ‘Blow and Tap’ and is practised in areas where the gold is particularly coarse. The method has been used in the country for centuries by traditional small scale miners. The method is

less expensive and its main advantage is the fact that no chemical is used. At the Zugu and Teshie sites in the Bolgatanga area of the Upper East region, the ore is dried and pounded using a wooden club. It is then poured from one calabash to another from a standing height and thereby relying on the natural air movement to remove the fines. Amalgamation is a process in which gold is mixed with mercury. Gold has a strong affinity for mercury in preference to water and the mercury is said to 'wet' the gold concentrate. The gold particles adhere to the mercury, forming a pasty, dough-like amalgam and causing the gold to separate from the black sand particles. This method is efficient for gold recovery but has serious health and environmental consequences. This process usually takes place close to residential areas as well as food preparation areas in mining communities.

### 3.2.6. Support for the ASM Sector in Ghana

Various forms of assistance have been given to the ASM sector in Ghana since 1990. In 1991, the World Bank and the erstwhile GTZ (now GIZ) attempted to improve the technological aspect of ASM. This was done through the Promotion of Small Scale Mining Project (PSSMP). Under the project, ten water pumps were purchased to be rented out to miners for a small fee. The project was not successful for the fact that the pumps were over used by the miners and quickly broke down and also the miners reneged on payment. Again, through the help of the GIZ, the Minerals Commission (MC) attempted to organise a micro-credit scheme that granted loans at subsidised rates. This scheme provided loans to miners initially but faced repayment problems. The MC consequently terminated the scheme and tried to encourage rural banks to implement a similar scheme (Styles et al, 2006).

Shortly after the pump rental failure, the MC consulted the Central Regional Development Commission (CEDECOM) which was implementing a hire-purchase system for fishermen and small scale farmers for support. The scheme which was implemented in 1993 was found to be unsustainable and highly ineffective mainly because CEDECOM, which had had no interaction with small-scale miners in the past, used information drawn heavily from experiences with small-scale fisheries for the small scale sector. Some of the hire equipment was found to be inappropriate and also, the interest rate for the hire purchase scheme where the repayment period was only one year was too high. The Minerals Commission discontinued the scheme, sold newly purchased equipment at discounted prices, and again, returned the remaining funds to the Small Scale Mining Project (Hilson, 2001).

The World Bank has been involved in small-scale mining research in Ghana for over two decades. The most notable one is, the Mining Sector Development and Environment Project, which was started in 1996 after the initial workshop in 1994. The aim of the project was ‘to support the sustainable development of Ghana’s mining sector on an environmentally sound basis through the application of improved technologies and strengthened mining institutions’. A substantial amount of the project fund was on ASM. As far as small-scale mining was concerned, the project sought to provide pilot testing of small-scale mining equipment for improving productivity and yields; making available valuable geological information to small-scale miners; improving the regulatory framework for small-scale miners; and reclaiming abandoned land. The World Bank did provide some input into most of the aforementioned initiatives but many of these support services and strategies have since disintegrated, particularly the environment related activities (Hilson, 2001). The project was completed in 2002.

According to Styles et al (2006), the MC again with GTZ assistance attempted to introduce metal retorts to artisanal miners in 1993 as part of its efforts in the Mercury Pollution Abatement Initiatives. This project was again not successful since the miners rejected the new technology that was developed without their participation. In recent times, an extensive research has been carried out by the British Geological Survey (BGS) in collaboration with Wardell Armstrong and the University of Mines and Technology for the European Union Development Fund Mining Sector Programme in Ghana (Armstrong, 2008). The project is basically focused on Mercury Abatement in the artisanal and small-scale mining sector in Ghana. The level of acceptance is low

From the above it can be said that a lot of efforts have been made to assist the ASM sector in Ghana since the early 1990s. GTZ and the World Bank as well as the European Union have been instrumental in these efforts yet little impact has been made in the ASM sector in Ghana.

### **3.3. Theoretical Framework**

The nature of ASM activities in Ghana reviewed under sub-section 3 immediately brings to the fore the “classical theory of the informal sector” and the “tragedy of the commons” as the theoretical underpinning. The advocacy and communicative planning theories are also

identified as theories that underpin the operations of the ASM workers and the need to ensure environmental harmony.

### 3.3.1. The Classical Theory of Informal Sector

The Classical Theory of Informal Sector was postulated by Gibson and Kelley in 1994 after observing that the theoretical expositions about the informal sector were scattered. According to Gibson and Kelley (1994), the unifying principle which underlies literature on informal sector is that it (i.e. informal sector) arises from the capital-limited nature of the economy where capital is in short supply. The notion is that the informal sector is limited by exogenously given level of demand which forces unemployed workers into the informal sector. Gibson and Kelley (1994) observe that the informal sector produces neither capitalists nor workers but rather they constitute a distinct social class.

Relative to LSM activities, ASM activities are less capital intensive. The ASM activities have emerged due to the inability of the labour force to be employed in the LSM firms owing to the mismatch of skills. As a generalisation, informal sector technologies including the ones used by the ASM workers are rudimentary and labour productivity is characteristically low (Gibson and Kelley (1994). According to IIED and WBCSD (2002) and Clausen et al. (2011), ASM activities in international development circles are identified as the most rudimentary branch of the mining sector. It is usually defined as a low tech, labour intensive mineral processing and excavation activity. Clausen et al. (2011) add that most ASM takes place in the informal sector, outside legal regimes. Estimates indicate that about 90 percent of artisanal miners operate informally and thus illegally.

In sum, the rudimentary technology, labour-intensiveness but limited number of employees per firm, largely illegal and low productivity attributes of ASM situates the sub-sector perfectly into the informal economy hence the Classical Theory of Informal Sector as a relevant theoretical underpinning.

### 3.3.2. The Tragedy of the Commons

As exemplified by Hardin's theory of "the Tragedy of the Commons" in 1968, the ASM workers obtain the ore from an environment treated as common-pool resource for their individual economic satisfaction (Ghatak, 2005; Hardin, 1968 in Agyeman et al., 2012). This

phenomenon is supported by earlier Clausen and other's position that most ASM takes place in the informal sector, outside legal regimes.

Treating the environment which is the source of the mineral ores as common-property resource, ASM workers even encroach onto the concessions of LSM firms. Furthermore, owing to the treatment of the land as common-property, inhabitants in the mining communities look up to the LSM companies for employment. The LSM thus give priority to the inhabitants of these mining-host communities in times of employment. Where, the LSM companies are unable to employ the inhabitants due to mismatch of skills, the inhabitants take to ASM activities by sometimes encroaching on the LSM companies' concessions, as a way of compensating themselves. The ASM treat water bodies they process their ores in as common-property resources and are mindless of polluting them. They expose mercury into the environment with impunity while not remedial action is taken to reclaim the lands the mine on.

The ramifications of the activities of the ASM workers are however borne by the entire society. Diseases associated with the ASM activities do not only affect the ASM workers but the entire members of the society. The tragedy of the commons thus underpin the operations of the ASM workers due to the treatment of the mineral bearing land as common-property which individuals are to exploit for their individual interests but the consequences are borne by the entire society.

### 3.3.3. Relevant Planning Theories

Beside the "Classical Theory of Informal Sector" and the "Tragedy of the Commons" identified to underpin the activities of ASM workers, several other planning theories appear to explain the activities of ASM workers. Their prescriptions seem relevant to strike a balance between economic and social development as well as environmental sustainability. The planning theories used in this study include the advocacy theory and the communicative/collaborative theory.

#### *Advocacy Theory*

The advocacy planning was developed during the "Great Society" era of the 1960s. It attached the fundamental notion of a single, common public interest. Paul Davidoff in his scholarly work "Advocacy and Pluralism" argues that unitary planning perpetuates monopoly

over planning power and is a disincentive to participation (Davidoff, 2003 cited in Healey, 2005). The perspective shared by the advocates of the theory is that frequently the people who were adversely affected by plans are not involved in decision making or their concerns are neither represented nor considered in the planning process. These groups who are mainly primarily low income and disadvantaged populations have little, if any, political power to influence the planning process.

In advocacy planning, the planner represents the position of the disenfranchised against the position of the powerful, and takes on the role of the adversary to plans developed by synoptic processes. Davidoff argues that for planning to be inclusive, to forestall conflicts and the associated reactions, it must not pretend that a single agency can represent the interest of a divergent and conflicted society. Instead, planning must promote equitable pluralism by advocating the interests of the disenfranchised (Davidoff, 2003 cited in Healey, 2005).

As has been explained earlier, the ASM workers feel disgruntled from their exclusion from employment by the LSM companies. Award of concessions to LSM activities are also without the involvement of the community members who are directly affected by the mining operations. The ASM workers thus take solace in illegal mining activities as a source of livelihood. The prescription by the theorists for the inclusion of all stakeholders in mining activities is required to curtail the negative effects associated with ASM activities.

### *Communicative Theory*

The communicative theory began with the recognition that the society is diverse with complex webs of economic and social relations within which men develop potentially very varied ways of seeing the world, of identifying interests and values, of reasoning about them, and of thinking about our relations. The theorists maintain that there is a potential for overt conflict in the society emanating from the differences in values and interests in people's attempt to meet their needs. The communicative theory evolved from the arena of environmental medication.

Societal challenge of getting people to agree about complex environmental conflicts has led to an interest in developing discursive forms or argumentations which encourage participants to contribute to developing a strategy to minimising the societal conflicts (Forester, 1992 cited in Healey, 2005). Like the advocacy theory, the participatory communicative strategies

are aimed at striking a balance among economic, social and environmental objectives. Owing to the fact that economic and social development had been addressed adequately in development discourses in the 1950s to the 1970s, the communicative theory emphasised environmental sustainability and is thus centred on the work of spatial planners (Healey, 2005).

The communicative theorists argue that the participatory communicative strategies are to bring on board all stakeholders to dialogue on ways to meet competing interests including the poor for dialogue.

Following the prescriptions of the communicative theorists, the competing interests in the ASM host communities must be addressed using the participatory approaches to forestall exclusion which emanate from award of concessions and the subsequent exclusion of the labour force in the mining communities.

### **3.4 Conceptual Framework on the Relationship between ASM and Livelihoods**

The conceptual framework as indicated in Figure 3.3 looks at the relationships between ASM and sustainable livelihoods. The conceptual framework is informed by the DFID's sustainable livelihood framework. The fundamental premise of this framework is underpinned by the practical consequences of ASM activities in mining communities and how the activities change people's livelihoods by creating capabilities that enable them cope with risks and shocks that may otherwise render them vulnerable. As much as the discussions and presentations on ASM issues have been negative, there have been several benefits that have been documented. The basic realisation is that the effects of ASM activities affect individuals of communities in a multi-sectoral manner in both positive and negative ways. From a livelihood's perspective, ASM affects all the assets or dimensions considered as fundamental for the survival of people in mining communities either by making them to be able to cope, reduce or manage risks and shocks or render them more vulnerable.

It is identified that the fundamental factors that affect the survival of man to cope, reduce or manage risks and shocks can be categorised into five, namely; natural, social, economic, human and physical capital. These issues are explained below:

- Natural capital comprise the natural resource stocks (soil, water, air, genetic resources, etc.) and environmental services (hydrological cycle, pollution sinks, etc.) from which resource flows and services useful for livelihoods are derived.
- Economic or financial capital consist of the capital base (cash, credit/debt, savings, and other economic assets, including basic infrastructure and production equipment and technologies) which are essential for the pursuit of any livelihood strategy.
- Human capital is the skills, knowledge, ability to labour and good health and physical capability considered important for the successful pursuit of different livelihood strategies.
- Social capital is the social resources (networks, social claims, social relations, affiliations, associations) upon which people draw when pursuing different livelihood strategies requiring co-ordinated actions; and
- Physical capital comprises the basic infrastructure and producer goods needed to support livelihoods. Thus the physical capital refers to the changes that occur to the physical environment as a result of investments into tangible and non-tangible facilities and services that help people to meet their basic needs and undertake productive activities effectively and efficiently. Physical capital from this perspective embodies affordable, adequate and secure transportation, adequate water supply and sanitation, and clean, affordable energy.

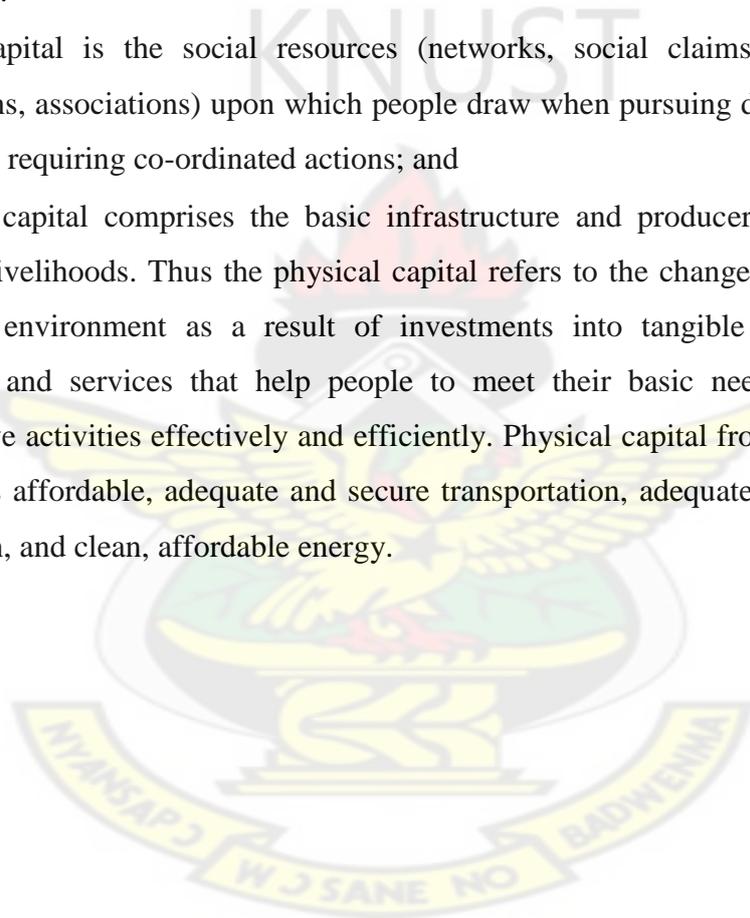
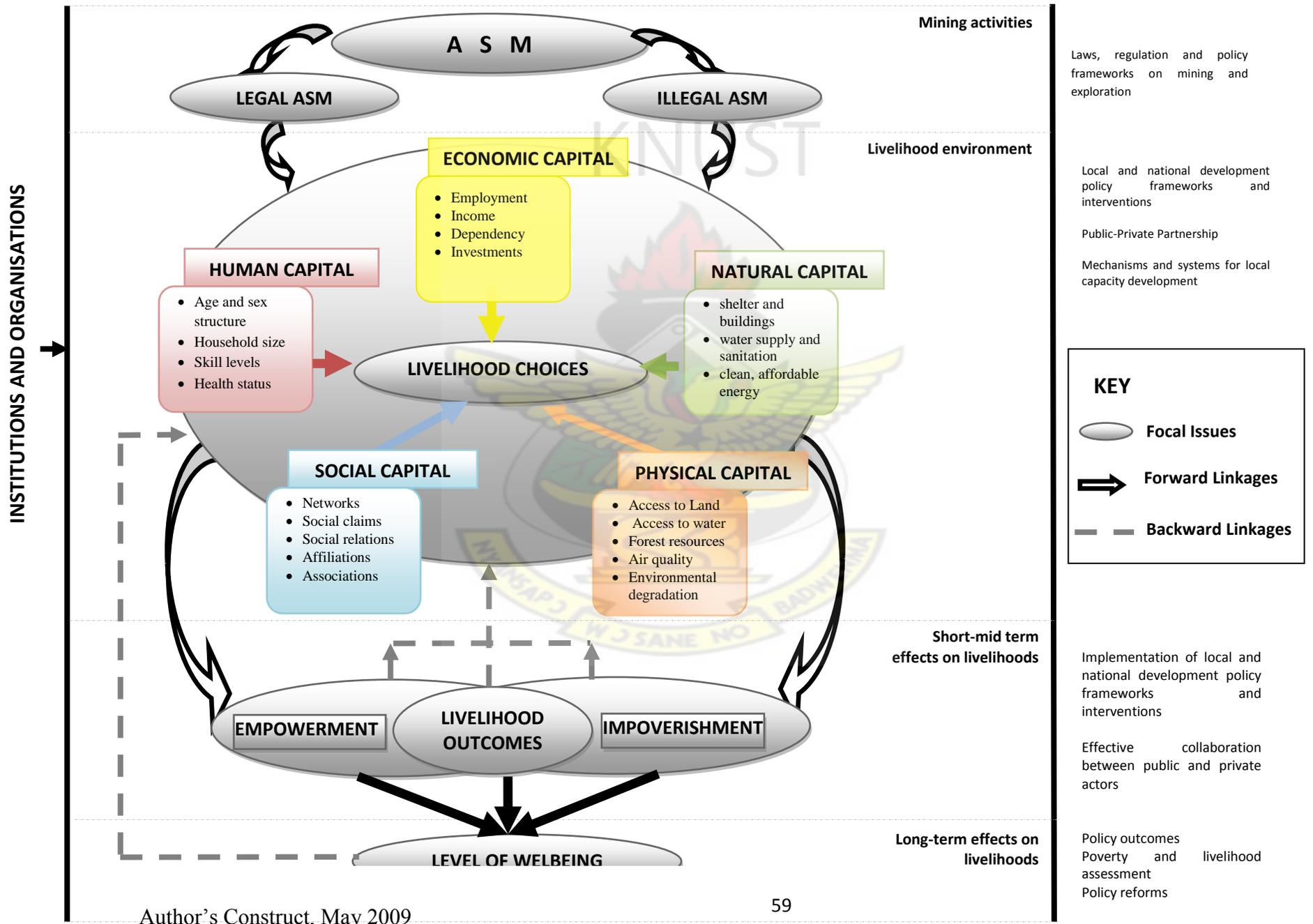


Figure 3.3. The Relationship between ASM and Sustainable Livelihoods



For all these capitals, through the institutional systems and processes, formal and informal rules will guide system actors' interactions to play critical roles by influencing how effective these factors interact with the consequences of ASM activities. This will optimise the potential of the activities and reduce the risks associated with it to induce human development and poverty reduction as indicated in Figure 3.3. Institutions involve a range of areas such as normative structures, culture, legal frameworks, policies and trends. Government policies, regulation, laws and local plans play important roles in guiding the activities of ASM in communities and influencing how each capital is utilised to enhance livelihoods.

Again, effective public-private-partnership (PPP) and an active civil society front provide the needed institutional foundation to influence how ASM activities affect the livelihoods of mining communities to promote empowerment, sustainability or impoverishment. The critical convergence of these factors is that they determine the sources of livelihoods of people and how they manifest in their lives. Choices as to how to improve wellbeing therefore are determined by the livelihood environment where the nature of livelihoods in mining communities becomes evident. Thus human, social, physical, natural and economic capital define the nature of livelihoods as well as determines the choices people make about how to cope, reduce, and manage risks and shocks in mining communities as shown in Figure 3.3 .

#### 3.4.1 ASM Activities and their Short Term Effects on Livelihoods

Generally, the framework articulates that ASM activities exist as either legal or illegal activities and they affect livelihoods in two different ways: negatively in terms of deteriorating the capabilities, assets (including both tangible and intangible resources) and activities required for a means of living; and positively by providing avenues and conditions that facilitate the creation of capabilities, assets (including both tangible and intangible resources) and activities required for a means of living (see Figure 3.3) The short term effects of ASM on livelihoods are normally experienced in the early seasons of the activities where indigenous and traditional technical abilities are highly prominent with little or no capital investments in the activity.

From the negative perspective, ASM poses immense risks to indigenous communities and the natural ecosystems with which they are closely related. These include but are hardly limited

to risks to culture, loss of territory, exposure to introduced diseases, loss of traditional livelihoods, and loss of control to outsiders (IIED and WBCSD, 2003).

**Table 3.2. The Short Term Effects of ASM Activities on Livelihoods**

<b>Positive Effects</b>	<b>Negative Effects</b>
<p><i>Natural</i></p> <ul style="list-style-type: none"> <li>i. Adoption of effective natural resource management practices</li> </ul>	<p><i>Natural</i></p> <ul style="list-style-type: none"> <li>ii. Destruction of forest lands</li> <li>iii. Destruction of soils and plant species</li> <li>iv. Pollution of river bodies and underground water reserve</li> <li>v. Increase in illegal mining activities</li> </ul>
<p><i>Human</i></p> <ul style="list-style-type: none"> <li>i. Development of entrepreneurial skills</li> <li>ii. Training on sustainable livelihood programmes</li> </ul>	<p><i>Human</i></p> <ul style="list-style-type: none"> <li>i. Increased incidence of STDs</li> <li>ii. Increased food and water contamination</li> <li>iii. Increased respiratory diseases</li> <li>iv. Destruction of formal educational activities</li> </ul>
<p><i>Social</i></p> <ul style="list-style-type: none"> <li>i. Provision of socio-economic infrastructure</li> <li>ii. Capacity training for Traditional Authorities</li> <li>iii. Provision of local governance infrastructure; e.g. Information centres</li> <li>iv. Increased networks; CBOs and civil society activities</li> </ul>	<p><i>Social</i></p> <ul style="list-style-type: none"> <li>i. Destruction of basic infrastructure such as roads, water supplies, houses, etc</li> <li>ii. Loss of civil and human rights</li> <li>iii. Destruction of traditional local governance systems</li> <li>iv. Adaptation to new cultural traits and systems</li> <li>v. Increased domestic conflict on ownership of resources</li> <li>vi. Loss of social networks as a result of relocation</li> </ul>
<p><i>Economic</i></p> <ul style="list-style-type: none"> <li>i. Increased access to credits</li> <li>ii. Provision of employment opportunities</li> <li>iii. Creation and growth of productive activities (SMEs)</li> </ul>	<p><i>Economic</i></p> <ul style="list-style-type: none"> <li>i. Landlessness (Loss of farm lands )</li> <li>ii. Loss of crops and livestock</li> <li>iii. Unemployment</li> <li>iv. Loss of customers and raw material suppliers</li> </ul>

Source: Author's Construct, May 2009

Mostly, ASM and other mining activities have problematic consequences including disruption of traditional and indigenous cultures and economic activities, introduction of

sexually transmitted diseases, price increases for basic commodities, displacement or elimination of traditional livelihoods and pollution. They often have special significance for ethnic minority communities, including indigenous groups, and for gender relations (Bass and Dalal-Clayton, 2001).). How these manifest in the lives of the people depends on how institutional systems, processes and mechanism for promoting effective decision making and development influence the translation of potentials to benefits for the people in mining communities. Local and national development policy frameworks and interventions, the interplay between the public and private sector in service delivery, creation of jobs and expansion of economic potential and traditional mechanisms and systems for local capacity development all influence the short to mid-term effects of ASM on the livelihoods of mining communities. Some of the effects of mining in the short to mid-term are conceptualised in Table 3.2.

#### 3.4.2. ASM Activities and their Long Term Effects on Livelihoods

The framework (ref. Figure 3.3) also identifies two main impacts of ASM activities on communities in the long term as impoverishment and empowerment. The backward linkage in the framework illustrates that these manifestations as much as they originate from the livelihoods choices of people also manifest within the livelihood environment. This means that, impoverishment and empowerment can be assessed by assessing the state of human, social, economic, natural and physical capital of communities in relation to the choices made as indicated in Table 3.3. The issues of impoverishment originates from the findings that the lost of livelihood assets limits the capabilities of communities for making a living and managing risks– affecting all the livelihood assets or capital that facilitate this process.

This is the stage where the culmination of the short run effects; after resettlement programmes, compensation and relocation interventions have been instituted; and the impacts of mining activities are actually felt. This stage emerges as a result of the utilisation and management of the systems warranting compensation for asset loss, implementation of local and national development policy frameworks and interventions on mining, institutionalization of effective collaboration between public and private actors and the adoption of effective and reliable Community Based Management Systems (CBMS). Yet all these would only have positive consequences depending on the quality of the institutional and organizational frameworks. For instance, it has often been documented that the institutional and organisational conditions providing compensation on asset loss do not in any way correspond

to actual loss and sustenance of livelihoods. Downing (2002) identifies that compensation by itself cannot adequately restore and improve the income levels and livelihood standards of people subjected to expropriation and forced displacement.

Prominent among mining activities in Ghana is the increasing engagement in ASM. Rich vegetation has been cleared and ridges have been targeted and mined from top downwards through a series of benches. The degradation of large areas of land by the ASM constitutes a major threat to agriculture in the communities and consequently the economic wellbeing of the people in those communities. The increasing illegal ASM and the fast growing destruction of the vegetation illustrate the weakness of the institutional systems for controlling ASM.

However, the reverse is true if the capacity of institutions to deal with ASM is enhanced. Thus institutional and organizational conditions for translating potential to benefits in a way are imperative for managing and reducing risks and/or promoting livelihood enhancement. On the other hand, ASM activities in the long run results in consequential positive impacts and this has been captured as “Empowerment” in the framework. Empowerment means that people or communities do not diminish but rather improve their livelihoods and enhance their cultures. The outcomes of the long term effects are conceptualised under “Empowerment” in Table 3.3.

**Table 3.3. The Long Term Effect of Mining on Livelihoods**

<b>Empowerment</b>	<b>Impoverishment</b>
<i>Natural</i> <ul style="list-style-type: none"> <li>• Re-forestation</li> <li>• Reclamation of closed mines</li> </ul>	<i>Natural</i> <ul style="list-style-type: none"> <li>• Dead fauna and flora</li> <li>• Polluted water bodies</li> </ul>
<i>Human</i> <ul style="list-style-type: none"> <li>• Increased accessibility to basic services</li> <li>• Improved health status</li> </ul>	<i>Human</i> <ul style="list-style-type: none"> <li>• Poor access to social services</li> <li>• Poor health status</li> </ul>
<i>Social</i> <ul style="list-style-type: none"> <li>• Reduction in vulnerability</li> <li>• Reduction in exclusion</li> <li>• Increased advocacy</li> <li>• Increased investment from royalties</li> <li>• Improved demand for local investment by mining companies</li> </ul>	<i>Social</i> <ul style="list-style-type: none"> <li>• Increased vulnerability</li> <li>• Increased exclusion</li> <li>• Insecurity</li> <li>• Loss of community identity</li> </ul>
<i>Economic</i> <ul style="list-style-type: none"> <li>• Improved income levels</li> <li>• Increased production and productivity</li> <li>• Satisfaction of basic needs</li> </ul>	<i>Economic</i> <ul style="list-style-type: none"> <li>• Low income levels for indigenous economic activities dependent on land</li> <li>• Low production</li> <li>• High cost of living</li> </ul>

Source: Author’s Construct May 2009

### 3.4.3 Livelihood Outcomes and Level of Wellbeing

All these consequences would result in inducing impoverishment and enhancing empowerment defined in terms of poverty and sustainability and therefore suggests whether livelihood choices and actions have been effective, responsive and sustainable. This would therefore be evident in the reduction or escalation of poverty which can be observed in the dimensions of society from the social, economic, natural, and physical perspective as depicted in the backward linkages. These may include increase in income levels, increased production, improved food security and health status, reduced vulnerability, more sustainable use of natural resources and enhanced capacity to manage risks and shocks or the negative state of these variables or measurements. Similarly at this level, institutional and organizational issues play critical roles in the management of ASM activities after critical livelihood choices have been made. Most evident at this stage are issues relating to policy outcomes, findings from poverty and livelihood assessment and the review of policy reforms for ensuring sustainability (Akabzaa and Darimani, 2001). Community institutional structures and organization are transformed in ways that may support or hinder livelihood activities of the people. This will affect the level of wellbeing.

### 3.4.4 Implications for Policy Intervention and Action

Based on the consequential impact of ASM activities, two response measures are imperative. The first builds on the benefits that accrue as a result of ASM activities. This has been identified as “measures of enhancement”. The underpinning rationale connotes the interventions to build the capacity of SMEs, to optimise social investment by mining investors as well as promote policy measures that fundamentally aim at sustaining benefits from ASM activities as well as optimising the potentials that are associated with ASM activities while minimizing risks and shocks. It includes reviewing policy and regulations to build the capacity of ASM to be more environmentally friendly and economically efficient.

In the area of impoverishment, it is identified that the negativity associated with ASM activities needs to be eradicated or reduced. To this, policy measures are to aim at providing interventions that would remove issues that reduce the capabilities and assets of making a living and providing mechanisms that facilitate the creation of new capabilities and assets for making a living. Extensive development of knowledge and scientific research show that rehabilitation and restoration of livelihoods is more likely when all potential impoverishment risks are identified early and arrangements are made to mitigate or avoid them. LSMs can

help by developing the capacities of ASMs and subletting part of their operations to them in a way to reduce illegality and promote efficiency. Legalising ASM therefore would encourage the initiation of livelihood programmes to mitigate the negativities of ASM activities through Sustainable Livelihood Programmes.

The critical awareness should therefore be to appreciate the importance of translating interventions to benefits and reduction in impoverishments. In terms of research, all these key issues must be integrated in the definition of variables so as to effectively capture the dynamics and intricacies of sustainable livelihoods in mining communities. This framework therefore provides an analytical and programming mechanism for promoting sustainable development through the understanding of the impact of ASM activities on the livelihoods of communities. This approach is strong in its comprehensiveness in identifying the short term and long term effects of ASM activities in a multi-sectoral manner warranting interventions to consolidate or enhance livelihood systems and their outcomes from a similar perspective. This has been summarised in Figure 3.3.

### **3.5 Analytical Framework**

In establishing concrete relationship among various key issues within this study, an analytical framework was devised to aid in a meaningful analysis that would help draw pragmatic policy measures to support sustainable sources of livelihood in mining communities in the Tarkwa-Nsuaem Municipality (see Figure 3.4). The analytical framework was teased out from the various livelihood frameworks reviewed in literature as well as the conceptual framework presented earlier in chapter four.

#### **3.5.1 Administrative/Legal Framework**

This section of the framework sought the understanding of whether there was a legal framework that articulates people's engagement in all forms of artisanal small scale mining activities in all the identified mining communities and whether they meet the various requirements. The study established the activities and safety equipment that small scale mine operators are required to provide and use for their operations. In addition, the study assessed whether specific regulations that govern the goals of the people within the identified mining communities and whether there is a legislative mandate that restricts activities that are detrimental to the sustainable livelihood of the individuals involved in the ASM mining process or live in mining communities.

Secondly, the capacity of various ASM groups was assessed based on the logistical, human resource and financial abilities to support these operations. This is in response to the fact that before any mining group can perform efficiently, effectively and sustainably, certain conditions must be prevailing within that working environment. At this stage therefore, a capacity assessment was undertaken to establish the capacity of these various ASM groups to meet procedural requirements for sustainable mining claims. Data analysed was based on responses from workers within the selected ASM groups within the Tarkwa-Nsuaem Municipality.

### 3.5.2 Socio-Economic Framework

This section of the analysis established whether there are practices and principles to be adhered to by these ASM groups. Through visits to the mining sites and observation, the study established whether mine operators were adhering to the procedural requirements for the protection of the environment and livelihoods. This is in line with the objective to assess the extent to which these mining groups do contribute to the sustainable livelihood of their workers, the host communities, the municipality within which the activity is being carried out as well as the country's development as a whole.

### 3.5.3 Diagnostic Framework

This is to relate variables to outcomes. This involved the combination of information on two or more variables in order to describe the problem or to arrive at possible explanations and conclusion. It is at this stage that causative factors of the challenges facing sustainable livelihoods in the mining communities were identified. This was influenced mostly by the outcomes of the descriptive and exploratory analysis from the Administrative/Legal and Socio-Economic frameworks. Consequently, the implication and conclusion were derived from this analysis which formed the basis for policy recommendations.

## 3.6 Summary and Lessons Learned

The chapter has revealed that ASM is the component of the mining sector which operates with minimum number of labour on small concessions usually not more than 25 acres and is dominated by the use of rudimentary technology. It is difficult to estimate the population of ASM in the world due to reasons such as the informal nature of the sector, the number of seasonal and occasional workers and the definitional issues. Despite the lack of official statistics on their number, the consensus is that, ASM is spread across the world and their

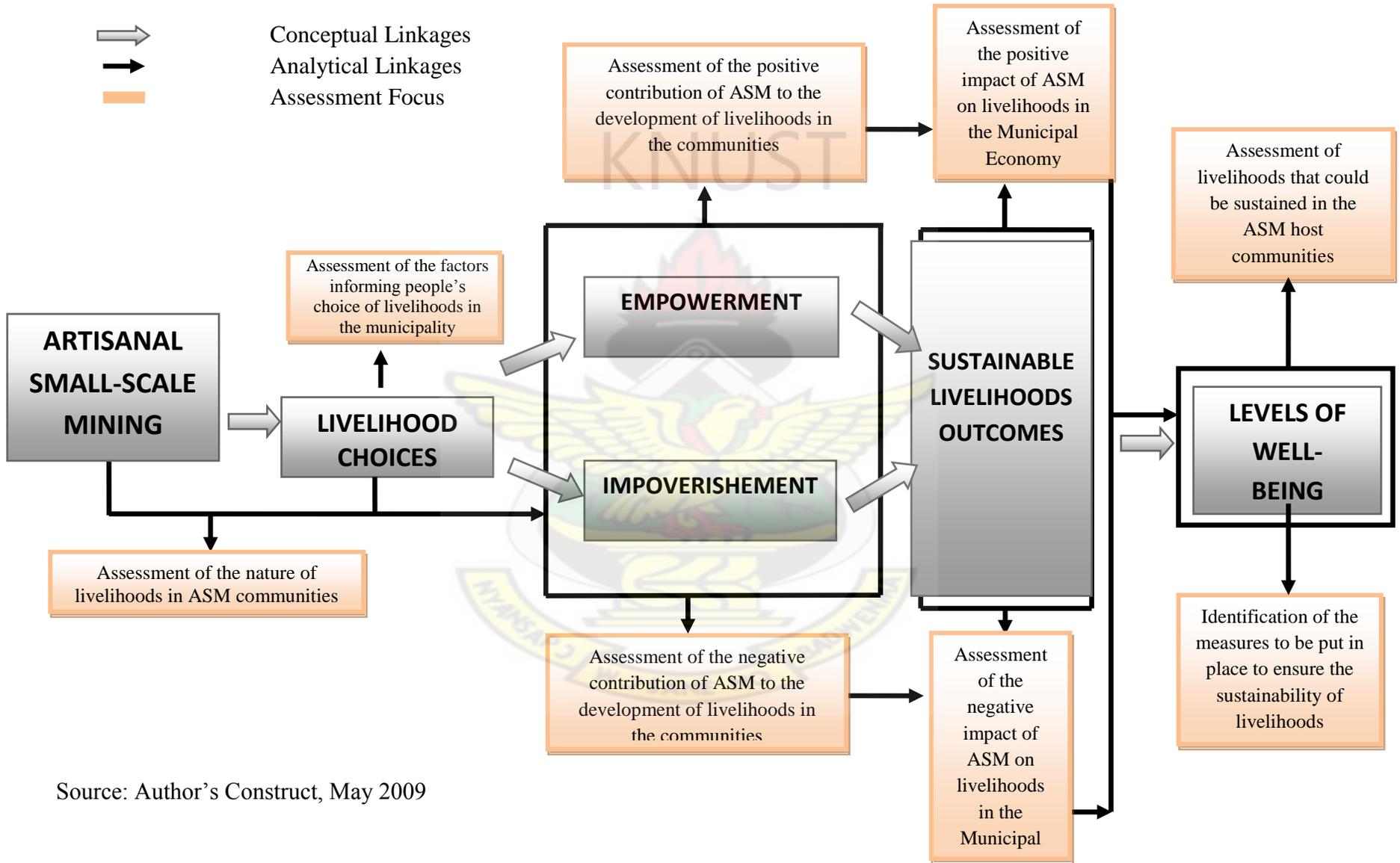
activities are paramount and visible in the developing countries of Africa, Asia and the Pacific. The sector has thus been a source of livelihood to families, groups and organisations in Ghana during the periods before and after colonisation.

Just as the LSM, the ASM companies extract minerals such as gold, diamond, bauxite, iron ore, marble, limestone and garnets from the deposits. Due to the use of rudimentary techniques of mineral extraction, the sector has been a major source of concern in discussions on environmental sustainability. The sector is known to have caused severe environmental problems such as air, water and noise pollution through the release of cyanide and mercury into the environment, and loss of forest cover caused by the sector's failure to reclaim the lands used (Akabzaa, 2004; Akabzaa, et al, 2007). Various attempts made by the Government of Ghana, Development Partners and research institutions to minimise the sector's environmental effects have yielded marginal gains.

Moreover, the sectors importance as a livelihood source to many people is unsustainable not only because of the finite nature of the minerals on which the activity depends but also the low productivity of the technologies employed in the mineral extraction. The nature of the ASM operations also affects the human and natural assets that are paramount determinants of livelihood. The health status of the miners is put to a high risk due to the lack of protection and insurance. Agricultural land uses are also affected by not only the ASM but also LSM as explained in the preceding chapter.

Sustainable development of the mine host communities is contingent upon the development of livelihoods that are sustainable. This is the key to preventing people from relapsing into the previous poor situation with the closure of mines. What is emerging from the analysis in this chapter is how the ASM can render the economic gains from their operations sustainable.

**Figure 3.4. The Analytical Framework for this Research and its Relationship with the Conceptual Framework**



Source: Author's Construct, May 2009

## **CHAPTER FOUR**

### **RESEARCH DESIGN AND METHODOLOGY**

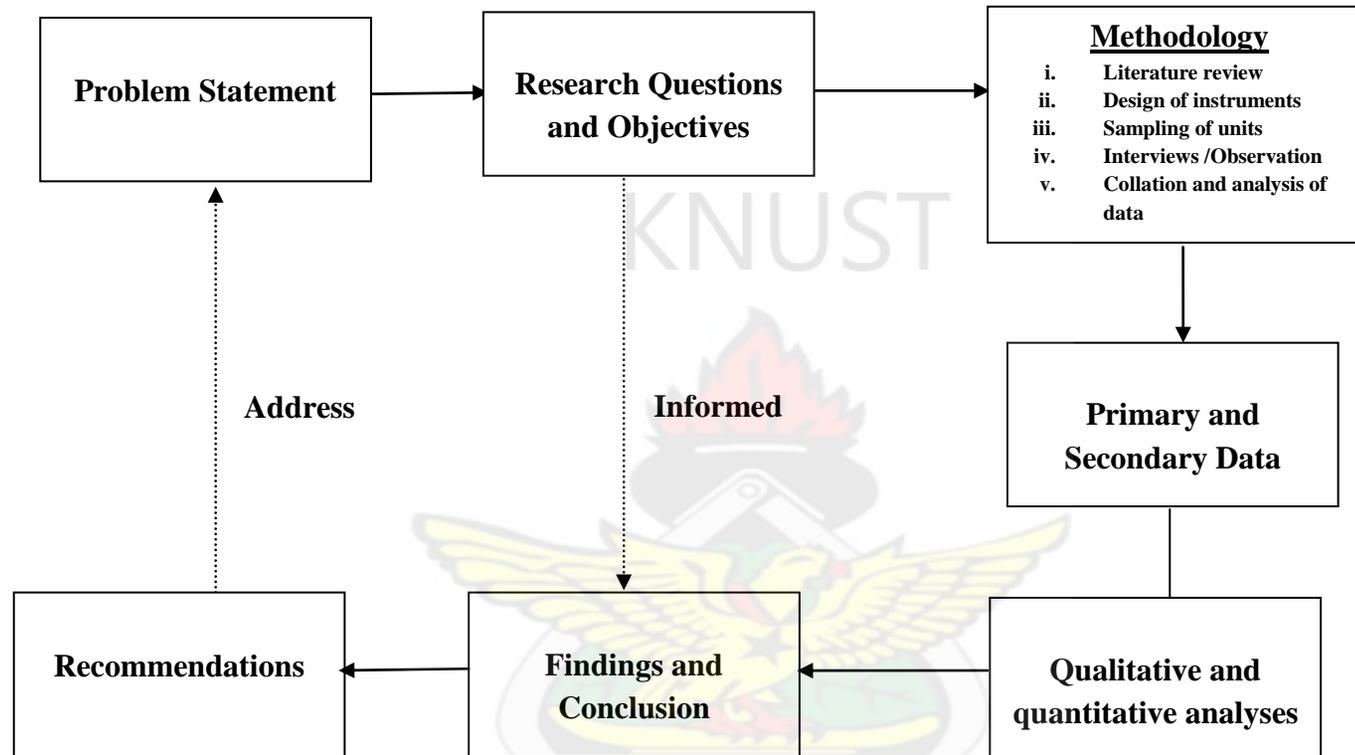
This chapter focuses on the general research design and the methodological framework of the study. It includes a choice of research design, variables studied, units of analysis, choice of areas of the research and data collection instruments. The chapter also details out the methodology used for the determination of the sample size from the sampling frame and the sampling techniques used to select the required respondents for the study.

#### **4.1 Research Design**

According to Yin (2009: 26), every type of empirical research has an implicit if not explicit research design. Basically, the design is the logical sequence that connects the empirical data to the study's initial research questions and ultimately, to its conclusions. A research design mainly comprises the outline of the various stages involved in the research exercise and serves more or less as a plan that guides the investigator in the process of collecting, analysing and interpreting observations. In this way, it becomes a logical model of proof that permits the researcher to draw inference concerning causal relations among the variables under investigation (Agbesinyale, 2003). In a similar vein, Yin (2009) also indicates that colloquially, a research design is a logical plan for getting from here to there, where here may be defined as the initial set of questions to be answered and there as the set of conclusions or answers about these questions. Yin (2009) however cautions that a research design is more than a work plan and that the main purpose of the design is to help to avoid the situation in which the evidence does not address the initial research questions. In this sense, a research design deals with a logical problem and not a logistical problem.

The research design may therefore be defined as the logical sequence that connects all the components of a research; whereas the components are defined to include the problem statement, research questions and objectives, research methodology, conclusion and recommendations. The logical sequence in the research design is to forestall the lack of connectivity among the various components that often emerge out of improper planning of the research. The research design is conceptualised in Figure 4.1.

**Figure 4.1. Research Design**



Source: Author's Construct, July, 2009

Figure 4.1 indicates that the research process commenced with an identified problem that needs to be carefully and systematically investigated. The investigation process was guided by a series of research questions and objectives. The research questions/objectives determined the scope of the research which the assessment of the investigation's outcome was based upon. The required answers to the research questions were obtained through the application of a systematic empirical strategy from review of relevant literature to the collection and analysis of primary data. The outputs of the process were primary and secondary data. The secondary data were obtained through review of literature on the subject under investigation. This was intended to develop the research's conceptual and theoretical framework. The secondary data analysis also revealed the emerging issues on the subject under investigation which was addressed with primary data. The primary data was obtained from the units of analysis through interviews and observations. As indicated in Figure 4.1, the outputs were qualitative and quantitative data which were analysed with the use of quantitative and qualitative techniques. The merit for using both the quantitative and qualitative approaches in data analysis is that the weaknesses of one will be compensated for by the strengths of the other (Bryman, 2008 cited in Alatinga and Fielmua, 2011).

Figure 4.1 explains that the conclusion/findings of the investigation were linked to the research questions/objectives. Owing to the fact that the data collection instruments were designed based on the research questions/objectives, the analysis and presentation of the findings should automatically address the research questions/objectives. The recommendations thereafter should be aimed at addressing the problem that informed the investigations. This is the logic in the research design.

#### 4.1.1 Choice of Case Study Approach and Justification

The case study method was used in this research. It is one of several ways of doing social science research (Yin, 2009). According to Berg (2007), the case study method is defined and understood in various ways. Some sources define the case study method as an attempt to systematically investigate an event or a set of related events with the specific aim of describing and explaining this phenomenon. To Bell (2004), a case study research design is appropriate for studies that require in-depth information about a phenomenon within a limited period where a large scale survey may not produce the true results. Kumekpor (2002) opines that a case study

research design provides useful insights which would not have been gained if the research's geographical scope was large. These definitions suggest that a case study is an approach capable of examining simple or complex phenomenon with units of analysis varying from single individuals to large corporations and businesses. It entails using a variety of lines of action in its data gathering segments and can meaningfully make use of and contribute to the application of the theory (Yin, 2003 cited in Berg, 2007).

Again, a case study is typically described as a programme or intervention put in place to address a particular problem. Yin (2009) defines case study research as an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context especially when the boundaries between phenomenon and context are not clearly evident. Case study provides the opportunity for an intensive analysis of many specific details that are often overlooked. It is useful for studying an individual, group, an episode, a process, a community, a society or any other units of social life (Theordorson and Theordorson, 1969 cited in Yeboah, 2008). In the view of Shuttleworth (2008), the advantage of the case study research design is that it can focus on specific and interesting cases and it provides the investigator with more realistic responses. To Kumekpor (2002) therefore, it is a critical and systematic examination into the circumstances and factors that result in a particular condition, situation, occurrence or event. Premised on these arguments, the case study research design was adopted for this study. The identified characteristics of the research approach would help in understanding comprehensively the dimensions and manifestation of the relationships existing between ASM and sustainable livelihoods in mining areas in Ghana particularly the Tarkwa-Nsuaem Municipality. Alternatively, the case study research design was used to examine the prospects of introducing sustainable sources of livelihood in the Tarkwa-Nsuaem Municipality.

In addition to the above, both the exploratory and descriptive approaches of research study were adopted. Exploratory study refers to a small-scale study of relatively short duration, which is carried out when little is known about a situation or a problem. It may include description as well as comparison (Varkevisser et. al. 2003). Comparison is fundamental for this research as this strategy would help to identify the gaps between what is and what ought to be the sustainable sources of livelihood among people in mining communities in Ghana most especially in the Tarkwa- Nsuaem Municipality. Descriptive study on the other hand offered a platform where the

various sustainable sources of livelihoods can be well articulated. This involved describing the characteristics of a particular situation, event or case (Varkevisser et. al. 2003). Information was obtained from households, groups and individuals in the selected communities. Key informants from both public and private institutions were also consulted. Focus group discussions were also organised.

The study area was chosen for various reasons. The Tarkwa-Nsuaem Municipality was carved out of the Wassa West district which is known for its rich mineral endowment such as gold, manganese and diamond. Mining activities, particularly gold mining has been carried out in the area for centuries. The gold mining activities include both large and small-scale mining. Some of the large scale mining companies are Goldfields Ghana Limited and Anglo Gold Ashanti, Iduapriem. There are many ASMs throughout the municipality. These factors informed the choice of the municipality as a case study.

#### **4.2 Key Variables of the Research and Unit of Analysis**

According to Frankfort-Nachmias and Nachmias (1996), a variable is an empirical property which can take on two or more values or forms in a research activity. Thus, if a property can change either in quality or quantity, it can be termed as a variable in a research. Using variables as key elements of a research problem helps to move the research from conceptual level to empirical level (Kumekpor, 2002). Based on these, the study's variables were:

- Household and miners' characteristics (i.e. ages, sex, educational levels and skills, marital status, duration of stay in the municipality)
- Household heads and miners' livelihood sources and income levels
- The nature of ASM activities in the municipality
- Effects of ASM in the municipality

These variables are explained in detail in Table 4.1. The specific indicators under each variable as well as their relevance to the objectives of the research are also indicated in Table 4.1.

**Table 4.1. Research Variables, Nature and Purpose**

<b>Variable</b>	<b>Nature and Measures of Variables</b>	<b>Purpose</b>	<b>Methods of Data Collection</b>
Characteristics of miners and households	Analysed using respondents' age, sex, educational level, skills, marital status and duration of stay in the municipality.	To understand the nature of natural assets in the mine host communities and more importantly, the categories of persons engaged in ASM. Analysis of respondents' characteristics will facilitate internal validation with information from multiple respondents and external validity through triangulation of responses.	Interviews using semi-structured questionnaires and interviews guides administered through one-on-one interviews and FGD respectively.
Sources of livelihoods of miners and household heads and turnovers (income levels)	The sources of livelihood in the mining host communities were identified. The income levels of the economic actors were used as turnover from the identified sources of livelihood.	This facilitated the assessment of the sustainability prospects of the various livelihood sources. The analysis of respondents' incomes helped to identify the major determinants of livelihood choice in the mining host communities in the municipality.	Interviews using semi-structured questionnaires and interview guides administered through one-on-one interviews and FGD respectively.
Nature of ASM in the Municipality	Analysed in terms of the number of ASM registered, the size of concessions and how they are obtained and the nature of technologies used in mineral exploitation. The production chain from mining to sale was also analysed under the nature of ASM.	This facilitated the validation of the research findings in line with the findings of earlier researches on the nature of ASM.	Interviews using semi-structured questionnaires and interviews guides administered through one-on-one interviews and FGD respectively.
Effects of ASM	Analysed with the concept of sustainable development as the premise. The indicators used were social, economic and environmental.	The effects of ASM on the environment, the economic and social fabric of the municipality helped to ascertain the sector's sustainability prospects. The linkage effects on the other livelihood sources in the mining host communities informed the research's recommendations.	Interviews using semi-structured questionnaires and interviews guides administered through one-on-one interviews and FGD respectively.  Unobtrusive observation was also applied.

Source: Author's construct, 2009

#### 4.2.1 Units of Analysis

The unit of analysis of a research is the empirical units, objects and occurrences which must be observed or measured in order to study a particular phenomenon (Kumekpor, 2002). Frankfort-Nachmias and Nachmias (1996) add that unit of analysis is the most elementary part of a phenomenon being studied. Mikkelson (1993 cited in Agbesinyale, 2003) defines and itemises units of analysis as: individuals or groups, whole programmes or their components, organisations, critical incidents and time periods.

According to Agbesinyale (2003), this clearly shows that units of analysis whether they are one or more in a case study setting depend on the scope and the complexity of the research questions and the core research issues one is trying to address. In the same way, the unit of analysis also helped to determine the most appropriate case study design to be used. Based on these definitions, the units of analysis for this study were licensed small-scale mining companies, unlicensed small-scale mining companies, households in the mine host communities, and the Mineral Commission. The others were Tarkwa-Nsuaem Municipal Assembly, Municipal Health Service (MHS), traditional authorities, financial institutions and all the relevant agencies indicated in Table 4.4.

### **4.3 Sampling Procedure**

Bailey (1982) maintains that a survey of any kind requires resources, time and organisation that may be very expensive and may be beyond the means of the researcher concerned. Samples can, however, help the researcher draw precise conclusions representative of all the units. He further argues that by concentrating resources on only a part of the population (sample) the quality of the data will be superior to and guaranteed than that of a complete enumeration. In view of this, a part of the population was carefully selected for the study.

#### 4.3.1 Sampling Frame and Sample Size

The sampling frames for the study were the populations of households and ASM in the mining host communities. The research obtained a total of 15 licensed ASM from the Mineral Commission based upon which four were selected for the study. The numerical strength of the unlicensed ASM could not be determined. Underpinned by the lack of a master list of the

unlicensed ASM in the municipality, the researcher selected the number by intuition. Four licensed ASM and two unlicensed were selected for the study as indicated in Table 4.2. The four licensed ASM were randomly selected while the two unlicensed ASM were selected using the snowball sampling technique. The snowball sampling technique was operationalised by identifying the ASM for interview after which the firm (interviewee) helped to identify the next mining firm. In the case of the licensed ASMs, they were selected with the assistance of a master list obtained from the Minerals Commission. As already indicated it was difficult to get information from the small scale miners and physical access to some of the sites was difficult and appeared dangerous. A total number of 110 workers (80 from the four licensed ASM companies and 30 from the two unlicensed companies) were covered.

**Table 4.2. Selected Artisanal and Small Scale Mining Companies/ Groups**

<b>Licensed Small Scale Mining Companies</b>	<b>Unlicensed Small Scale Mining Groups</b>
Nana Yefri Mining Group	Akoon Small Scale Group
Mohammed and Co.	Asamankaraba Small scale Group
Dakate Company Limited	
Johnson and Co Mining Project	

Source: Field Survey, September, 2009.

Two processing companies namely; Akoon Processing Group and Essuman Processing Company at Tarkwa and Nsuaem respectively were studied. The study also covered two licensed Gold Buying Companies, namely E. Yeboah Enterprise and Campari Gold Buying Agency. The owners or managers of the companies were interviewed in addition to the FGD held with the employees. The multiple sources of data from the companies (i.e. from the employers and employees) helped in the triangulation of the responses.

Regarding the number of households that was selected for the study, the study used the population  $n = \frac{N}{1+N}$  of households in each of the six Town/ Area Councils in the Municipality as the basis for the determination of the sample size (refer to Table 4.3). A total of 400 households were selected for the interview. The sample size was determined at a 95 percent significant level from a population of 23,316 households across the six Area Councils (Tarkwa-Nsuaem

Municipal Assembly, 2009). The formula for the determination of the sample size was adopted from Miller and Brewer (2003) as indicated below:

$n = N / 1 + N (\alpha^2)$ , where  $n$  is the sample size (i.e. number of households to be covered and  $N$  is the sampling frame (i.e. the total number of households in the study area)

The sample size was thus determined as follows:

$$n = 23,316 / 1 + 23,316 (0.05^2)$$

$$n = 393.25.$$

The sample size derived from the application of the formula was 393 households. This figure was approximated to 400. The sample size of 400 households was then distributed among the six Town/Area Councils as indicated in Table 4.3. The simple proportion method was used to allocate the 400 households among the 22 communities which had experienced mining operations from ASM.

The selection of the households from the communities was systematic, and operationalised by first numbering the houses in the communities and dividing by the sample size allocated for the area. The housing stock per community was used instead of the households because of ease of identifying the housing stock using the existing house numbers. Where there were no house numbers, the study enumerated the houses to identify the housing stock. In view of the fact that multiple households lived in the houses (i.e. the compound nature of the houses), the study selected only one household from any selected house for the interview. The first household the study identified was interviewed. Household heads were interviewed though information about other household members was sought.

**Table 4.3. Households Selected in the Study Communities**

Area Council (A/C)	Total Population in A/C	Total Number of Households in A/C	Name of Selected Communities	Total Number of Households	Housing stock	Households Selected
Tarkwa	31,968	6,579	Tarkwa	1,974	1,289	30
			Tarkwa Atuabo	987	541	15
			Essaman Kakraba	526	77	8
			Abontuako	982	434	15
			Efuanta	658	130	10
			Nkwamproase	461	96	7
			Kwabedu	991	186	15
Nsuta	15,984	2,656	Akyempim	797	121	15
			Nsuta	1,328	449	25
			Bankyim	1,062	213	20
Benso	19,181	3,522	Benso	1,467	285	25
			Esikuma Bonsawire	881	122	15
			Esuaaso	1,174	317	20
Nsuaem	19,190	3,469	Mile 5	578	133	10
			Esuogya	1,563	74	20
			Nsuaem,	1,734	610	30
Pepesa East	19,189	1,853	Dompim	1,413	504	26
			Agona	978	161	18
			Bonsa	869	143	16
Pepesa West	19,145	5,237	Simpa	2,968	479	34
			Simpa Dadwen	1,746	76	20
			Simpa Nkwanta	524	9	6
<b>Total</b>						<b>400</b>

Additionally, 19 institutions, agencies and organisations were purposively selected for interview and 27 questionnaires were administered. They were purposively selected because they were key institutions in the sustainability of livelihoods in the Municipality. The institutions are indicated in Table 4.4.

**Table 4.4. Institutions/Organisations Selected for the Study**

<b>Institutions</b>	<b>Number of Questionnaires Administered</b>
Tarkwa-Nsuaem Municipal Assembly	3
Municipal Health Service	1
Hospitals in the Municipality	2
Minerals' Commission	1
Municipal Police Headquarters	1
Non Governmental Organisations	1
Environmental Protection Agency	1
Large Scale Mining Company (Goldfields)	1
Ghana Education Service (GES) -Tarkwa	1
Ghana Water Company	1
Ministry of Food and Agric. (Municipal office)	1
Forestry Department	1
University of Mines and Technology	1
Lands Commission	1
GPRTU	1
Metro-mass Transport Company	1
Labour Office	1
Precious Minerals Marketing Corporation	1
Financial Institutions <sup>3</sup>	3
	3
<b>Total</b>	<b>27</b>

*Source: Field Survey, September, 2009.*

The key informants in the institutions were the heads. For example the Municipal Chief Executive was interviewed at the Tarkwa-Nsuaem Municipal Assembly while the Municipal Director and heads were interviewed at the Municipal Education Office and Environmental Protection Agency and Minerals Commission respectively.

The survey was preceded with pilot testing of the instruments in the Municipality. As part of the pre-testing, the study was to observe the time taken to administer each questionnaire, the responsiveness of participants and any difficulty experienced in understanding and interpreting the questions in the instruments. The essence of carrying out the second pre-testing was to ensure that all the necessary minor corrections were done prior to data collection.

<sup>3</sup> Ahantaman Rural Bank, Fiaseman Rural Bank and First National Bank.

#### 4.4 Sources of Data and Methods of Data Collection

The study used both secondary and primary data to provide the required responses to the research questions. The sources of the secondary data included both published and unpublished reports and articles on the subject under investigation. These secondary sources provided the meaning and relevance of concepts embodied in the topic. They provided the justification for the need for a more sustainable source of livelihood for inhabitants in ASM communities towards sustainable poverty reduction in Ghana. The conceptual issues that were derived from the secondary sources of data included the meaning of livelihood, livelihood strategies and sustainable livelihood framework, effects of mining on the local and national economy and sustainable poverty reduction. The others were the social and environmental consequences of mining. Data from the secondary sources were from three levels viz. the local, national and international levels. Table 4.5 provides the details of the target sources of secondary data collected.

**Table 4.5. Sources of Secondary Data**

Level	Sources
Local Level	Local surveys by NGOs, statistics issued at the local level by local institutions (e.g. Municipal Assembly, Forestry Department, Department of Food and Agriculture, Municipal Directorate of Education, Municipal Directorate of Health, Minerals Commission, PMMC, Environment Protection Agency, Municipal Statistical Service and the Municipal office of the Ghana Water Company).
National Level	National policy documents, Legislations and Acts, archival records, parliamentary collections, articles from journals, books and publications at universities and other national libraries, research by NGOs, CBOs and donor partners at the case areas, News papers, etc
International	Information from bilateral and multi-lateral organisations such as UNDP, World Bank, the British Geological Survey.

Source: Field Survey, October 2010.

The primary data were gathered through the observations and interviews that were carefully granted with respondents using semi-structured questionnaires and interview guides. The semi-structured questionnaires were administered with household heads while the interview guides were administered with mining workers, their employers and the heads of the institutions. The

data were obtained from the licensed mining companies, unlicensed mining companies; ASM workers, traditional authorities, and households. The other sources of primary data were the Tarkwa-Nsuaem Municipal Assembly, District Health Service, Minerals Commission, Environmental Protection Agency, Lands Commission and Ghana Education Service (refer to Table 4.4).

Structured questionnaires were used to elicit the required information through interviews with the owners or managers of the firms numbering six, ASM workers and 19 institutions. Interview guides were also used to elicit the required responses through Focus Group Discussion (FGD) with the traditional authorities and groups of ASM workers. The researcher's direct observation was also used as one of the means of collecting primary data. The primary data enabled the researcher to determine the impact of ASMs on the sustainability of livelihoods in the Municipality.

#### **4.5. Methods of Data Analysis**

According to Gerring (2007), traditionally, the case study approach has been associated with qualitative methods of analysis. Gerring (2007) however argues that to study a single case intensively, a case study research may be either quantitative or qualitative or some combination of both. In line with this, the data collected from secondary and primary sources were both quantitative and qualitative. The analysis of the quantitative data began with a collation using the Statistical Programme for Social Sciences (SPSS) version 16. The collated data were used to generate statistics in the form of arithmetic means, frequency distribution tables, statistical charts (bar graphs, line graphs and pie charts) which were interpreted. The policy implications of the statistics generated by SPSS version 16 were made by the researcher after carefully studying the data and identifying trends and patterns. The content analytical approach was used to analyse the qualitative data. It involved making comprehensive statements and analytical descriptions about the policy meanings of statements that were made by the household heads, miners and institutions interviewed.

**CHAPTER FIVE**  
**PROFILE OF THE WESTERN REGION AND THE TARKWA-NSUAEM**  
**MUNICIPALITY**

After a thorough investigation of the theoretical framework of the study in the preliminary chapters, the purpose of this chapter is to narrow the discussion down using data from the case examples of various mining-related institutions to test and investigate if the theoretical issues discussed in the preceding chapter hold particularly at the local level in Ghana. In undertaking this activity, basic data that summarize the profile of the Western Region and the case study municipality – Tarkwa-Nsuaem Municipality and an overview of the various selected institutions was assembled to ensure evaluative discussion of the research results. This was done to give a general view of the spatial and socio-economic characteristics of the case study area within which data were collected for the study.

**5.1. Profile of the Western Region**

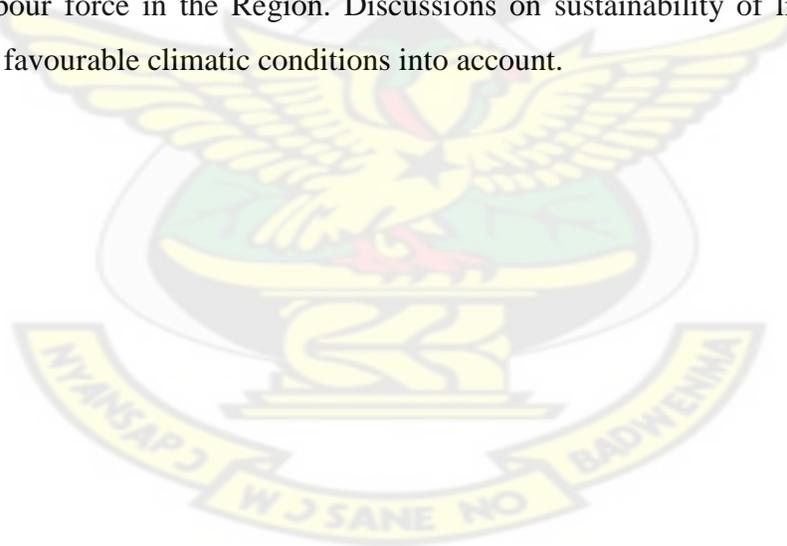
This section provides a brief profile of the Western region of Ghana. The profile of the Western region provides the study's audience the relative location of the Tarkwa-Nsuaem municipality. The profile of the Tarkwa-Nsuaem municipality will then be the absolute location of the study area. The main issues covered in the profile of the Western region are; the physical characteristics of the region, demographic and economic characteristics as well as other issues that have direct bearing on livelihood in the region and the study area.

**5.1.1 Physical Characteristics of the Western Region**

The Western Region covers an area of approximately 23,931 square kilometres, constituting about 10 percent of the total land area of Ghana. As indicated in Figure 5.1, the region is bordered to the east by Central Region, to the north by Brong Ahafo and Ashanti Regions, to the south by the Gulf of Guinea and to the west by La Cote d'Ivoire. The southernmost part of Ghana can be located in the region, at Cape Three Points (Ghana Statistical Service, 2005). The Region has a total number of 17 Metropolitan, Municipal and District Assemblies (MMDAs) comprising; one metropolis, three municipalities and 13 districts as presented in Figure 5.1.

The Region lies in the equatorial climatic zone which is characterised by moderate temperatures, ranging from 22°C at nightfall to 34°C during the day. It is the wettest part of Ghana, with a double maxima rainfall pattern averaging 1,600 millimetres per annum. The two rainfall seasons which fall between May-July and September/October, support rain-fed agriculture. The high rainfall regime gives rise to high relative humidity, ranging from 70 to 90 percent in most parts of the region.

The Western Region has approximately 75 percent of its vegetation within the high forest zone of Ghana. The south-western part of the region is noted for its rain forest, interspersed with patches of mangrove forest along the coast and coastal wetlands, while a large expanse of high tropical forest and semi-deciduous forest is also found in the northern part of the region. The Western Region has 24 forest reserves, which account for about 40 percent of the forest reserves in the country. Prominent among them are the Bia Reserve, Cape Three Points National Park, and the Ankasa/Nini Suhyien Forest and Game Reserve. The climatic conditions favour agriculture which is the major source of livelihood in the region. Agriculture employs about 58 percent of the labour force in the Region. Discussions on sustainability of livelihoods should therefore take the favourable climatic conditions into account.





### 5.1.2. Demographic Characteristics

The Western Region had a total population of 1, 924,577 in 2000 (GSS, 2005). The inter-censal population growth rate of the region had fallen from 3.2 percent for 1984-2000 to 1.8 percent for 2000-2010. This was lower than the national annual growth rate of 2.4 percent for 2000-2010. There were five major indigenous ethnic groups namely; Ahanta - 6.3 percent; Nzemas -10.6 percent; Wassa -11.7 percent; Sefwis -10.9 percent; and Aowins - 2.5 percent.

According to the Ghana Statistical Service (2005), the 2000 Population and Housing Census revealed that 36.3 percent of the Western region's population lived in urban areas in 2000 having increased from 24 percent in 1960. This increase could be attributed partly to a steady drift of rural migrants to urban areas and partly to the growth of previously rural communities into urban communities due to natural increase in population. However, the region remained largely rural in spite of the increased urbanisation. Out of a total number of 8,933 communities in the region, only 500 (6 percent) had populations of more than 5,000. The age structure of the region was not different from that of the developing world which has a broad base that tapers off with increasing age. According to the 2000 Population and Housing Census the proportion of persons younger than 15 years was 42.4 percent while that of those who are above 64 years was 4.5 percent. The region had a population density of 81 persons per square kilometre which was the sixth highest in the country. In terms of sex ratio, females constituted 49.2 percent of the region's population. The sex ratio was therefore 103.4 males to 100 females. This could be attributed to the high level of male migration to the region in search of jobs in the mining and agricultural sectors.

### 5.1.3 Economic Characteristics

The Western Region is endowed with many natural resources. It is one of the most economically active regions in the country. The region is the largest producer of cocoa, rubber and coconut, and one of the major producers of oil palm. It also has rich tropical forests with different species of timber and wildlife. The Region is also the largest producer of raw sawn and processed timber and wood products. It has a wide variety of minerals, including gold, bauxite, iron, diamonds and manganese. The region is the second largest producer of gold, the sole producer of bauxite and has deposits of iron ore, limestone and salt. Mining in the region is gradually affecting agricultural land uses through depletion of the forest cover as evident in Plate 5.1

### Plate 5.1. Effects of Mining on the Forest Cover



Source: Ali, (2009; *unpublished*).

The region occupies the richest part of Ghana and its soils are also supportive of Ghana's major cash and food crops. The largest deposits of gas and crude oil are found in the region. The Western Region is therefore a very important contributor to national income and development. The Western Region is a major contributor to Ghana's GDP. The Region produces 100 percent of Ghana's rubber, 75 percent of Ghana's coconut, 55 percent of Ghana's cocoa, and 35 percent of oil palm. It is also the second largest producer of gold, the sole producer of bauxite and has deposits of iron ore, manganese, limestone and salt. Despite its rich resource endowment and contribution to Ghana's GDP, the state of infrastructure in the region is poor and the level of development is low. Livelihood opportunities seem to be benefiting the migrants than the indigenes. The enormous economic potential of the region provides the basis for the assertion that the region holds the key to Ghana's eventual economic breakthrough if the region's economic potential is properly harnessed and managed effectively (Ghana Statistical Service, 2005). The Region emerged as one of the most favoured regions for migrants because of its economic endowment (Ghana Statistical Service, 2005).

In spite of its economic potentials, the development of economic infrastructure in the region is poor. The road network from the mineral rich areas and cocoa and food crop producing areas in the region is very poor. As a result, food crops are usually locked up in the interior of the region. This situation has also increased the cost of transportation in the region in terms of distance, travel time and in money. This situation has been compounded with the collapse of the railway

system that linked most of the mineral and food producing centres to the regional capital and the port.

### *Employment*

Agriculture, industry and services were the major economic activities in the Western Region as of the year 2000. Agriculture (including fishing, animal husbandry and hunting) engaged 58.1 percent of the population of the Region while 14.5 percent were engaged in production and transportation. Trading engaged 10.2 percent while 5.4 percent of the population were engaged in professional and technical works. Of those within the legally permissible working age group (15 years and above), self-employed persons constituted majority (72.9 percent) of the economically active population; 68.3 percent had no employees working for them. It is estimated that about 1 percent of the total land area of the Western Region is under mining.

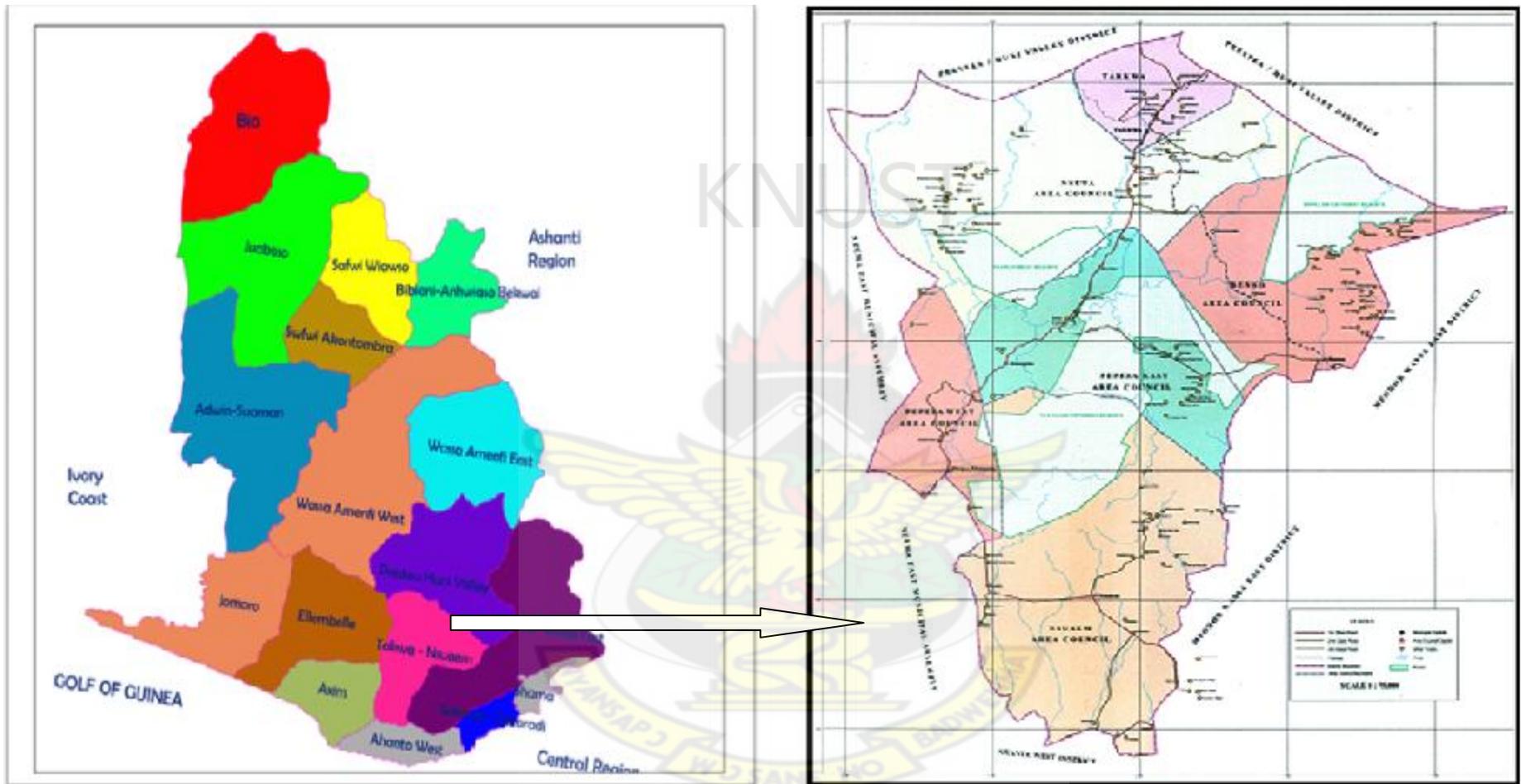
#### 5.1.4 Social Characteristics.

There were 410,412 households in the region in 2000 with an average household size of 4.7. Male-headed households accounted for about 72 percent of the total number of households in the region. Only 32 percent of houses had access to treated pipe-borne water with 8.5 percent having the facility within their houses. Most households (over 60 percent) used natural sources such as rivers and streams. The main source of cooking fuel in the region was wood. There were 1,320 primary schools, 694 junior high schools and 42 senior secondary schools, 1 polytechnic and 1 university in the region (Ghana Statistical Service, 2005). The region was the seventh on the national poverty ladder with 18 percent of the population earning below the national poverty line of GH¢90 per person per annum (Government of Ghana, 2003).

## **5.2 Brief Profile of the Tarkwa-Nsuaem Municipality**

The Tarkwa-Nsuaem municipality is one of the 17 administrative MMDAs in the Western Region of Ghana as indicated in Figure 5.2. It shares boundaries with Prestea Huni-Valley District to the north, Nzema East District to the west, Ahanta West District to the south and Mpohor -Wassa East District to the east (Figure 5.2). The Municipality has a total land area of 978.26 sq. km. It has five Area Councils and one Urban Council. They are; Benso, Simpa, Nsuta, Dompim, Nsuaem Area Councils and Tarkwa Urban Council as indicated in Figure 5.3.

Figure 5.2. Tarkwa-Nsuaem Municipality in the Regional Context



Source: Tarkwa-Nsuaem Municipal MTDP, 2010

### 5.2.1 Climate and Vegetation

The Tarkwa-Nsuaem Municipality lies within the South-western equatorial climatic region where relative humidity is generally high throughout the year. Relative humidity in the municipality is between 70 and 80 percent in the dry season and 75 and 80 percent in the wet season. It has a mean annual rainfall of 187.83cm with a double maxima rainfall. The high precipitation experienced in the Municipality supports plant growth. Rain water is the main source of water for agricultural activities which takes place throughout the year. In terms of vegetation, the Municipality falls within the rainforest belt. It has about 440.15 km<sup>2</sup> of forest reserves. The main forest reserves in the municipality are; the Bonsa Reserves, Ekumfi Reserve and Neung North and South Reserves. Table 5.1 shows the location and size of the forest reserves in the Tarkwa-Nsuaem municipality.

**Table 5.1. Location and Size of Forest Reserves in the Tarkwa-Nsuaem Municipality**

<b>Reserves</b>	<b>Location</b>	<b>Areas (Sq. Km)</b>
Bonsa River Forest Reserve	Bonsa	209.79
Neung South Forest Reserve	Nsuaem	112.99
Neung North Forest Reserve	Agona	44.85
Ekumfi Forest Reserve	Simpa	72.52
<b>Total</b>		<b>440.15</b>

Source: Tarkwa-Nsuaem Municipal Assembly's MTDP, 2010

Most of the virgin forest in the municipality has been reduced to secondary forest through increased human activities such as excessive open cast mining, farming and indiscriminate lumbering. The rapid increase in these human activities is gradually reducing the economic and medicinal value of the vegetation and this has consequences for livelihood sustainability in the municipality.

### 5.2.2 Geology, Soil and Drainage

The municipality is located within the forest dissected plateau region of Ghana. The land rises from about 240 meters to about 300 meters above sea level. The area is generally undulating with few scarps ranging between 150 meters to 300 meters above sea level. The geological formations in the Municipality are mostly the Birimain and Tarkwaian formations. Economically, the Birimain rocks are regarded as the most important formation due to their

mineral potentials. These minerals include gold and manganese. This has given rise to many small and large scale mining activities in the municipality.

The soil type is mainly Oxysols. This soil type supports extensive cultivation of cassava, maize, plantain, rubber, cocoa and oil palm among others. The Bonsa River and its numerous tributaries such as; Buri, Anoni, Sumin and Ayiasu are some of the major rivers in the municipality.

### 5.2.3 Demographic Characteristics

The Tarkwa-Nsuaem Municipality had a total projected population of 107,712 for the year 2009 and a population growth rate of 3.0. There are more males than females in the municipality with 50.8 percent of the total population being males while 49.2 percent are females (Tarkwa-Nsuaem Municipal Assembly's MTDP, 2010). The male dominance in the municipality could be attributed to the higher number of males who migrate to the municipality in search of jobs in both ASM and LSM companies in the municipality.

#### *Major Economic Activities and Sources of Employment in the Municipality*

Agriculture is the major economic activity in the municipality. Other economic activities are industry and commerce. About 68 percent of the economically active population are engaged in the agricultural sector whilst the remaining 32 percent are engaged in the area of commerce and industry.

Agricultural activities are mainly on subsistence level. According to the Municipal office of MoFA, the average farm size is 2.5 acres. The main crops cultivated in the Municipality are cassava, plantain, cocoa and oil palm. There are seven commercial banks, five financial institutions and about five rural banks located in the various communities in the Municipality. The commercial banks include, Standard Chartered Bank, Barclays Bank, Ghana Commercial Bank, SSB Bank, Ecobank, Inter-continental Bank and Stanbic Bank. There are other non-bank institutions such as; Social Security and National Insurance Trust, State Insurance Corporation, Metropolitan Insurance Company, Gold Coast Securities and Consumer Credit limited.

The highest income earners in the Municipality are mine workers and those in construction and consultancy firms in the Municipality. According to the Municipal Labour Officer, many

mining and mine related industries employ a lot of people in the municipality. Notable among them is Goldfields Ghana Limited which employed 2,488 people in 2011. Some of the mine related or auxiliary companies are; Liebherr, Allterrain Services, BANLAW, Group Five, AEL, G 4 Security and OTR Tyres. Most of these companies employ skilled personnel such as; heavy and light duty mechanics, welders, auto mobile technicians, heavy equipment and machine operators and people with skills in financial administration and management. According to the Traditional Council, majority of the people employed by the LSMs and the mine related or auxiliary companies are not natives of the municipality since most of the natives lack the requisite skills.

People in the agricultural sector are the least income earners in the Municipality earning GH¢2,400 per annum on the average. According to the Municipal Plant Protection Officer, the labour force in the agricultural sector in the municipality has been decreasing due to the fact that people find ASM more lucrative. Farms and farmlands have also been destroyed by mining activities. Chemicals such as mercury and cyanide used by miners also destroy crops and farmlands. People in the mining sector on the other hand are the highest income earners in the municipality. The average income earned per annum in the mining sector is GH¢ 9600 (Tarkwa-Nsuaem Municipal Assembly's MTDP, 2010).

### **5.3 Socio-economic Infrastructure Available in the Municipality**

This section of the chapter looks at the main socio-economic infrastructure in the municipality that have direct impact on the sustainability of livelihoods. These are in the areas of education, health, water and sanitation, markets and roads.

#### **5.3.1 Education**

Both the state and the private sector are involved in the provision of formal education in the municipality. According to the Municipal office of the Ghana Education Service, the Tarkwa-Nsuaem Municipality has a total of 56 public kindergartens, 59 primary schools and 42 junior high schools (JHS) at the basic education level. It also has 3 public senior high schools (SHS), one vocational school and one public university. Private schools in the municipality comprise of 36 kindergartens, 34 primary schools and 21 JHSs, 1 Private senior high school and 1 private vocational school.

### *Drop-out rate*

The dropout rate for the primary school level was 0.26 percent for the academic years 2009/10 and 2010/11. According to the Municipal Office of the Ghana Education Service the drop-out rate was 0.71 percent in 2009/10 and 1.10 percent in 2010/11 at the JHS level. There was a slight increase in the drop-out rate at the JHS level in the 2010/11 academic year. Generally, the drop-out rate at the basic level of education in the municipality is low. This is contrary to the perception that mining contributes greatly to high drop-out rate in mining communities in the country. According to the Municipal office of the Ghana Education Service, mining activities, particularly galamsey has minimal effects on the dropout rates in the municipality. In their view, negative attitude of some parents towards the education of their wards such as the refusal to provide the basic educational needs of their wards have also contributed to the situation. The gross completion rate (GCR) for the primary level in the Municipality was 95.3 percent with a higher male population than females. This is attributed to teenage pregnancy. According to the Municipal Office of the Ghana Education Service, this situation is being addressed through community sensitisation and girls education week.

According to the Municipal Office of the Ghana Education Service, there is no contact between their office and any of the ASM groups in the municipality. Apart from the UMAT Basic School where school buildings developed cracks as a result of blasting by galamsey activities, there has been no confrontation between the schools and the ASM groups in the various communities. There is however a very good relationship between them and the LSM companies. Some of the LSM companies have contributed to the construction of educational infrastructure in the municipality. For instance, Goldfields Foundation Ghana built the new Municipal office of the Ghana Education Service near Aboso and has built 20 school blocks while Iduaprim has also built 10.

### 5.3.2 Health, Water and Sanitation

There are four hospitals, four health centres, eight rural clinics, 10 private maternity homes and 41 pharmacy and chemical shops in the municipality. In terms of water, there are 69 boreholes, 25 hand dug wells and two small water facilities in the municipality

### 5.3.3 Markets

There are six major marketing centres in the Tarkwa-Nsuaem Municipality. These are; the Tarkwa (Market circle) Market, New Atuabo, Agona, Nsuaem, Mile 5 and Mile 101/2 markets.

### 5.3.4 Roads

The total lengths of the various categories of roads in the Municipality are: trunk roads 80km, feeder roads 262.3km and town roads 38 km. As indicated in Table 5.2, the conditions of the roads in the municipality are generally poor.

**Table 5.2. Total Length and Types of Roads and their Conditions in the Municipality**

<b>Road Type</b>	<b>Total length of roads (km)</b>	<b>Percent</b>	<b>Good</b>	<b>Percent</b>	<b>Fair</b>	<b>Percent</b>	<b>Poor</b>	<b>Percent</b>
Highway	210.0	45.16	78.0	16.77	50.0	10.75	82.0	17.63
Feeder	255.4	54.92	137.3	29.53	8.5	1.83	109.6	23.57
<b>Total</b>	<b>465.0</b>	<b>100.00</b>	<b>215.3</b>	<b>46.30</b>	<b>58.5</b>	<b>12.58</b>	<b>191.6</b>	<b>41.20</b>

Source: Tarkwa-Nsuaem Municipal Assembly's MTDP 2010-2013.

### 5.4 Environmental Impact of Mining Activities in the Tarkwa -Nsuaem Municipality

Both LSM and ASM activities in the Municipality have negatively affected the natural environment. For instance, they have contributed to the degradation of the natural environment and the destruction of the ecosystem (Ali, 2010). The open cast method which is practised extensively and intensively has had devastating effects on the environment as illustrated in Plate 5.2. Through mining activities, hills have been graded down, vegetation covers of soils have been removed and deep pits have been created. Large tracks of land have been extensively degraded by the activities of large-scale mining companies, licensed small scale companies and illegal operations in most communities. Trees are extensively cut down and used as props in mine pits; they are also used as fuel wood to dry the ore and to build shelter on most of the ASM sites. The use of fuel wood and growth of settlements have also contributed to the environmental degradation experienced in the municipality.

Pollution of water bodies is also a major problem associated with mining activities in the municipality. Seepage of heavy metals into underground water is a potential hazard from mining to the natural environment. Some community water sources such as streams and rivers have been polluted. A typical example of such rivers is River Bediabewo at both Efuanta and Bakoakohu near Tarkwa. Plate 5.3 shows the extent of siltation and pollution of the Bediabewo River. This has resulted in various public health hazards in the Municipality. For instance, according to the Municipal Health Statistician, diarrhoea was the fifth most common outpatient disease (OPD) in the municipality in 2008 and 2009.

**Plate 5.2. Destroyed Vegetation Cover at Nkwadum near Nsuaem**



Source: Field Survey, July 2010

It was also the third most common cause of death in 2009. Dust pollution has led to the prevalence of diseases such as tuberculosis and skin irritation. For instance, acute respiratory infections were the second most common OPD disease in 2008 and 2009. Skin diseases and ulcers were the fourth most common OPD disease for the same period.

Another area of the destruction of the natural environment is the creation of numerous uncovered pits in mining communities in the municipality. The Wassa Fiase Traditional Council is concerned about the pits that are left uncovered after mining. They are of the view that both large and small scale mining companies are guilty of this offence. The Traditional

Council (TC) is of the view that it is the government's responsibility to ensure that these pits are covered before new concessions are given. The money deposited at the Chamber of Mines to be used to cover pits left behind by mining companies should be used for such a purpose in the area.

**Plate 5.3. Siltation and Pollution of River Bediabewo near Tarkwa**



Source: Field Survey, July 2010

According to the Municipal EPA Officer, there are many uncovered pits dotted all over the mining communities of the municipality. Some of these pits are partially covered by vegetation as shown in Plate 5.4 and this is dangerous to both human beings and animals. Environmental degradation is compounded by the activities of the ASMs particularly the unlicensed ones which operate at subsistence level to survive on daily basis and do not care about the long term effects of their activities on the environment. Even though both the municipal offices of the Minerals Commission and EPA carry out monitoring activities and also carry out educational programmes, they lack the capacity to effectively check the activities of the ASMs especially those in remote and inaccessible areas. The EPA for instance has only two permanent staff, a small office space and no laboratory.

**Plate 5.4. An Abandoned Mine Pit at Asamankakraba**



Source: Field Survey, July 2010

**5.5. Summary of the Profile**

From the profiles of both the Western Region and the Tarkwa-Nsuaem municipality, it can be said that both the region and the municipality are endowed with many natural resources and contribute greatly to the nation's GDP but have poor socio –economic infrastructure. This has direct impact on the sustainability of livelihoods in the municipality as well as the region. The Tarkwa-Nsuaem municipality is also endowed in natural resources such as suitable soils, climate and vegetation which if well managed and sustainably used could enhance the development of the municipality as well as provide sustainable source of livelihood for the inhabitants of the municipality. Information presented and analysed at the regional and municipal levels is expected to help the analysis of data in the subsequent chapters.

## **CHAPTER SIX**

### **THE NATURE OF LIVELIHOODS IN MINING COMMUNITIES IN THE TARKWA-NSUAEM MUNICIPALITY**

This chapter focuses on the livelihoods of people in selected mining communities of the Tarkwa-Nsuaem Municipality. The main objective is to understand the nature of livelihoods in mining communities in the Municipality. The study identified farming, civil/public service, artisanship, mining and trading as the sources of economic livelihoods in the mining communities employing 27 percent, 5 percent, 4.5 percent, 50.5 percent and 13 percent of the labour force respectively. Chapter two indicated that livelihood refers to people, their capabilities, means of living, and ownership and articulation of information that are vital for the effective utilisation of the assets they use to obtain a living. Premised on this, the analyses of the nature of livelihoods in the mining communities commence with the assessment of the human, social, physical and natural capital. The chapter then analyses the economic capital in the mining communities.

#### **6.1 Nature of Human Capital in the Mining Communities**

Human capital is the skills, knowledge and physical capability considered important for the successful pursuit of different livelihood strategies. The main aspects of human capital considered in this section of the study are; age, sex distribution and educational background of the household heads in the selected mining communities.

##### **6.1.1 Age and Sex Distribution of Respondents**

Household heads from the study communities were between the ages of 21 and 60 years across all the five Area Councils and one Urban Council in the Municipality. Majority of the household heads (i.e. 70 percent) were within the age group of 31-40 years as indicated in Table 6.1. The proportions mentioned are similar for all the Area and Urban Councils in the Municipality with Nsuaem Area Council recording the highest percentage (i.e. 85 percent) of household heads between the ages of 31-40 years. The dominance of the economically active age group in the mining communities provides an opportunity for the ASM which is primarily labour-intensive.

The analyses of the survey results revealed that 92.50 percent of the household heads were males with females constituting only 7.50 percent. The trend was similar for all the Area

Councils which is explained by the cultural practice of males being the heads of households in Ghana.

**Table 6.1. Age of Household Head by Area Councils.**

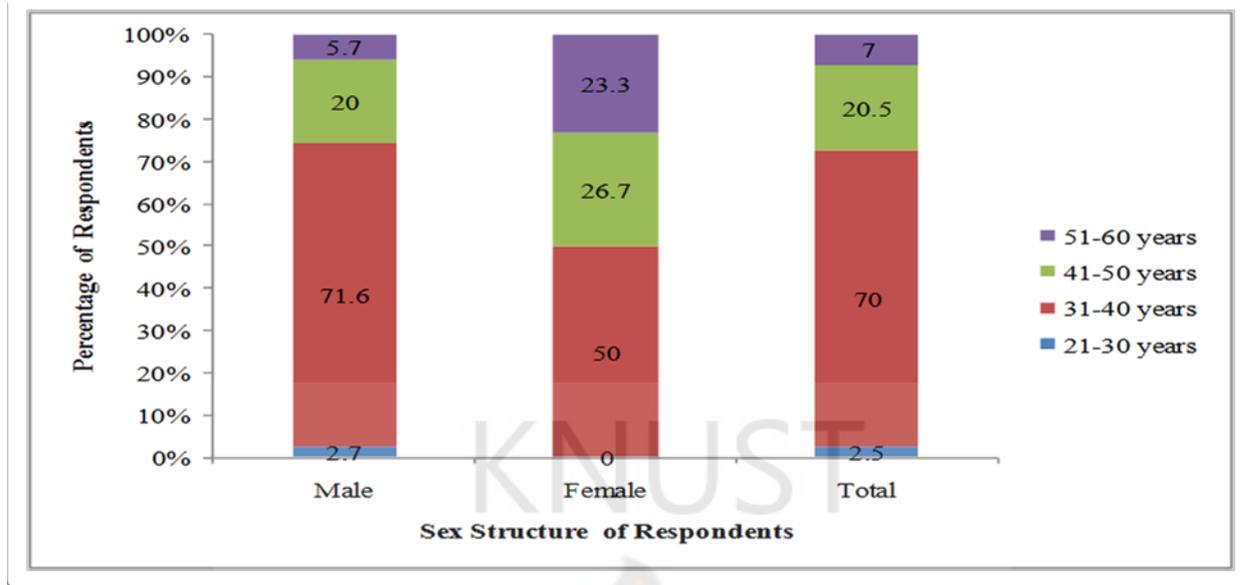
Age of Household Head		Area Councils					Total	
		Tarkwa Urban Council	Pepesa East Area Council	Nsuta Area Council	Nsuaem Area Council	Benso Area Council		Pepesa West Area Council
21-30	Number	0	1	0	4	3	2	10
	Percentage	0.00	0.25	0	1	0.75	0.5	2.5
31-40	Number	60	39	34	51	50	46	280
	Percentage	15.00	9.75	8.5	12.75	12.5	11.50	70.00
41-50	Number	23	20	15	5	7	12	82
	Percentage	5.75	5.00	3.75	1.25	1.75	3.00	20.50
51-60	Number	17	0	11	0	0	0	28
	Percentage	4.25	0.00	2.75	0.00	0.00	0.00	7.00
Total	Number	100	60	60	60	60	60	400
	Percentage	25.00	15.00	15.00	15.00	15.00	15.00	100.00

Source: Tarkwa-Nsuaem Field Survey August, 2010

According to the Ghana Statistical Service (2005; 35), for the past four decades (i.e. since 1960), census data have indicated that households have been headed predominantly by males in Ghana and this could be explained by socio-economic factors.

For the various age groupings, the study revealed that majority of male and female respondents fell within the 31-40 age cohort. Majority, (i.e. 71 percent) of the male respondents were between 31-40 years while 50 percent of the female respondents were within this age group. The dominance of the 31-40 years age-cohort is an evidence of the nature of ASM which is labour intensive and requires the economically-active age group. The findings tally well with Kabote and Niboye's (2013) observation that the Bulyanhulu Gold Fields in Tanzania where over 60 percent of the miners were aged 35-44 and 54. Nevertheless, the findings indicate that artisanal mining activities involved both young people as well as older ones. Interestingly more female respondents than male respondents were aged between 41-60 years as indicated in Figure 6.1.

**Figure 6.1. Ages of Respondents by Sex**



Source: Tarkwa-Nsuaem Field Survey, August 2010

#### 6.1.2 Educational Background of Household Heads

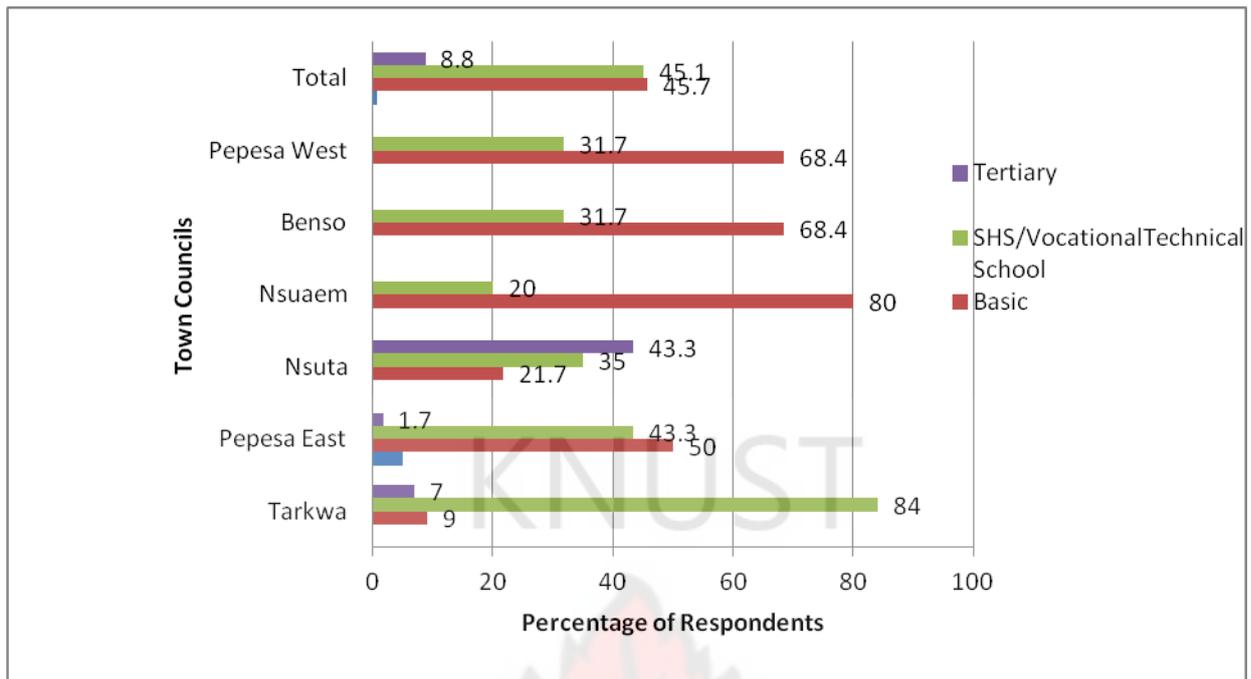
In terms of the educational level attained by the household heads, 99.92 percent of them have had some form of formal education. It emerged that 44 percent had completed basic school while 45.30 percent and 8.8 percent had completed secondary education and tertiary levels respectively as indicated in Figure 6.2. Only 0.08 percent had not had any form of formal education. Apart from Pepesa East Area Council which had 5.0 percent of the household heads with no formal education, all the household heads in the other Area Councils had some form of formal education.

In most rural areas in Ghana, the Ghana Statistical Service (2008) observes that low educational performance accounts for the low educational levels due to low transitional rates from one level to the other. The Ghana Statistical Service explains this phenomenon by asserting that household members are often made to work to supplement household income which usually leads to low performance and subsequently low educational attainments. The state of educational attainment of respondents in the various Area Councils is in line with the observation by the Ghana Statistical Service (2008). Evidently, majority of the respondents did not continue after their basic or secondary school education. Since educational capital is essential for the physical, economic and social development of the household, to some extent, these respondents had limited opportunities in reducing their present and future socio-

economic vulnerability, which is a significant factor in livelihood empowerment and sustainable poverty reduction. This normally has effects on labour productivity and local economic growth since the labour force would lack the innovative capacity to enhance the economy, and promote the adoption of new knowledge and technologies. This is believed to have direct impact on the types of livelihoods in the municipality especially in increasing the human capital inherent in the labour force of the community. This could therefore explain the reason for the high proportion of respondents in the agricultural and ASM sectors of the municipal economy.

Even though in the Municipality, there was a high level of literacy (i.e. 98.3 percent) among respondents, it was observed that few (8.8 percent) of the respondents had acquired the needed higher educational level of tertiary education that would enable them to be gainfully employed in the large scale mining sector as well as the formal sector in the municipality. Beside the needed high technically skilled labour that most of the respondents do not have by virtue of their education levels, they also lacked basic technical skills that could enable them get employment in lower levels of the occupational category in large scale mining companies and other formal sectors that require such skills. This is an issue of concern to the chiefs and other opinion leaders in the mining communities within the municipality. In a key informant interview with the traditional authorities, the Traditional Council (TC) led by the Paramount Chief (who has a doctorate degree) indicated that the Council receives a lot of complaints from Youth Associations in the Municipality about the fact that they do not gain employment in the available LSM. They have consequently recommended a quota system where locals or natives could be employed by the various large scale mining companies in the municipality. They were of the view that the natives should be given preference or should have advantage if they have the requisite skills. Owing to the low educational attainment and lack of basic skills required by the LSMs, it has been difficult to implement this recommendation by the Traditional Council. The paramount chief recounted an incident where he rejected gifts from some LSM companies because only four out of 100 people presented for employment were appointed. According to the Community Affairs office of Goldfields Ghana Limited, various efforts have been made to engage the local people through employment and the award of scholarships but little has been achieved.

**Figure 6.2. Educational Background of Respondents**



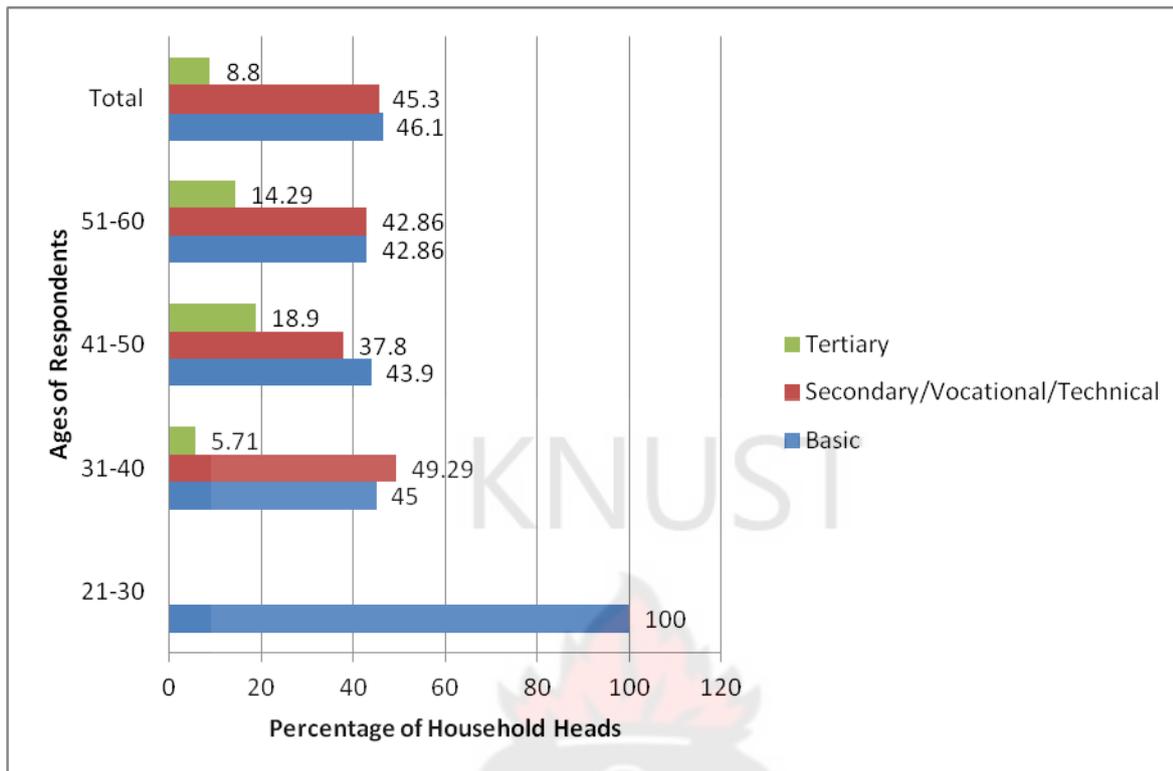
Source: Tarkwa-Nsuaem Field Survey, August 2010

The educational levels of the various age groups vary. All the respondents aged between 21-30 years, had attained basic school level of education. From Figure 6.2, it is evident that more than 50 percent of the household heads had attained educational levels higher than JHS/Middle school level. Similarly, the proportion of household heads with higher educational levels increases with increasing age. For instance, in Figure 6.3, more respondents had completed tertiary education in the 51-60 and 41-50 age cohorts than those between 21-30 and 31-40 age groups. This could be attributed to the fact that these young people who were the heads of their households had to sacrifice their education to work in order to take care of their households. It is therefore not surprising that majority (60 percent) of respondents in the studied ASMs are young people within this age group.

Additionally, it emerged from the analyses that female household heads had attained higher educational levels than their male counterparts. At least all females (100 percent) had some form of formal education whereas 0.81 percent of males had no formal education. However, 1.35 percent of males attained <sup>4</sup>primary school level education whereas the minimum educational level attained by female-headed households head was JHS/Middle school.

<sup>4</sup> Primary not used in the universal sense. It refers to up to grade six in the Ghanaian educational system.

**Figure 6.3. Educational Status of Household Heads by Age Distribution**



Source: Tarkwa-Nsuaem Field Survey, August, 2010

This trend is similar at the SHS/Vocational/Technical education level with male respondents recording 47.57 percent while females recorded 16.7 percent.

Despite the variation in educational level, the evidence from the field provides an enormous potential of livelihood enhancement through education. According to Eggert (2001), a depleting mineral resource can, in effect, be converted into a sustainable, renewable source of human wellbeing through appropriate investment in human capital such as education. With the high level of literacy, it is envisaged that training, demonstration and surveillance which are the key elements of any programme to improve occupational safety and health in ASM needs to be localised (Hentschel et. al., 2002), and it is after this that these interventions can be initiated successfully in the Municipality. Education and awareness of the small-scale miners and the population in general regarding environmental matters may become easier, and presents an asset for enhancing the livelihoods of members of the mining communities sustainably if their human capital is enhanced through skills training. The prescriptions embodied in the communicative theory could be relevant on maximising the benefits of associated with ASM while minimising the environmental ramifications.

In enhancing livelihoods, knowledge has become the key ingredient of the new production paradigm and an essential factor in the modernisation of production systems and the economic behaviour of individuals. The human capital theory for instance, espouses that the focus on education as a capital good relates to the concept of human capital which emphasises that the development of skills is an important factor in production activities (Olaniyan and Okemakinde, 2008). The reasons emanate from the understanding that education correlates positively with the socio-economic wellbeing of individuals, society and nations (Psacharopoulos and Patrinos, 2007). Without education, it is argued that the probability of one getting decent employment is daunting. This explains why about 75 percent of the economically active population in the municipality is in the informal sector where little or no education is required (Tarkwa-Nsuaem Medium-Term Development Plan, 2010).

Majority of the respondents (i.e. 99.92 percent) have had some form of education, but it is difficult for them to be engaged in the formal sector since they lack the requisite skills to be employed in this sector. In Australia for instance, where educational attainments are higher than that of developing countries, from the survey results of Hogan and Tedesco (2003), a relatively large proportion of mine sites (39 percent) “did not employ any indigenous people on a full time basis at the end of 2001-02. Similar trends exist in Africa, Ghana and the study municipality. Most often, these indigenes are employed as labourers or other low level ranks with corresponding low salaries in the formal sector. As a result of this, Temeng and Abew (2009) observed that in Ghana, this situation accounts for the significance of ASM activities on the livelihood of local inhabitants in the project area and the fact that large scale mining companies could not provide the needed direct employment to most of the local youth.

According to the Municipal Office of the Labour Department, the three main large scale mining companies in the municipality (viz. Goldfields Ghana Limited, AngloGold Ashanti (Iduaprem) and Golden Star (Wassa) Limited) employ only 6.87 percent (i.e. 4,140 people) of the labour force numbering about 60,290. The youth have consequently resorted to ASM.

In their effort to address the problem of limited skills of the youth, the Traditional Council decided to engage them in skills training programmes that they believed would help them make good use of other resources in the municipality. According to them, since the traditional area is endowed with bamboo, they decided to invest GH¢2,000 in the training of the youth in

bamboo furniture manufacturing. The youth however abandoned the project because they felt the turnover was relatively lower and slower. Meanwhile, from the interviews conducted at the various ASM sites and in the selected communities, the youth do not consider ASM as a sustainable source of livelihood. This therefore suggests the importance of sustainable livelihood strategies that inform the process of local level development in the municipality through effective human capital development.

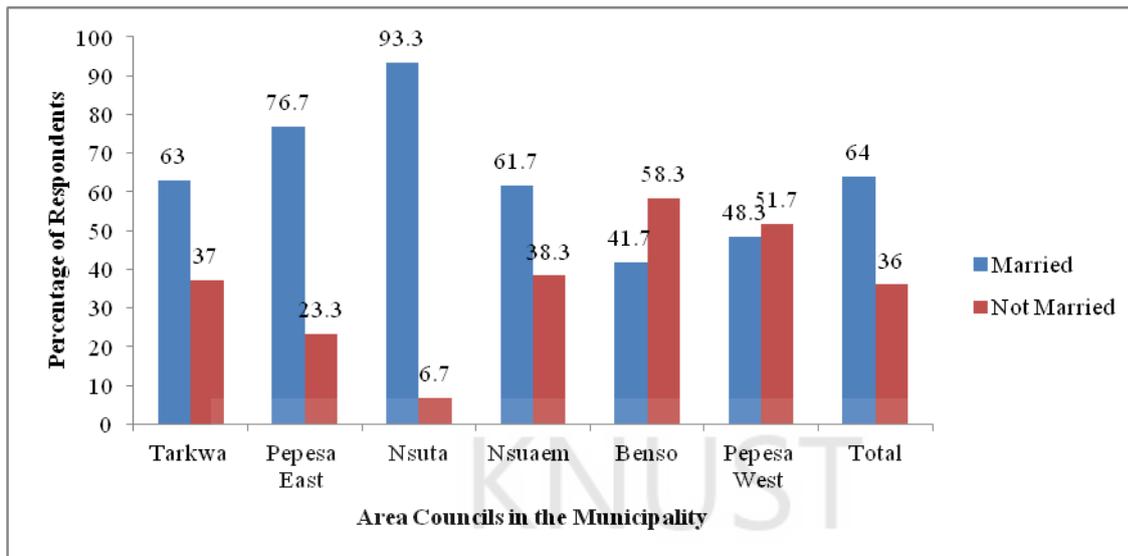
## **6.2 Nature of Social Capital in the Mining Communities**

Social capital denotes ties between people in similar demographic characteristics or situations, such as immediate family, close friends, neighbours and communities. The aspects of social capital covered in this section of the study are; marital status of household heads, places of origin of spouses, household size and dependency level and their health status.

### **6.2.1 Marital Status of Household Heads**

Responses from the household heads in the selected mining communities indicate that 64 percent of them were married whereas 36 percent were not. This varied across the various Area Councils. Pepesa East Area Council had the highest (76.70 percent) proportion of married household heads. Benso Area Council emerged as the area with the highest proportion (58.30 percent) of unmarried household heads. Across the various sexes, there were more married and unmarried males than females.

**Figure 6.4. Marital Status of Household Heads**



Source: Tarkwa-Nsuaem Field Survey August, 2010.

The results indicate that majority of household heads who were married were within the 31-40 age cohort with the least being within the 21-30 age group. Except for the 31-40 age cohort, the proportions of married persons in the various age groups were more than those who were not married as indicated in Table 6.2.

The understanding of marriage as a pivot in social capital development stems from core issues of the social networks it provides. Marriages provide access to groups' (nuclear and extended family) resources, with the outcome being enhanced economic rewards and social power. According to Bourdieu (1986) and Bourdieu and Wacquant (1992), this social network focuses on family and group relationships that have the potential of generating resources through family structures. This potential could therefore be effectively tapped to help attain sustainable livelihoods in the municipality.

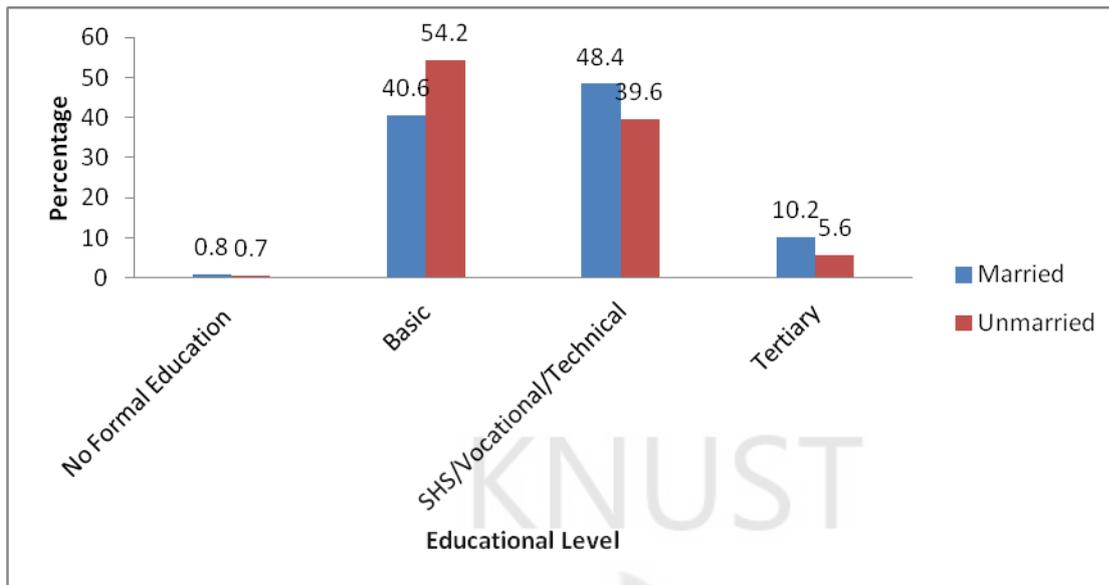
**Table 6. 2. Marital Status of Household Heads, by Age Category**

Age of Household Heads		Marital Status		Total
		Married	Not Married	
21-30	Number	5	5	10
	Percentage	1.25	1.25	2.5
31-40	Number	171	109	280
	Percentage	42.75	27.25	70
41-50	Number	56	26	82
	Percentage	14.00	6.50	20.50
51-60	Number	24	4	28
	Percentage	6.00	1.00	7.00
<b>Total</b>	<b>Number</b>	<b>256</b>	<b>144</b>	<b>400</b>
	<b>Percentage</b>	<b>64.00</b>	<b>36.00</b>	<b>100.00</b>

Source: Tarkwa-Nsuaem Field Survey, August, 2010

A comparative analysis made between educational level of the household heads and their marital status revealed that household heads with no formal education were the least married. The statistics do not indicate whether education in any way influences marriage. For those without any form of formal education, the study reveals that they constituted 0.8 percent and 0.7 percent of married and unmarried respondents respectively. Whereas the 48.40 percent of those who were married had attained secondary education, 38.30 percent had attained JHS/Middle school education (refer to Figure 6.5). With 64 percent of household heads being married, there exist some form of social cohesion and a wider social network (i.e. with relatives and friends of both partners) that married persons can rely on. These can contribute to building the economic livelihood of the household. To Putman (1995), the forces of long-term relationships, dense networks, and many potential spheres of cooperation are strongest within families. Evidence from several nations suggests that extended families often help family members that suffer bad news (Bentolila and Ichino, 2000). Family relations created through marriage are therefore expected to frequently provide important reserves of social capital. People who are not married may also have appreciable levels of responsibilities to members of the extended family particularly if they are engaged in some economic activities.

**Figure 6.5. Educational Status of Respondents by Marital Status**

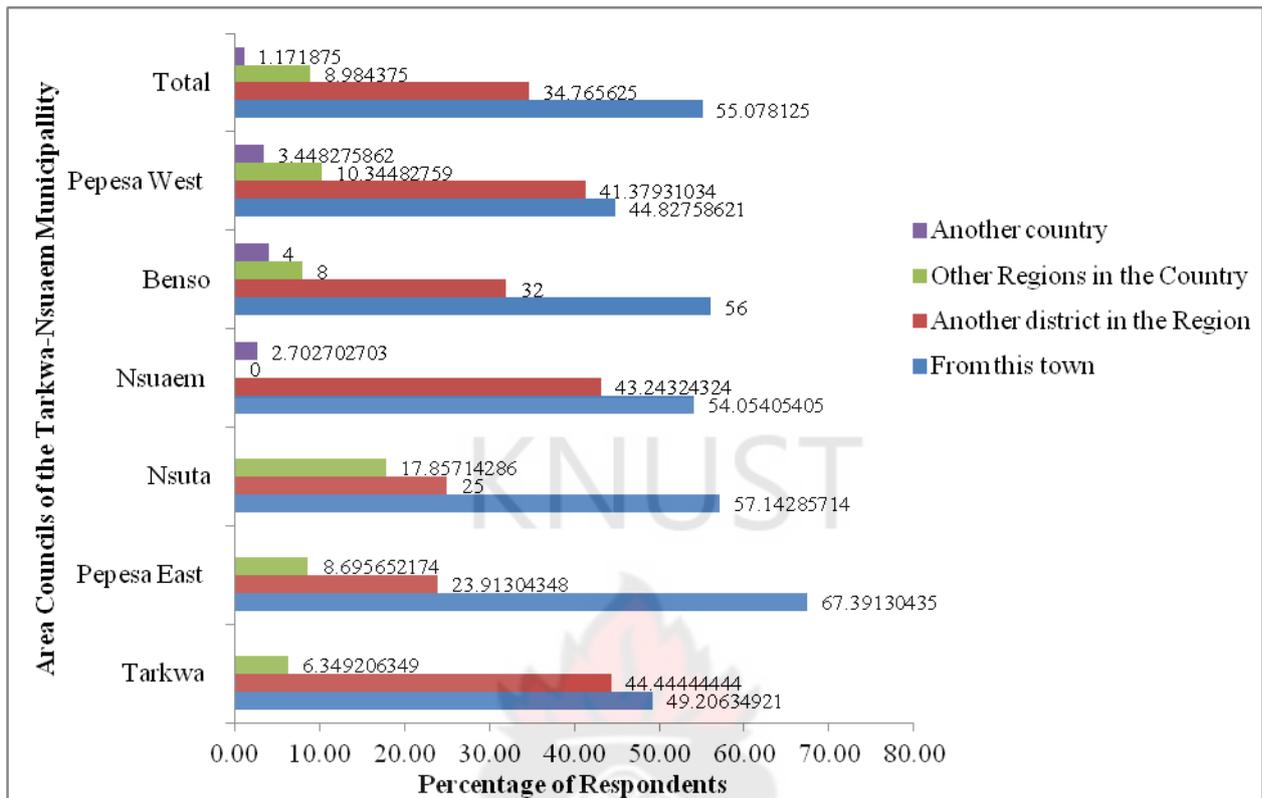


Source: Tarkwa-Nsuaem Field Survey, August, 2010

### 6.2.2 Places of Origin of Spouses

From Figure 6.6, 55.08 percent of the spouses came from the communities where they lived while 44.92 percent of the spouses were from communities other than where they lived. Spouse's places of origin however varied across the various area councils. For instance, 49.21 percent of the respondents from the Tarkwa Urban Council indicated that their spouses were from the area. For all the married household heads, 34.77 percent of their spouses came from other districts in the Western Region. In all cases, only 1.17 percent of the married household head had their spouses coming from another country.

**Figure 6.6. Places of Origin of Spouses**



Source: Tarkwa-Nsuaem Field Survey, August, 2010

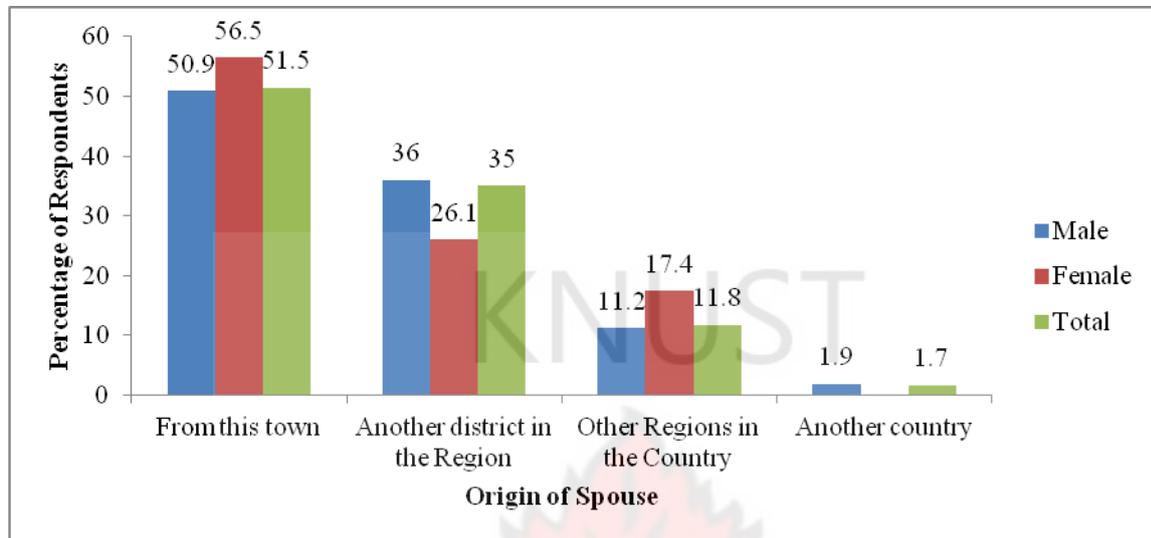
In a typical Ghanaian culture, females normally move to join their husbands after marriage. In an attempt to verify this, the sex of respondents was cross-tabulated with the origin of spouses. It was revealed that 56.50 percent of females who were married had their spouses coming from the communities in which they were living and 50.90 percent of the men also confirmed this (Figure 6.7).

Additionally, 36 percent of males had married from another district in the country and 26.10 percent of females had done same. This gives an indication of increasing inter-regional integration of both culture and economic diversities which builds a strong case for understanding the rationale for movements of these individuals. It also supports the popular belief that some migrants in mining communities end up marrying local people and consequently becoming part of the social network of these communities.

Staying at a place over a long period of time helps build trust, social cohesion and the necessary social networks that underpin the social capital of an individual. Trust can be understood as an optimistic expectation or belief regarding other agents' behaviour and may

sometimes arise from repeated interpersonal interaction which is facilitated by long duration of stay in a particular area (Fafchamps, 2002).

**Figure 6.7. Origin of Spouse by Sex Structure**



Source: Tarkwa-Nsuaem Field Survey, August, 2010

As a result of the long stay in an area, an individual acquires the general knowledge about the population of agents, the incentives they have, and the upbringing they have received (Plateau, 1994). This in turn builds trust in the dweller and in the people around him/her thereby creating a depth of asset to fall on in times of need and stress. The consequence is the creation of enabling economic agents that operate more efficiently for instance, by invoicing for goods they have delivered or by agreeing to stop hostilities (Fafchamps, 2002) or buying goods on credit in times of difficulty. To this end, respondents in the various mining communities may possess a great social capital potential.

The study results indicate that 44 percent of respondents had stayed in their respective communities for over 21 years and 8.25 percent between 1-5 years as indicated in Table 6.3. In the Tarkwa Urban Council, 55.0 percent of the household heads had stayed in their communities of residence for more than 21 years. In the Nsuaem Area Council, 55.0 percent was recorded while 53.3 percent, 46.70 percent and 41.70 percent were recorded for the Benso, Pepesa West and Pepesa East Area Councils respectively as indicated in Table 6.3.

**Table 6.3. Duration of Stay by Urban/ Area Council**

Duration of Stay		Area Councils						Total
		Tarkwa Urban Council	Pepesa East Area Council	Nsuta Area Council	Nsuaem Area Council	Benso Area Council	Pepesa West Area Council	
Up to 5 years	Number	8	7	9	2	2	5	33
	Percentage	2.00	1.75	2.25	0.50	0.50	1.25	8.25
6-10 years	Number	23	16	42	7	10	11	109
	Percentage	5.75	4.00	10.50	1.75	2.50	2.75	27.25
11-15 years	Number	14	6	6	18	14	14	72
	Percentage	3.50	1.50	1.50	4.50	3.50	3.50	18.00
16-20	Number	0	6	0	0	2	2	10
	Percentage	0.00	1.50	0.00	0.00	0.50	0.50	2.50
21+	Number	55	25	3	33	32	28	176
	Percentage	13.75	6.25	0.75	8.25	8.00	7.00	44.00
Total	Number	100	60	60	60	60	60	400
	Percentage	25.00	15.00	15.00	15.00	15.00	15.00	100.00

Source: Tarkwa-Nsuaem Field Survey, August, 2010

This makes community resource mobilisation and mutual help possible as trust would have been consolidated. In a sense, it would seem more likely that social trust is a key factor for enhancing individual well-being as well as socio-economic development at the community level (Yokoyama and Ishida, 2006).

### 6.2.3 Household Size and Dependency Level

The results of the study indicated that household sizes in the mining communities ranged between one and six as indicated in Table 6.4. The average household size was three which is lower than the municipality's average of 3.6 and national average of four (GSS, 2005). Single households accounted for about 27.80 percent of the total households in the communities. Majority (i.e. 59.40 percent) of the households had membership ranging from two to five while 12.80 percent of the households had more than six members (see Table 6.4). Similar trends were recorded across all the Area Councils in the Municipality.

Households with larger sizes stand in a position to develop a large potential of social capital as there existed a wider network for interaction and knowledge sharing. Several studies have revealed an interesting relationship between family sizes and social capital. Narayan and Cassidy (2001) found several different sub-dimensions of trust; a dimension of social capital

such as trust by people in their own tribe or caste, in other tribes in the same village, and among politicians, family members and government service providers.

**Table 6.4. Size of Household by Urban/Area Council**

		Area Councils					Total	
		Tarkwa Urban Council	Pepesa East Area Council	Nsuta Area Council	Nsuaem Area Council	Benso Area Council		Pepesa West Area Council
Size of Household								
1	Number	20	7	1	35	26	22	111
	Percentage	5.00	1.75	0.25	8.75	6.50	5.50	27.75
2	Number	21	4	12	2	4	4	47
	Percentage	5.25	1	3	0.5	1	1	11.75
3	Number	15	8	12	6	6	6	53
	Percentage	3.75	2.00	3.00	1.50	1.50	1.50	13.25
4	Number	19	9	24	5	7	7	71
	Percentage	4.75	2.25	6.00	1.25	1.75	1.75	17.75
5	Number	8	24	5	7	10	13	67
	Percentage	2.00	6.00	1.25	1.75	2.50	3.25	16.75
6+	Number	17	8	6	5	7	8	51
	Percentage	4.25	2.00	1.50	1.25	1.75	2.00	12.75
Total	Number	100	60	60	60	60	60	400
	Percentage	25.00	15.00	15.00	15.00	15.00	15.00	100.00

Source: Tarkwa-Nsuaem Field Survey, August, 2010

Despite this realisation of the family as a social capital, it is highly dependent on the human capital of the individuals in the family as children would offer lesser opportunities for livelihood enhancement than families with average adult working population. For this reason, it can be said that unless the social network and solidarity extends beyond one's family it may not have positive externalities; that is, the feeling of mutual support and solidarity is beneficial to the community when spread to other members of the community beyond close family (Moazami, 2006).

#### 6.2.4 Health Status of Respondents

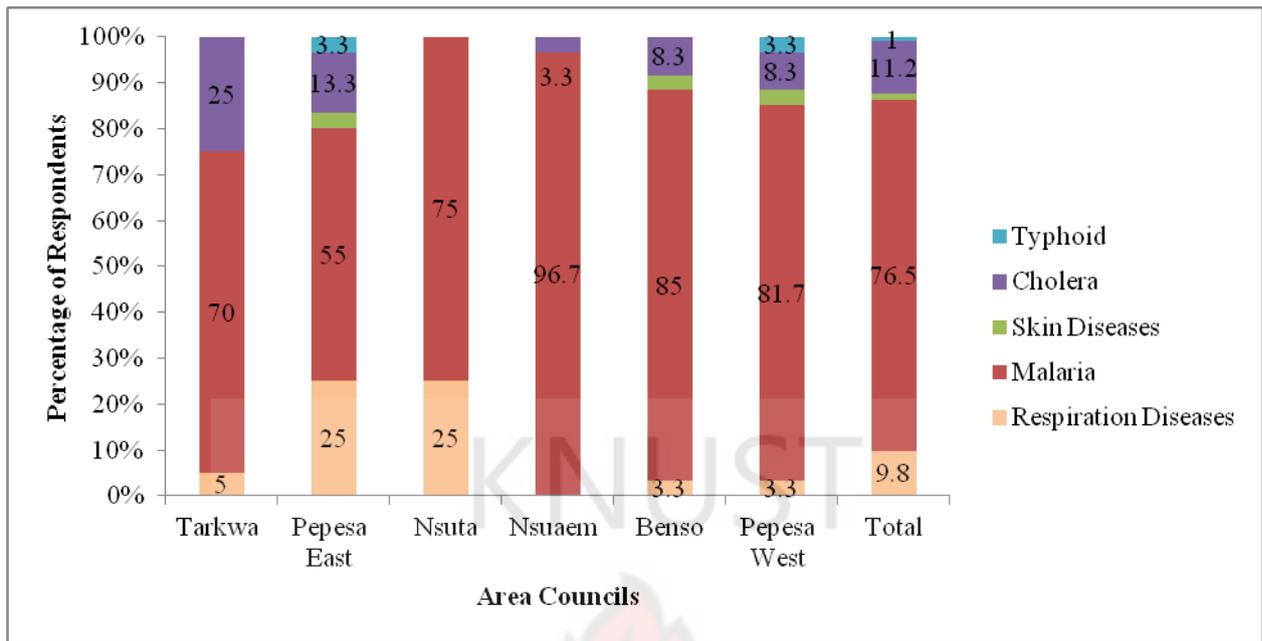
The health status of the respondent is an important component of livelihood. It in turn affects the other components of livelihood such as economic, physical and social. Mining however remains one of the most hazardous occupations in the world, both in terms of short term injuries and fatalities and long term impacts such as cancer and respiratory conditions such as silicosis, asbestosis and pneumoconiosis (Stephens and Ahern, 2001). In most mining communities, the issue of cyanide spillage into water bodies and the use of mercury in ASM are increasingly endangering community members and this has a direct impact on the

livelihood capabilities of the households in these mining communities. In Ghana, it is now well known that mercury, in sufficient quantities, poses a serious threat to human health. It is also deleterious to a wide-range of ecological entities. Health impacts are often difficult to detect and several studies cover scientific uncertainty in understanding health impacts related to mining particularly in the long term (Werner and Attfield, 2000).

The household heads indicated that malaria was the most common disease that affected members. Most of the respondents (i.e. 76.50 percent) attested to this fact. The trend was similar for all study communities in all the Area Councils as shown in Figure 6.8. The highest incidence of malaria is reported to have occurred in the Nsuaem Area Council where 96.70 percent of the respondents indicated malaria as the commonest disease suffered by household members. This situation was not different from the municipal, regional and national trends where malaria dominated as the commonest disease affecting household members. Respiratory diseases, typhoid, skin rashes, and cholera were also identified as some of the commonest diseases that affected households in the Municipality. According to the Municipal Health Statistician, malaria was the most common Out Patient Department (OPD) disease for the years 2008 and 2009. It accounted for 40.30 percent and 25.70 percent of all cases respectively. It was also the most common disease of admissions for the same period for 21.50 percent and 23.50 percent of all cases in 2008 and 2009 respectively. Malaria was again the most common cause of mortality in the municipality between 2008 and 2009 accounting for 6.8 percent and 10.20 percent of mortality cases respectively in all cases. The ten commonest OPD diseases, diseases of admissions and common causes of death in the municipality are listed in Appendix (2).

Even though malaria was a common disease that affected households in the municipality, it only constituted 23.20 percent of the identified mining related diseases that affected the households. According to IIED and WBCSD (2003), relatively isolated communities, including indigenous people, may be particularly vulnerable to diseases brought by miners, such as respiratory infections, influenza, malaria, and HIV and AIDS. For most household heads, respiratory diseases were the commonest diseases which they believed were induced by mining activities. Majority of household heads (66.20 percent) identified respiratory diseases as the common mining related diseases in the communities.

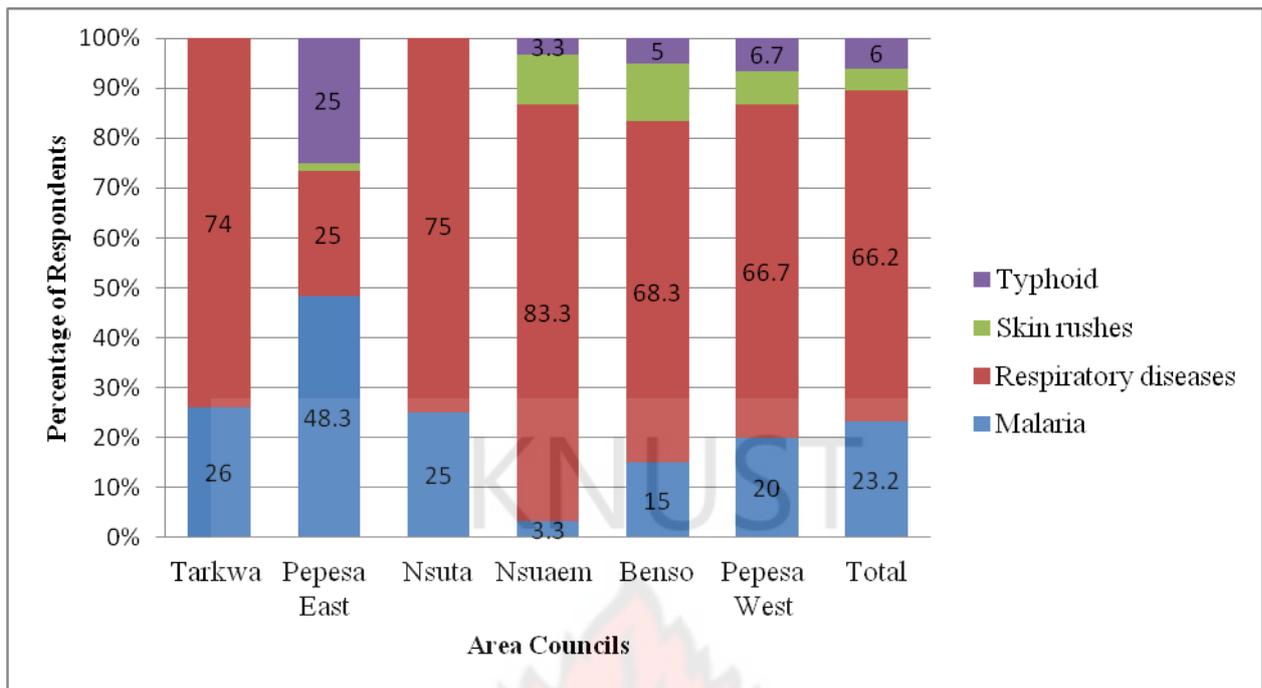
**Figure 6.8. Common Diseases Suffered by Respondents in the Urban/Area Councils**



Source: Tarkwa-Nsuaem Field Survey, August, 2010

According to the Municipal Health Service, the second most common disease in the Municipality between 2008 and 2009 was acute respiratory infection. Skin rashes recorded 4.50 percent and typhoid recorded six percent as indicated in Figure 6.9. Respondents gave different reasons for attributing the various types of diseases to mining. For instance, for 52.30 percent of them, excessive dust pollution was the cause of the disease, 3.0 percent attributed it to blasting, and 14.80 percent attributed it to uncovered pits while 30.0 percent attributed the cause of diseases to pollution of water bodies. However, these attributions were made in respect of the various diseases that respondents identified. Officials of the Municipal Health Service contacted also listed acute respiratory infections, skin diseases, malaria, ulcer, diarrhoea and tuberculosis. It was obvious from the study that the respondents had a clear understanding of what the primary causes of the mining related diseases were. Airborne contaminants, such as rock dust, were mainly produced during drilling operations, mineral extraction, loading, crushing of rock or ore, and blasting.

**Figure 6.9. Mine Related Diseases by Area Councils**



Source: Tarkwa-Nsuaem Field Survey, August, 2010

Persons exposed to excessive dust for long periods may suffer from permanent lung diseases, such as silicosis (Walle and Jennings, 2001). In addition, Walle and Jennings (2001) assert that fumes produced during shot-firing operations contain toxic gases (such as sulphur dioxide, nitrous oxide and nitric oxide) which, when inhaled, could lead to serious health damage of the lungs. Malaria was attributed to uncovered pits created by ASM activities and pollution from water bodies. Majority of household heads (91.67 percent) indicated that the pollution of water bodies was the primary cause of typhoid and diarrhoea in their communities. The Municipal Public Health Nurse and other officials were of the view that there was no direct link between mining activities and diseases or causes of mortality in the municipality. Most of the reported mine related deaths were through accidents. However, according to the Municipal Public Health Nurse, studies carried out over the years in the municipality revealed that tuberculosis for instance was a major health problem in galamsey communities.

It was also noted that there was indirect relationship between mining and some diseases such as HIV and AIDS. This is because commercial sex workers who contribute to the spread of the disease migrate to mining areas where they get good market. From literature, it is conceded that it is difficult to associate mining with malaria. IIED and WBCSD (2003)

acknowledge the existence of such a complexity of causal effects of mining for certain diseases. In some developing countries, it is often difficult to confirm a relationship between mining and the spread of already prevalent diseases such as malaria and HIV and AIDS. Nonetheless, the increased creation of uncovered pits as a result of ASM activities presents critical attributions that relate to malaria as the spread of the disease is compounded by stagnant water that collects in these pits and the pools of water around some of the processing centres. In other words, the mine sites could also be breeding grounds for waterborne diseases such as bilharzia. For instance, in Bougainville, local communities believe that an increase in malaria throughout the province was caused by an increase in the area of marshland created by mine tailings blocking river tributaries (Applied Geology Associates, 1989).

**Table 6.5. Reasons for Associating Diseases with Mining Activities**

Reasons for Associating diseases to mining activities		Mining related diseases				Total
		Malaria	Respiratory diseases	Skin rushes	Typhoid	
Too much dust	Number	15	184	10	0	209
	Percentage	3.75	46.00	2.50	0.00	52.25
Blasting	Number	6	6	0	0	12
	Percentage	1.50	1.50	0.00	0.00	3.00
Uncovered pit	Number	31	26	0	2	59
	Percentage	7.75	6.50	0.00	0.50	14.75
Pollution of water bodies	Number	41	49	8	22	120
	Percentage	10.25	12.25	2.00	5.50	30.00
Total	Number	93	265	18	24	400
	Percentage	23.25	66.25	4.50	6.00	100.00

Source: Tarkwa-Nsuaem Field Survey, August, 2010

### 6.3 Nature of Economic Capital in the Mining Communities

Economic capital consists of the capital base such as cash, credit/debt, savings, and other economic assets, including basic infrastructure and production equipment and technologies which are essential for the pursuit of any livelihood strategy. It is the economic capital that several authors erroneously equate to livelihood. However, this study has identified that livelihood transcends economic capital to include social, physical and human capital. They are mutually reinforcing. The aspects of economic capital considered in the study are employment and occupation.

### 6.3.1 Employment and Occupation

All household heads interviewed were engaged in various economic activities in either the formal or informal sectors of the local economy. The analysis revealed that 95 percent of the household heads were engaged in the informal sector in occupations such as farming, mining, artisanship and trading. The result further indicated that 50.50 percent of the household heads were miners as shown in Table 6.6. Nsuaem Area Council had the highest proportion (66.7 percent) of miners, followed by Pepesa West (65 percent) and Benso Area Councils (53.3 percent).

**Table 6.6. Major Occupation of Household Heads**

		Area Councils						Total
		Tarkwa Area Council	Pepesa East Area Council	Nsuta Area Council	Nsuaem Area Council	Benso Area Council	Pepesa West Area Council	
Farming	Number	21	25	13	15	19	15	108
	Percentage	21.00	41.70	21.70	25.00	31.70	25.00	27.00
Civil/public service	Number	12	3	0	2	2	1	20
	Percentage	12.00	5.00	0.00	3.30	3.30	1.70	5.00
Artisan	Number	1	7	4	1	3	2	18
	Percentage	1.00	11.70	6.70	1.70	5.00	3.30	4.50
Mining	Number	47	18	26	40	32	39	202
	Percentage	47.00	30.00	43.30	66.70	53.30	65.00	50.50
Trading	Number	19	7	17	2	4	3	52
	Percentage	19.00	11.70	28.30	3.30	6.70	5.00	13.00
Total	Number	100	60	60	60	60	60	400
	Percentage	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Tarkwa-Nsuaem Field Survey, August, 2010

ASM mining is the single most important provider of economic livelihoods for households as indicated in Table 6.7. This was especially true for male respondents who were mostly the breadwinners of their households. Mining also plays prominent roles in providing females with economic livelihoods. However, the greatest source of economic livelihood for adult females in the municipality was associated with commerce, hair dressing and sewing as presented in Table 6.7.

**Table 6.7. Occupational Distribution of Respondents and their Spouses by Sex**

Current Major Occupation		Sex of Respondents			Sex of Spouses		
		Male	Female	Total	Male	Female	Total
Farming	Number	107	1	108	5	24	29
	Percentage	26.75	0.25	27.00	1.95	9.38	11.33
Civil/public service	Number	20	0	20	0	14	14
	Percentage	5.00	0.00	5.00	0.00	5.47	5.47
Artisan	Number	10	8	18	7	118	125
	Percentage	2.50	2.00	4.50	2.73	46.09	48.83
Miner	Number	196	6	202	0	5	5
	Percentage	49.00	1.50	50.50	0.00	1.95	1.95
Trading	Number	37	15	52	11	72	83
	Percentage	9.25	3.75	13.00	4.30	28.13	32.42
Total	Number	370	30	400	23	233	256
	Percentage	92.50	7.50	100.00	8.98	91.02	100.00

Source: Tarkwa-Nsuaem Field Survey, August, 2010

The study identified that 91.02 percent were female spouses of respondents while 8.98 percent were male spouses. In terms of the occupation of the spouses 15.42 percent engaged in mining as compared to 50.5 percent of respondents. About 16.18 percent of female spouse were engaged in mining compared to 20 percent of female respondents who were engaged in mining (Table 6.7). Remarkable differences in proportions were recorded between the occupational distribution and occupation and sex for respondents and their spouses. The informal sector evident in trading, ASM, farming and artisanship in Table 6.7 played a critical role in the provision of employment and economic livelihoods for households.

Mining, particularly ASM was the most reliable economic activity for most breadwinners in the municipality. It had a direct impact on the livelihood capabilities of most households. From the study, 53.0 percent of breadwinners of the households depended on mining while 45.0 percent did not. In addition, the other occupations of most of the respondents also depended on mining. For the respondents who were engaged in the mining sector, 75 percent were engaged in ASM while 25 percent were employed in large mining companies. The workers who were not engaged in the mining sector (i.e. 49.5 percent) indicated that mining activities however indirectly triggered demand for their goods and services.

Beside the main occupation of the household heads, some of them had other jobs that provided them with income. While 28.0 percent of them had other sources of income, 72.0

percent did not. Respondents invested most of the earnings from their main occupation in activities such as farming (53.15 percent), trading (45.05 percent) and fishing (1.80 percent). As indicated in Table 6.8, 69.23 percent, 32.69 percent and 26.47 percent of miners, traders and artisans respectively invested in other jobs. Majority of miners invested in other businesses such as transportation, shops and housing. These household heads were aware of the erratic and eccentric nature of mining especially, ASM on which they depended and tended to invest in other livelihoods that they believed were more sustainable and could be relied upon in times of intermittency in demand and production. In terms of the prospects of these investments, 8.49 percent of all respondents indicated the prospects of their investments as high while 68.81 percent rated prospects to be moderate. The rest of the 22.70 percent rated the prospects of their business to be low. Those who indicated high prospects were optimistic of higher incomes as a result of increase in revenues.

The highest income earners in the municipality were miners and artisans. Out of the 202 miners covered 58.42 percent earned above GH¢ 201 a month as compared to only 16.67 percent of farmers who earned above GH¢ 201 a month as indicated in Table 6.9. Most respondents earned above the poverty line of US\$ 1.25 a day and the minimum wage of GH¢ 3.20 a day (i.e. US\$ 50.75 and GH¢ 92.4 a month). The analysis revealed that 4.50 percent of household heads earned below GH¢ 50 which is almost half of the minimum wage.

Overall, 61.8 percent of household heads indicated that their household financial standing was moderate. Only 8.80 percent considered their earnings as high while 29.50 percent indicated that it was poor. This trend in response was similar in all the Area Councils with the exception of Nsuta Area Council where majority of respondents indicated that their household financial standing was poor. A comparison between previous and current occupations of household heads revealed marked changes in the financial standing of respondents.

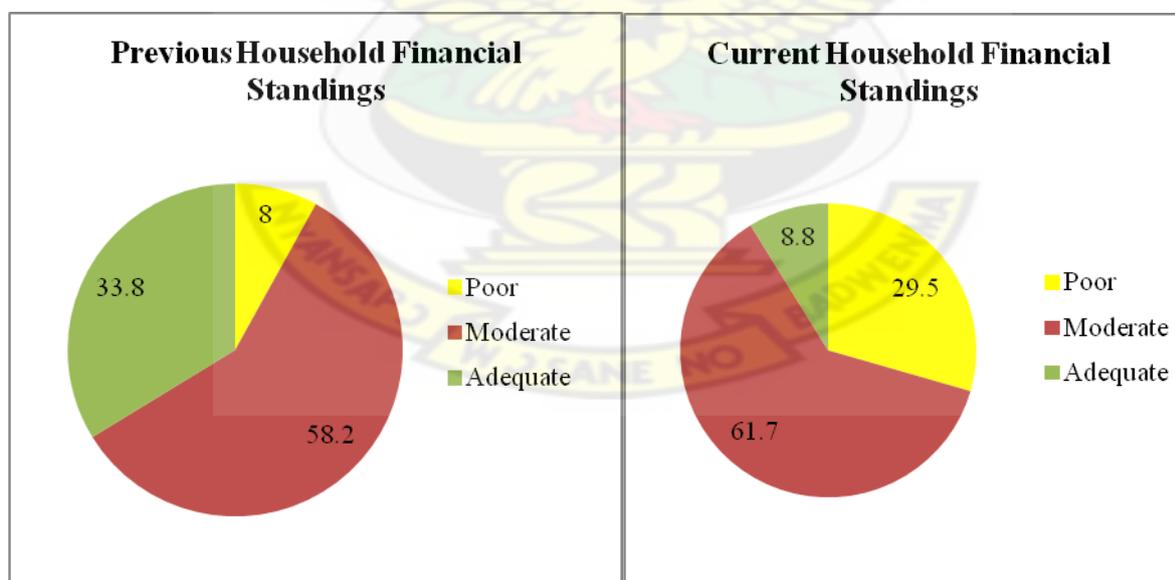
**Table 6.8. Monthly Earnings from Major Occupation**

Monthly Earnings from Occupation		Major Occupation					Total
		Farming	Civil/public service	Artisan	Miner	Trading	
Below GH¢ 50	Number	12	0	0	0	6	18
	Percentage	3.00	0.00	0.00	0.00	1.50	4.50
GH¢ 51-100	Number	29	0	2	5	14	50
	Percentage	7.25	0.00	0.50	1.25	3.50	12.50
GH¢ 101-150	Number	24	2	3	27	6	62
	Percentage	6.00	0.50	0.75	6.75	1.50	15.50
GH¢ 151-200	Number	25	9	3	52	5	94
	Percentage	6.25	2.25	0.75	13	1.25	23.5
GH¢ 201+	Number	18	9	10	118	21	176
	Percentage	4.50	2.25	2.50	29.50	5.25	44.00
Total	Number	108	20	18	202	52	400
	Percentage	27.00	5.00	4.50	50.50	13.00	100.00

Source: Tarkwa-Nsuaem Field Survey, August, 2010

As presented in Figure 6.10, the proportion of household heads who indicated poor financial standings increased from 8.0 percent to 29.50 percent while those who indicated adequate household financial standard decreased from 33.80 percent to 8.80 percent.

**Figure 6.10. Comparison between Previous and Current Household Financial Standing**



Source: Tarkwa-Nsuaem Field Survey, August, 2010

Different reasons were given by household heads for their household standings. For those that indicated adequate financial standings, 93.20 percent associated it with high income levels

while 48.60 percent of those who indicated poor financial standings attributed it to low incomes. Another marked observation was the fact that 37.10 percent of those who indicated poor financial standing also attributed it to high cost of living. This supports the fact that even with available economic opportunities and growing income levels, corresponding increases in the cost of living may erode the financial benefits of growing economies. The reasons for the various financial standings are indicated in Table 6.9.

**Table 6.9. Reasons for Financial Standings by Household Financial Standing**

Reasons for Financial Standings		Household Financial Standing			Total
		Adequate	Moderate	Poor	
High Income	Number	110	0	0	110
	Percentage	27.50	0.00	0.00	27.50
Low Cost of Living	Number	2	0	0	2
	Percentage	0.50	0.00	0.00	0.50
Moderate Incomes	Number	6	133	0	139
	Percentage	1.50	33.25	0.00	34.75
Moderate Dependents	Number	0	8	0	8
	Percentage	0.00	2.00	0.00	2.00
Moderate Cost of Living	Number	0	88	0	88
	Percentage	0.00	22.00	0.00	22.00
Moderate Prices of Goods and Services	Number	0	17	1	18
	Percentage	0.00	4.25	0.25	4.50
Low incomes	Number	0	0	17	17
	Percentage	0.00	0.00	4.25	4.25
High Dependents	Number	0	0	4	4
	Percentage	0.00	0.00	1.00	1.00
High Cost of Living	Number	0	1	13	14
	Percentage	0.00	0.25	3.25	3.50
Total	Number	118	247	35	400
	Percentage	29.50	61.75	8.75	100.00

Source: Tarkwa-Nsuaem Field Survey, August, 2010

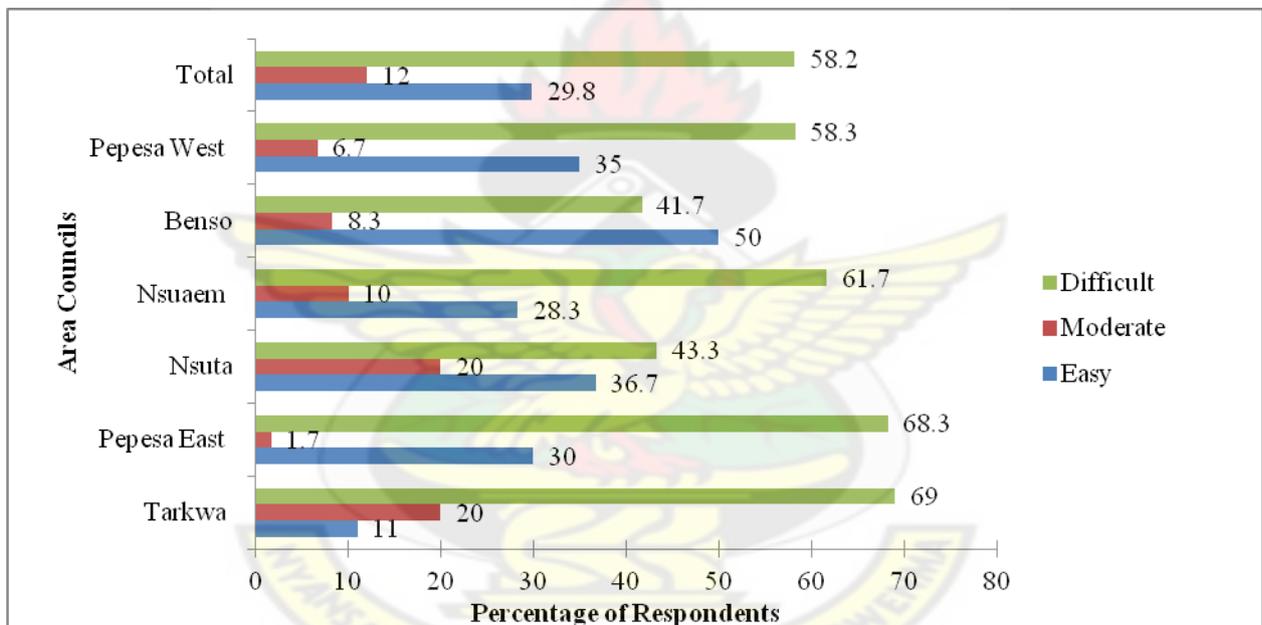
#### 6.4. Nature of Natural Capital in the Mining Communities

According to the Department for International Development (DFID) sustainable livelihood framework (DFID, 1999), natural capital is the term used for the natural resource stocks from which resource flows and services (e.g. nutrient recycling, erosion protection) useful for livelihoods are derived. There is a wide variation in the resources that make up natural capital, from intangible public goods such as the atmosphere and biodiversity to divisible assets used directly for production such as trees and land.

### 6.4.1 Accessibility to Land

Land is one of the critical assets that define the livelihoods of people. For most people in rural areas and ASM communities, land is the source of economic livelihood that underpins most of their livelihood strategies. Farming, collection of fuel woods, fishing and mining all depend on the availability and access to land. In the Municipality, 58.20 percent found it difficult to access land, 12 percent deemed it moderate while 29.8 percent find it easy to access land. Difficulties in access to land were identified in most of the area councils. Nsuaem, Tarkwa, Pepesa East and West recorded 61.7 percent, 69.0 percent, 68.30 percent and 58.3 percent respectively compared to the 41.70 percent in Benso and 43.30 percent in Nsuta Area Councils (Figure 6.11).

**Figure 6.11. Levels of Access to Land**



Source: Tarkwa-Nsuaem Field Survey, August, 2010

The study identified that 45.3 percent of the respondents who claimed land was easy to access were miners, 14.3 percent were traders, 3.4 percent were public sector workers while 31.2 percent were farmers. The remaining 5.9 percent was artisans. This trend was evident for all levels of accessibility except for those who expressed difficulty which was dominated by the public sector workers.

**Table 6.10. Level of Access to Land by Major Occupation**

Level of access to land		Major Occupation					Total
		Farming	Civil/public service	Artisan	Miner	Trading	
Easy	Number	37	4	7	54	17	119
	Percentage	9.25	1.00	1.75	13.50	4.25	29.75
Moderate	Number	9	2	0	24	13	48
	Percentage	2.25	0.5	0	6	3.25	12
Difficult	Number	62	14	11	124	22	233
	Percentage	15.50	3.50	2.75	31.00	5.50	58.25
Total	Number	108	20	18	202	52	400
	Percentage	27.00	5.00	4.50	50.50	13.00	100

Source: Tarkwa-Nsuaem Field Survey, August, 2010

From Table 6.10, it is apparent that most respondents saw accessibility to land in the municipality as difficult irrespective of their occupations. The respondents attributed this situation to the presence of miners (44.29 percent) in the area, proximity to mining sites (9.28 percent), high demand for such lands (15.54 percent), and the fact that most of the land in the municipality is under mining concession (30.89 percent).

For household heads who indicated easy access to land, 98.70 percent attributed it to the vast untapped natural environment available. Overall, only 23.0 percent of respondents related the difficult access to land to mining. This indicates the potential effects of mining on land accessibility in mining communities. Similarly, place of birth was also not a reason for why land accessibility was easy or difficult in the municipality as indicated in Table 6.11. According to the official interviewed at the Municipal Office of the Lands Commission, mining groups usually have problems with the indigenes over boundaries and that small scale mining groups or galamsey groups do not collaborate with the Commission. They rather prefer to resort to politicians to resolve land related issues. This measure is however not sustainable. Persistent land related disputes also do not enhance sustainable livelihood measures.

**Table 6.11. Level of Access to Land by Place of Birth**

Level of Access		Place of Birth					Total
		Native of community	Within municipality	Another district in the region	Other region	Other country	
Easy	Number	52	53	5	9	0	119
	Percentage	13.00	13.25	1.25	2.25	0.00	29.75
Moderate	Number	17	6	11	14	0	48
	Percentage	4.25	1.50	2.75	3.50	0.00	12.00
Difficult	Number	101	83	12	35	2	233
	Percentage	25.25	20.75	3.00	8.75	0.50	58.25
Total	Number	170	142	28	58	2	400
	Percentage	42.50	35.50	7.00	14.50	0.50	100.00

Source: Tarkwa-Nsuaem Field Survey, August, 2010

However, in most rural areas, it is explained by most researchers that accessibility to land is far easier than in urban areas. Emerging trend in literature is that much of the remaining unexploited ores in sufficient concentration to be attractive for modern commercial exploitation lie under indigenous lands and as pressure builds to gain access to their lands, a major sustainability and land access problem will unfold (Downing et al., 2002). In effect, the conclusion is that difficult accessibility to land in mining areas is an unfolding phenomenon that has not become a consolidated challenge in mining communities. It is however important to recognize that mining activities, especially ASM has and will continue to affect the land, territories, resources and the way of life of indigenous people (ICMM, 2010), of which difficulty in accessibility to land cannot be ruled out.

Accessibility to land in the national perspective is a daunting task as population continues to increase and serious problems confront accessibility to and security of tenure of land (Alhassan, 2006). Even though in the national context, land accessibility is deemed a huge challenge for businesses as the processes in registration and transfer of ownership is difficult, none of this was mentioned by the respondents in the mining communities in the Municipality. Customary landowner consultation and approval must be sought first and customary landowner consultation can be time consuming and expensive (Lole, 2005). In such circumstances, it is imperative to apprehend that for households in rural and/or mining communities, land is the most important asset for livelihood empowerment and sustainability. Therefore, indication of difficult access to land by both indigenes and in-migrants poses a great risk to sustainability of livelihoods. This is especially critical as land used for food

production can significantly reduce the vulnerability of the land owners and operators in cases of external shocks, such as loss of employment. In the case of Ghana where according to the Population and Housing Census in 2010, 49.9 percent of the population is rural and depend solely on primary land activities for their sustenance, preemptive interventionism is paramount.

All the respondents who received compensation for losing their lands indicated that they were involved in the valuation process specifically at the decision making stage which involved how much compensation they would receive. Respondents who were not involved in the allocation of their lands as concessions to mining companies indicated that only the chiefs are direct beneficiaries or those primarily affected by LSM. This has dire consequences on social capital development in these mining communities as those alienated in the process may feel aggrieved and reject interventions by other individuals especially when they are affected negatively by ASM activities for which they were not involved. However, in an interview with the Traditional Council, they expressed concern about the fact that they were not directly involved in concession allocation because of the legal provision in Article 257(6) of the 1992 Constitution of Ghana and Section 1 of the Minerals and Mining Act, Act 703 of 2006. These sections of the Constitution and Act state that; 'Every mineral in its natural state, under or upon any land in Ghana, rivers, streams, water course throughout Ghana, the exclusive economic zone and any area covered by the territorial sea or continental shelf is the property of the Republic of Ghana and shall be vested in the President on behalf of, and in trust for the people of Ghana.' In the view of the traditional authorities, this provision rather lures some of the sub chiefs to render unauthorised concessions to ASM groups and also work for LSMs as contractors. This usually causes most of such chiefs to lose their respect as traditional rulers before their subjects due to suspicions about bribery and corruption. It is also difficult to control the level of environmental destruction particularly land degradation when such community leaders are involved.

This therefore suggests alternatives that would enhance livelihoods sustainably as many more people in such communities may be worse off with increased ASM activities in their communities. Preventing a Pareto optimal outcome is very important for sustainable livelihoods. Situations where none could be made better off without making someone else worse off should be avoided and adequate systems initiated such that as economic activities take place, people would enhance their livelihoods without compromising the needs and

aspirations of others, that is; mining must seek to promote Pareto improvement which is engaging in economic activities that make at least one person better off without making any other person worse off.

## **6.5 Nature of Physical Capital in the Mining Communities**

The physical capital component of the sustainable livelihood framework encompasses issues relating to social infrastructure and accessibility. Many international aid agencies and research institutions have identified key components of the sustainable livelihood framework and for each livelihood capital. For instance, DFID (1999) identifies that in analysing the physical capital of a society, one must assess the issues of transportation, shelter, building and housing, availability and access to affordable energy, and access to potable and adequate water supply, sanitation and information. How people directly or indirectly support livelihoods; what access they have to them; and whether they have adequate shelter, water supply and sanitation were considered.

### **6.5.1 Household Heads' Houses of Occupation by Types**

Two main types of buildings that provide shelter in the municipality were identified. This was based on the building materials used for the construction of houses. Majority (52.5 percent) of the household heads resided in houses constructed with cement blocks while 47.50 percent lived in mud houses (i.e. houses made of either mud or mud bricks). All the houses were however roofed with aluminium sheets. In the Tarkwa Urban Council, all the respondents lived in houses made of cement blocks and this indicates a higher standard of living which can be associated with the urban nature of communities in the urban council. Similar characteristics were also observed at the Nsuta Area Council which was also a fairly urbanised area. As indicated in Table 6.12, Pepesa East and West, Nsuaem, and Benso Area Councils have majority of respondents living in buildings made of mud and is typical of rural areas and the types of materials used for housing.

**Table 6.12. Structure of Houses**

Structure of house		Area Councils					Total	
		Tarkwa Urban Council	Pepesa East Area Council	Nsuta Area Council	Nsuaem Area Council	Benso Area Council		Pepesa West Area Council
Cement block	Number	100	12	60	14	12	13	210
	Percentage	25.00	3.00	15.00	3.50	3.00	3.25	52.50
Mud	Number	0	48	0	46	48	47	190
	Percentage	0.00	12.00	0.00	11.50	12.00	11.75	47.50
Total	Number	100	60	60	60	60	60	400
	Percentage	25.00	15.00	15.00	15.00	15.00	15.00	100.00

Source: Tarkwa-Nsuaem Field Survey.

The study identified that household heads who were staying in the towns where they were born preferred to invest in permanent structures as compared to their counterparts from other communities, districts or regions. On the other hand, respondents who were not natives also preferred to stay in low-cost accommodation. They therefore invested in housing structures that were not costly by using easy to find raw materials for their housing structures and or stay in low cost building structures. Using cross-tabulation, it was observed that 64.79 percent of respondents born within the district but residing in other communities other than their place of birth were living in mud houses. All persons born in other countries were living in mud houses as indicated in Table 6.13.

In addition, it was revealed that the kind of occupation influenced the housing structures that respondents were living in. The research finding is not unique since the majority of workers in the informal economies of Africa, Asia and Latin America can be characterized as the working poor and suffer from multiple vicious cycles of poverty and vulnerability which perpetuate their low skills, low productivity employment, and low income working lives (Palmer, 2008). These poor workers live in houses with poor conditions and built of unsustainable materials.

**Table 6.13. Structure of House by Place of Birth and Current Major Occupation of Respondents**

Structure of house		Place of Birth					Total	Current Major Occupation					Total
		In this town	Within district	Another district in the region	Other region	Other country		Farming	Civil/public service	Artisan	Miner	Trading	
Cement block	No.	99	50	13	48	0	210	38	18	8	112	34	210
	%	24.75	12.5	3.25	12	0	52.5	9.50	4.50	2.00	28.00	8.50	52.50
Mud	No	71	92	15	10	2	190	70	2	10	90	18	190
	%	17.75	23	3.75	2.5	0.5	47.5	17.50	0.50	2.50	22.50	4.50	47.50
Total	No	170	142	28	58	2	400	108	20	18	202	52	400
	%	42.50	35.50	7.00	14.50	0.50	100.00	27.00	5.00	4.50	50.50	13.00	100.00

Source: Tarkwa-Nsuaem Field Survey, 2010

Most of these people are vulnerable (to risks and shocks) because they have the lowest income levels and do not have access to basic services such as education, health care and housing. In Ghana, the IFAD (2008) notes that poverty is most severe among food crop farmers, who are mainly traditional small-scale producers and about six in ten small-scale farmers are poor, and many are women. It was therefore not surprising that 64.81 percent of the farmers were found to be living in mud structures. This was also evident for artisans. Even though 44.55 percent and 34.62 percent of the respondents engaged in mining and trading lived in mud houses respectively, this was lower than the respondents engaged in the other informal occupations. This indicates mining as a potential asset for livelihood empowerment in the municipality if well monitored and controlled. It also goes to confirm the claim that ASM can play a crucial role in poverty alleviation and rural development; as most of those involved are poor and mining represents the most promising, if not the only, income opportunity available (Hentschel et al., 2003).

The effects of mining on housing in terms of the use of dynamite and other explosives to break rocks are indicated in Table 6.14. Only 19.50 percent of the household heads indicated that cracks had developed on their buildings from the use of explosives by mining companies and ASM while 80.50 percent indicated the contrary. This could be attributed to the fact that most ASM activities are undertaken far away from the various communities most notably in the natural environment and those who are affected are mainly those who live on the outskirts of mining communities. Nonetheless, it was observed that as ASM and other mining

activities continue to grow and mining activities draw closer to these communities, the potential effects of the explosions from mining activities may have dire ramifications for the housing structures of the various mining communities as was the case in some parts of Tarkwa where small scale mining activities were intensive. According to Hinton (2005), most galamsey operatives who work underground in the Tarkwa area operate just above the underground water table and close to the surface and this explains why the blasts from explosives they use were causing so much havoc to property on the land surface as in the case of the nursery block of the University of Mines and Technology (UMAT) Basic School and the Morning Star Hotel. According to the municipal office of EPA, the UMAT Basic School structures could collapse because the foundations of some of them had developed serious cracks as a result of the underground blasting. In the case of the Morning Star Hotel, some of the water closets were broken, there were cracks on the building and part of the land had caved in.

**Table 6.14. Cracks from Blast by Urban/Area Councils**

Cracks from blast		Area Councils						Total
		Tarkwa Urban Council	Pepesa East Area Council	Nsuta Area Council	Nsuaem Area Council	Benso Area Council	Pepesa West Area Council	
Cracks	Number	12	10	38	7	5	6	78
	Percentage	3.00	2.50	9.50	1.75	1.25	1.50	19.50
No Cracks	Number	88	50	22	53	55	54	322
	Percentage	22.00	12.50	5.50	13.25	13.75	13.50	80.50
Total	Number	100	60	60	60	60	60	400
	Percentage	25.00	15.00	15.00	15.00	15.00	15.00	100.00

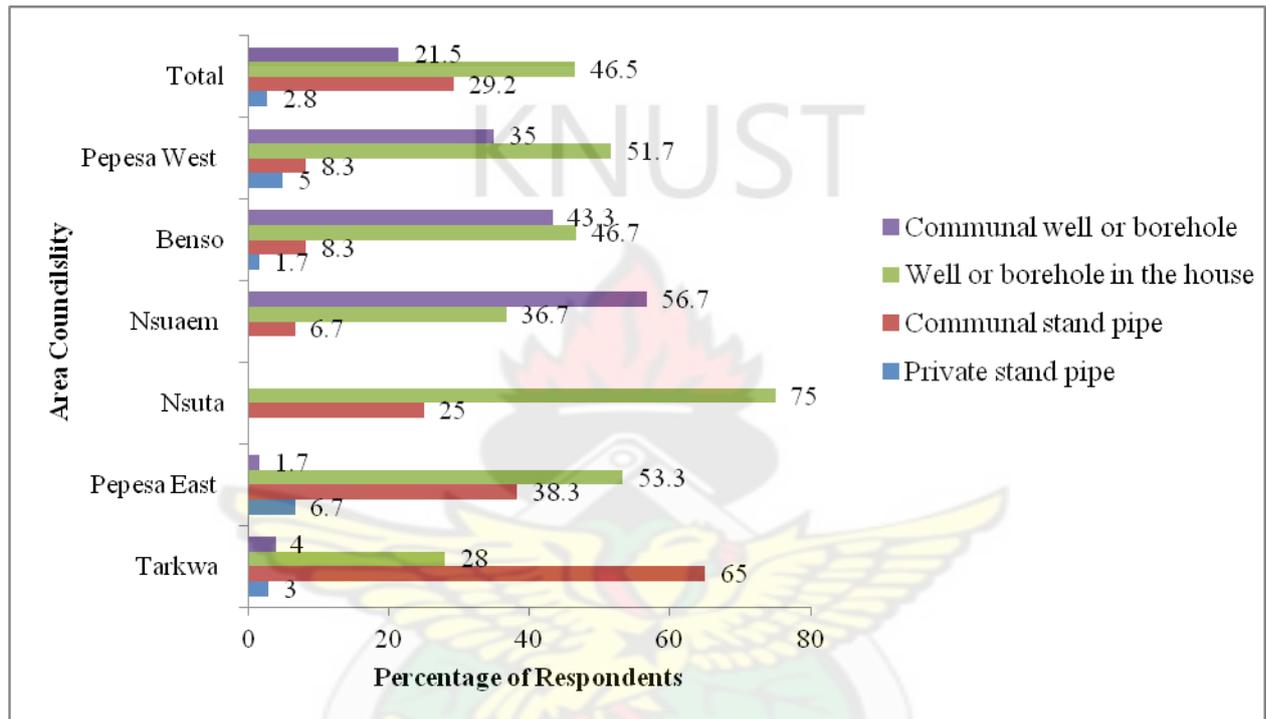
Source: Tarkwa-Nsuaem Field Survey.

### 6.5.2 Water and Sanitation

Four major sources of drinking water and water for other domestic activities were identified. Respondents in the Municipality depended on private stand pipes, communal stand pipes, wells/boreholes in the houses and communal wells or boreholes. Majority (51.50 percent) depended on communal water sources whereas 48.50 depended on private or home-based water sources for drinking and other domestic activities. As indicated in Figure 6.12, 46.80 percent depended on wells or boreholes in the house and relatively, this gives an indication of enhanced livelihoods support.

Whether this enhanced access to water services is as a result of mining is another issue. To verify the level of association of the type of occupation to access to potable water, a cross-tabulation was derived. From the analysis, it was observed that access to potable water was not influenced to a great extent by any of the occupations except respondents in the civil or public services.

**Figure 6.12. Sources of Drinking Water**



Source: Tarkwa-Nsuaem Field Survey August, 2010.

The results revealed that 80 percent of the household heads in the civil/public service owned a well or a borehole compared to 57.90 percent of farmers, 53.80 percent of artisans, 41.80 percent of miners and 61.50 percent of traders. This gives an indication of the low level of infusion and access to public services in the mining communities. In the absence of reliable public systems for water services, it can be said that households have invested in their own services to meet their domestic water needs.

Along with rock quarrying, mining for minerals like gold, coal, iron ore, bauxite and limestone impacts the quality of water and drastically lowers the water table (Nitya and Sunetra, 2009). Mining therefore affects surface and underground water reserves in varied ways. In other circumstances, mining can pollute surface water bodies as a result of cyanide

spillage from large scale mining firms or mercury contamination from ASM activities. ASM also may cause sedimentation of surface water which in some cases leads to siltation of dams. Ghana has experienced its fair share of water related mining pollution. According to WACAM (2004), communities in mining areas were confronted with major livelihood problems associated with pollution of water bodies and unemployment. The NGO cited that a mining company was dumping manganese waste into the River Bonsa which is the main source of drinking water for Tarkwa and its environs which had the potential of worsening the health of the people in the Municipality. The pollution of water bodies is a major problem in the municipality and during the research; all stakeholders expressed concern about the issue. According to the head of the Municipal Office of the EPA, pollution of water bodies is a serious problem in the municipality. Most of the ASMs process their ores near streams or rivers and the materials washed into these water bodies increased turbidity.

There was also mercury and other chemical spillage into water bodies which posed a serious health threat to the people. The dewatering of underground mines without regard to water quality was also a serious problem in the mining communities. All these were observed at the various ASM and processing sites covered by the study. For instance, River Bediabewo had been polluted so much that the water was brown in colour especially at Bakoakohu and Efuanta near Tarkwa. River Bonsa was also constantly polluted by galamsey operators. In spite of the various collaborations between the Municipal office of the Ghana Water Company, Municipal Assembly, The Police Service and the Traditional Authorities, the galamsey groups had been very uncooperative. According to the Municipal Office of the Ghana Water Company, the system of water supply in the municipality was not very good and that there was the need to expand the existing water system in the municipality. The above factors could explain why most households were dependent on their own sources of water as they were afraid of drinking water from contaminated rivers. Despite the fact that respondents did not depend extensively on surface water, there was still a critical challenge as majority of the respondents depended on underground water which could also be contaminated by mining activities.

In terms of sanitation, two main parameters were considered; type of toilet facility and refuse disposal method. Three main toilet facilities were available in the Municipality. Majority (58.50 percent) of respondents used the pit latrine while 31.50 percent used water closets (WC). The remaining 10.00 percent of the respondents used KVIPs as indicated in Table 6.15.

**Table 6.15. Type of Households Toilet Facility by Area Council**

Type of toilet facility		Area Councils						Total
		Tarkwa Urban Council	Pepesa East Area Council	Nsuta Area Council	Nsuaem Area Council	Benso Area Council	Pepesa West Area Council	
KVIP	Number	5	10	5	13	4	3	40
	Percentage	1.25	2.50	1.25	3.25	1.00	0.75	10.00
Pit latrine	Number	40	35	31	35	45	48	234
	Percentage	10.00	8.75	7.75	8.75	11.25	12.00	58.50
WC	Number	55	15	24	12	11	9	126
	Percentage	13.75	3.75	6.00	3.00	2.75	2.25	31.50
Total	Number	100	60	60	60	60	60	400
	Percentage	25.00	15.00	15.00	15.00	15.00	15.00	100.00

Source: Tarkwa-Nsuaem Field Survey.

For refuse disposal, the study identified that respondents either emptied their refuse in open space or dumped them at a designated place. In the Tarkwa Urban Council, 79.0 percent of household heads used designated dumping points whereas 21 percent used the open space (Table 6.16). In the Nsuta Area Council, all respondents used designated dumping points while in Pepesa East, Nsuaem, Benso and Pepesa West Area Councils all respondents used the open-space. This is a clear indication of poor sanitation systems and structures in the latter area councils and calls for immediate amelioration. This therefore could be linked to the prevalence of malaria and diarrhoea in some of these area councils which could affect the human capital base of the municipality.

**Table 6.16. Refuse Disposal Methods by Area Councils**

Refuse Disposal		Area Councils						Total
		Tarkwa urbann Council	Pepesa East Area Council	Nsuta Area Council	Nsuaem Area Council	Benso Area Council	Pepesa West Area Council	
Collection/ designated point	Number	79	0	59	0	0	0	138
	Percentage	19.75	0.00	14.75	0.00	0.00	0.00	34.50
Open Space	Number	21	60	1	60	60	60	262
	Percentage	5.25	15.00	0.25	15.00	15.00	15.00	65.50
Total	Number	100	60	60	60	60	60	400
	Percentage	25.00	15.00	15.00	15.00	15.00	15.00	100.00

Source: Tarkwa-Nsuaem Field Survey.

### 6.5.3 Households' Energy Utilisation

In terms of energy, assessments were made on energy for cooking and energy for lighting. The results indicated that 94 percent of the respondents interviewed used electricity for lighting but only 1.50 percent used it for cooking. Energy forms for cooking included fuel wood, liquefied petroleum gas (LPG), electricity and charcoal. Regarding fuel for cooking, it emerged that 41.25 percent used charcoal which was followed by fuel wood, 22.25 percent. Charcoal and fuel wood were used predominantly in rural communities whereas LPG usage was mainly in urban communities. In the Tarkwa and Nsuta Area from Councils, LPG utilisation was 60 percent and 51.67 percent respectively (see Table 6.17).

**Table 6.17. Households' Energy Access by Type and Area Councils**

		Area Councils						Total
		Tarkwa Urban Council	Pepesa East Area Council	Nsuta Area Council	Nsuaem Area Council	Benso Area Council	Pepesa West Area Council	
Fuelwood	Number	7	16	8	17	21	20	89
	Percentage	1.75	4.00	2.00	4.25	5.25	5.00	22.25
LPG	Number	60	11	31	15	14	9	140
	Percentage	15.00	2.75	7.75	3.75	3.50	2.25	35.00
Electricity	Number	3	0	2	1	0	0	6
	Percentage	0.75	0.00	0.50	0.25	0.00	0.00	1.50
Charcoal	Number	30	33	19	27	25	31	165
	Percentage	7.50	8.25	4.75	6.75	6.25	7.75	41.25
<b>Total</b>	Number	100	60	60	60	60	60	400
	Percentage	25.00	15.00	15.00	15.00	15.00	15.00	100.00

Source: Tarkwa-Nsuaem Field Survey.

Fuel wood and charcoal usage was also predominant among all the major occupations and income groups. Similar trends were observed when energy for domestic purposes was compared to the income levels of respondents. For instance, 65.0 percent of those earning GH¢ 51-100 a month use charcoal as their domestic energy source compared with 65.97 percent of respondents earning above GH¢ 201 a month. Characteristically, very low income earners (i.e. those earning less than GH¢50 per month depended heavily on fuel wood which were mostly gathered free from the wild. Similarly, LPG use was not determined by the level of income of household as 16.67 percent of those earning GH¢ 50 a month use this energy source which was similar to proportions recorded for those earning between GH¢ 151-200 and above GH¢ 201 per month.

From the above, it can be said that the nature of livelihoods in the Tarkwa Nsuaem municipality is complex. In terms of factors that influence respondents of mining communities to enhance their human capital, it was realised that education and economic reasons were paramount. From the study, over 70 percent of respondents were influenced by economic factors to make livelihood decisions. The critical issues of income and employment influenced the decisions to access education and health services for the household. The various indicators of sustainable livelihoods such as human, social, economic, natural and physical capitals have both positive and negative implications. If these are managed effectively and efficiently by all stakeholders, then livelihood sustainability could be ensured in the mining communities of the municipality.



**CHAPTER SEVEN**  
**FACTORS THAT AFFECT LIVELIHOOD CHOICES IN THE MINING**  
**COMMUNITIES IN THE TARKWA NSUAEM MUNICIPALITY**

Chapter six identified the various typologies of livelihoods in the mining communities in the Tarkwa-Nsuaem municipality. In line with the UNDP's livelihood framework reviewed in chapter two, the livelihoods identified included the human, natural, social, human and economic capital. Evidence in literature indicates that myriad factors inform people's livelihood choices. Some of these factors are education, access to health, water and sanitation, housing and transportation, availability of resources and occupation. Several issues of the type of services to access and the alternatives to adopt in accessing the services are also some of the decisions that inform people's choice of livelihoods. For instance, transport modes provide the physical means to facilitate movement. Their presence or absence influence human decision-making, enhancing or reducing the accessibility of specific fixed locations (Maunder et. al., 2001) for socio-economic services and opportunities. Decisions relating to equity, ownership of resources and participation therefore require the existence of ecological, socio-cultural, economic and political options which all characterise the sustainable livelihood frameworks. All these influence decisions and actions. Most importantly, these factors enable people to explore the limits of their assets, capabilities and capital very openly and encourage communities to make informed decisions on whether to invest their time and resources in a particular livelihood. Overall, the very 'concept of livelihood' tends to direct attention to the household as the decision-making unit since it is at this level that various economic activities are combined into particular livelihood strategies (Krantz, 2001).

It is widely believed that ASM is a last resort for poor, landless, unemployed, and poorly educated people, who hope to escape complete social and economic impoverishments (Hentschel et. al., 2002). This however is not the case all the time. Occupation is not the only livelihood choice that people in mining communities make. There are many factors that influence the choice of livelihoods in mining communities. Some of the factors are based on the background characteristics of the individuals such as age, gender, education or the type of skills one has. Other factors that influence the choice of livelihoods are based on social, physical and natural capital available. Some of the possible choices and the influencing factors are therefore discussed in this part of the study.

## **7.1 Socio-Economic Factors that Affect Livelihood Choices of Household Heads**

Skills, education, access to natural and physical asset and the quest for better standards of living and sustainable livelihoods were the main factors that influenced the choice of livelihoods for household heads.

### **7.1.1 Education and Skills.**

The educational background and skills of the household heads also influenced the choice of livelihoods. From the analysis of data, there was a high level of literacy (99.92 percent) but they lacked the basic technical skills and qualification for employment in the formal mining sector. Majority (i.e. 95 percent) were therefore engaged in the informal sector. Furthermore, as many as 75 percent of the 202 workers who worked in the mining sector, were engaged in the ASM sector. Educational background and skills also influence the choice of livelihoods.

### **7.1.2 Age, Gender and Culture**

All household heads were engaged in economic` activities either in the formal or informal sectors. They all fell within the economically active age groups. Their ages ranged between 21 and 60 years with 70 percent of them being within the 31-40 year age group. Majority of the respondents (i.e. 50.50 percent) were engaged in mining particularly ASM. It can be said that age influences the choice of livelihoods. The sex of respondents also influenced the choice of livelihoods. For instance, out of a total of 202 household heads who were miners, only 6, (2.97 percent) were females. On the other hand, 50 percent of female household heads were traders. This supports the popular belief that certain livelihoods are culturally defined and this influenced the choice of livelihoods of the household heads. From the survey data, sex is seen to influence livelihoods in the mining communities. This is linked to the cultural belief that defines the livelihoods of individuals based on gender. The belief is that women are not strong enough to dig for the minerals. Their operations are thus limited to conveying of the sand to the processing points for processing.

### **7.1.3 Socio-Economic Opportunities Available**

Access to natural and physical capital is critical to the choice of livelihoods and defines the livelihoods of people. For instance, access to land is key to livelihood strategies for many people in rural areas and mining communities. In the municipality, 58.20 percent of the household heads found it difficult to access land, 12 percent deemed it moderate while 29.8 percent expressed ease in access to land. It is only the ASM workers who regard access to

land easy. Due to this, the sector that employs the highest proportion of the labour force in the mining communities is mining.

#### 7.1.4 Quest for Better Standard of Living and Sustainable Livelihood

From the analysis of the physical capital<sup>5</sup>, it was revealed that one's source of livelihood influenced the kind and quality of infrastructure accessed by household heads. For instance, the housing structures that respondents were living in were influenced by their livelihoods. This is supported by the fact that 64.81 percent of the farming household heads were found to be living in mud structures. Furthermore, 44.55 percent of the miners and 34.62 percent of the traders in the mining communities in the municipality lived housing units built from mud. The highest income earners in the municipality were miners and artisans. Out of 202 miners covered, 58.42 percent earned above GH¢ 201 a month as compared to only 16.67 percent of farmers who earned above GH¢ 201 per month as already indicated in Table 6.8 in the previous chapter. Mining appears to be the most lucrative job which offers better standard of living and this is probably why majority of the household heads i.e. 50.50 percent, have chosen mining as their major source of livelihood.

However, the quest for sustainable livelihood also influences the choice of livelihoods. As indicated in Table 7.8 (in the previous chapter), 69.23 percent, 32.69 percent and 26.47 percent of miners, traders and artisans respectively invested their incomes in other businesses. Majority of miners invested in other businesses such as transportation, shops and housing that are considered legal businesses which are more sustainable. The investment in other sectors is deemed to be a security measure intended to serve as alternatives if the minerals are depleted. Phantom towns that often emerge as a result of the closure of mining firms would be curtailed with these alternative livelihood strategies.

In terms of the prospects of these alternative investments, 8.49 percent of all respondents indicated that the prospects were high while 68.81 percent rated the prospects to be moderate. The remaining 22.70 percent rated the prospects of their businesses to be low. Those who indicated high prospects were optimistic of higher incomes as a result of increase in revenues. In sum, the research observed that two factors influenced the household heads' investments in

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<sup>5</sup> Physical capital comprises the basic infrastructure and producer goods needed to support livelihoods. Physical capital from this perspective comprises affordable, adequate and secure transportation, adequate water supply and sanitation, and clean, affordable energy.

other economic activities; first, the fact that ASM operations are not sustainable owing to the finite nature of the minerals and secondly, the high risk associated with the illegal mining operations.

## **7.2 Factors that Affect Household Size as a Livelihood Asset**

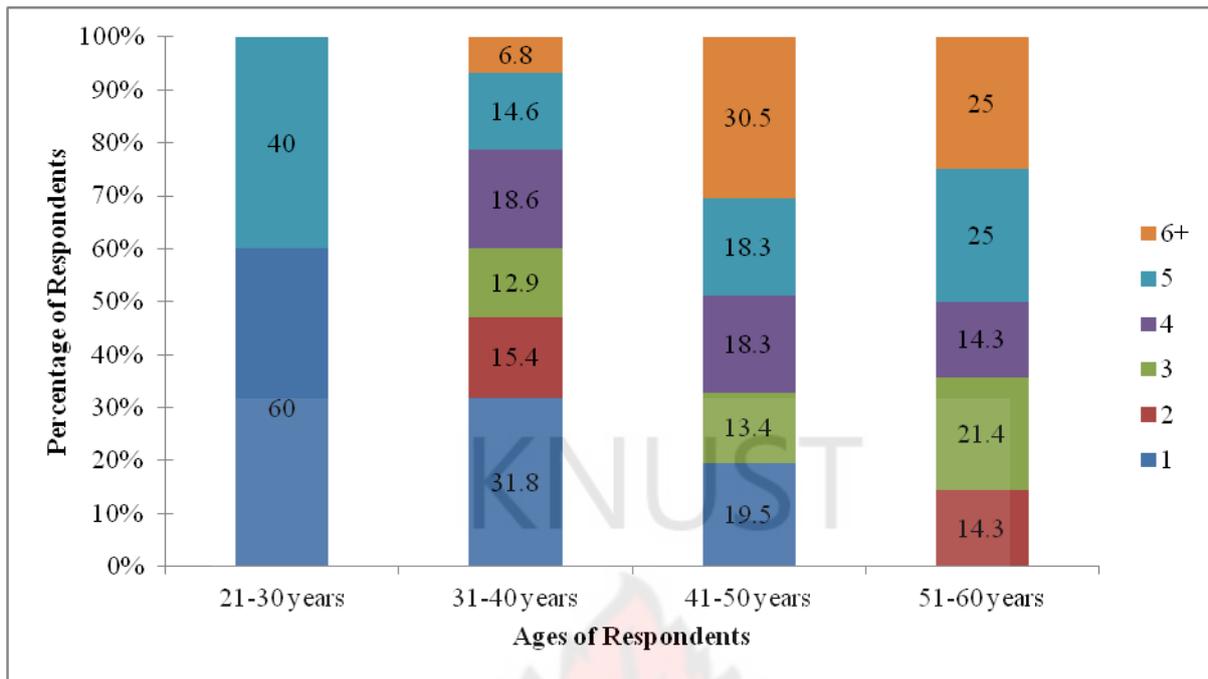
For choices on the size of household, which is a social asset in the livelihood framework, there were marked differences between indicators for education, gender, age, and monthly income of household heads. These are therefore critically examined in this section.

### **7.2.1 Gender and Household Size**

The analysis of data revealed that male headed households had smaller household sizes than their female counterparts. With a mean household size of 3.1 persons per male-headed household compared to 4.5 persons per female-headed household, it appeared that the latter preferred larger household sizes. The households headed by females had household sizes greater than the national average of 4 persons per household. This could have serious ramifications for household sustenance and management if household income levels are low. Further evidence from the data indicated that 50 percent of all male respondents had their household sizes less than four persons per household while more than 50 percent of female headed households had an average of five persons per household.

Investigations revealed that the age of the household head was one of the factors that affect the household size in the mining communities. As indicated in Figure 7.1, household heads within the ages of 21 and 30 years had smaller household sizes. With 60 percent of respondents in single households, it is clear that most of these were youthful and were mostly in the process of developing livelihood assets and capabilities that would support larger household size. Between the ages of 31 and 40 years, 68.20 percent lived in households of sizes greater than or equal to two, while 80.50 percent of the household heads aged between 41 and 50 years lived in households with sizes greater than or equal to three. A total of 85.70 percent of the household heads lived in households with sizes greater than or equal to three. From the above, it can be said that household size was influenced by the age of the head of household. It can therefore be said that age is a factor associated with choices of household sizes. In essence, as people grow they turn to expand their family sizes (probably due to the extended family system) and this influences their social capital in the form of social cohesion and networks which serve as a form of livelihood insurance in the future.

**Figure 7.1. Size of Household by Age of Respondents**



Source: Tarkwa-Nsuaem Field Survey.

### 7.2.2 Economic Capital and the Choice of Household Sizes

Economic conditions also affect the number of persons in a household in different ways. It is generally believed that it is the poor who normally have larger household sizes as they perceive their dependants, especially children as their wealth and labour for their economic activities. The study provides evidence for this assertion since 83.3 percent of the household heads who earned below GH¢ 50.0 per month had household sizes of six or more as indicated in Table 7.1. On the other hand, 90 percent of the households which earned GH¢51-100, had household sizes between one and five persons. Similar observations were made within the other income groups as presented in Table 7.1. The same observation was made among farmers and other types of occupation. In this case, the respondents who were farmers and were low income earners had larger household sizes than the income earning occupations like mining and trading. A larger proportion (i.e. 94.80 percent) of the farmers and 76.90 percent of artisans had household sizes of between four and above six; which are greater than the national average of four persons per household. Thus, one of the factors affecting livelihoods in the mining host communities in the Tarkwa-Nsuaem Municipality is the household size which in turn influences the household incomes; a major determinant of economic assets.

**Table 7.1. Size of Household by Monthly Earnings from Current Occupation**

Size of Household		Monthly Earnings from Current Occupation					Total
		Below GH¢ 50	GH¢51- 100	GH¢101- 150	GH¢151- 200	GH¢201+	
1	Number	0	4	27	26	53	111
	Percentage	0.00	1.00	6.75	6.50	13.25	27.75
2	Number	0	10	17	10	10	47
	Percentage	0.00	2.50	4.25	2.50	2.50	11.75
3	Number	1	8	7	16	21	53
	Percentage	0.25	2.00	1.75	4.00	5.25	13.25
4	Number	0	8	18	11	34	71
	Percentage	0.00	2.00	4.50	2.75	8.50	17.75
5	Number	0	6	3	14	44	67
	Percentage	0.00	1.50	0.75	3.50	11.00	16.75
6+	Number	5	4	7	6	29	51
	Percentage	1.25	1	1.75	1.5	7.25	12.75
<b>Total</b>	Number	6	40	79	83	191	400
	Percentage	1.50	10.00	19.75	20.75	47.75	100.00

Source: Tarkwa-Nsuaem Field Survey, 2010.

Even though this may be the case for low income workers of the informal sector, it is only the observation of farmers that present critical issues of livelihood challenges unlike artisans who were among the highest paid occupations in the municipality. For the civil/public service, 20.0 percent of the respondents in the occupation had family size of four persons per household with the rest having less than three persons per household. Similarly, 56.90 percent of miners had household sizes of less than four. It is obvious that a single conclusion cannot be made for occupation as a factor that determines the size of a household.

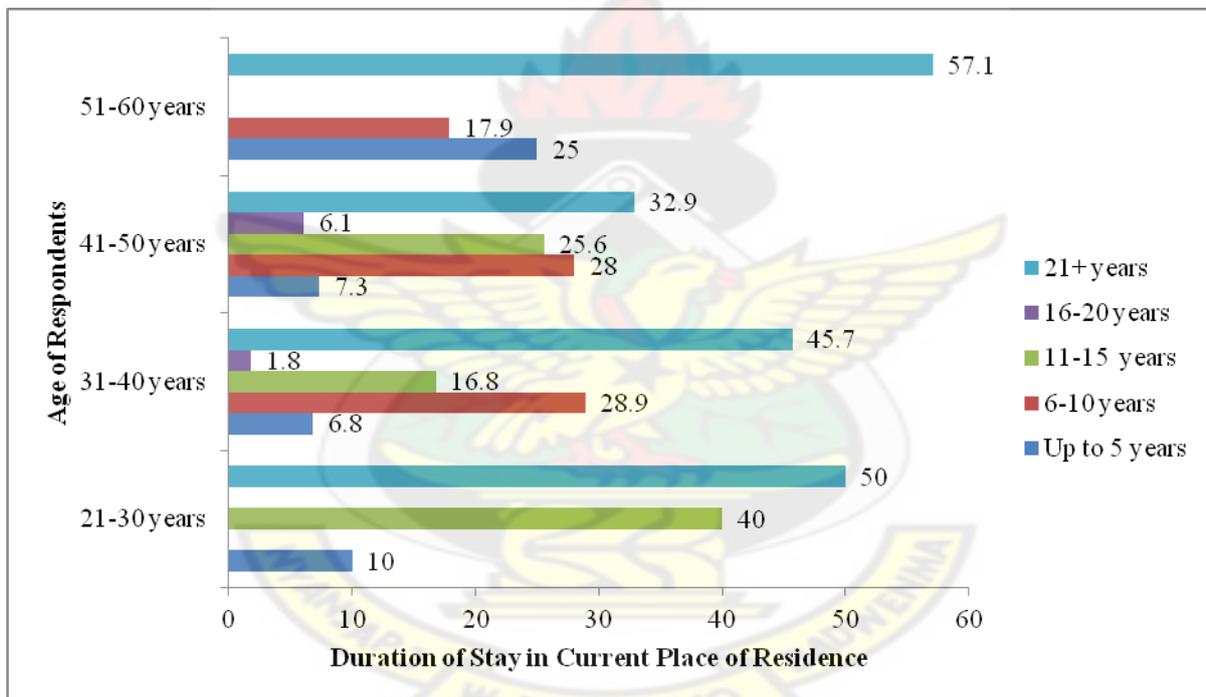
### 7.3. Duration of Stay in the Mining Communities

The duration of stay is one of the factors that affect livelihoods in the mining communities. People acquire assets at places where they have lived or intend to live for long periods. It was observed that age, place of birth, number of dependants, monthly income and occupation were among the factors that influenced decisions on the number of years to stay in the selected communities in the Tarkwa-Nsuaem Municipality.

### 7.3.1 Duration of Stay by Age of Respondents

In Figure 7.2, 90 percent of the respondents between the ages of 21 and 30 years had lived in their communities for over 11 years. The proportion reduced as the age grouping increased for the same duration. For instance, 64.30 percent of all those between the ages of 31 and 40 years had lived in their communities for more than 11 years as compared to 64.70 percent of those between 41 and 50 years and 57.10 percent for the 51 and 60 years age group. Taking the individual groupings again, it was observed that majority of respondents in the municipality had stayed in the mining communities for more than 21 years. This therefore gives them the opportunity to have wider social networks that also influence their choice of livelihoods such as mining and farming which are the dominant occupations.

**Figure 7.2. Duration of Stay in the current place of residence by Age of Respondents**



Source: Tarkwa-Nsuaem Field Survey.

### 7.3.2 Duration of Stay by Place of Birth

From Table 7.2, 44 percent of respondents born in the communities where the interview was undertaken had lived there for more than 21 years. Compared to other responses, it was observed that those born in other communities within the district who had lived in the mining communities for more than 21 years were 6 percent and 1.5 percent respectively. Less than 1 percent of respondents from other regions and other countries had stayed in the various communities visited for more than 21 years. On the average, 35.5 percent had stayed in the

communities up to 10 years. The decision to stay in a place for more than 10 years can therefore be associated with the place of birth of the individual. The place of birth can therefore be considered as a factor in the choice of duration of stay in a particular community. The duration of stay is therefore important in the development of economic and social capitals which are essential in livelihood choice and sustainability.

**Table 7.2. Duration of Stay by Place of Birth**

		Place of Birth					Total
		In this town	Within district	Another district in the region	Other region	Other country	
Up to 5 years	Number	8	4	10	9	2	33
	Percentage	2.00	1.00	2.50	2.25	0.50	8.25
6-10 years	Number	13	59	9	28	0	109
	Percentage	3.25	14.75	2.25	7.00	0.00	27.25
11 - 15	Number	4	50	4	14	0	72
	Percentage	1.00	12.50	1.00	3.50	0.00	18.00
16-20	Number	1	5	0	4	0	10
	Percentage	0.25	1.25	0	1	0	2.5
21+	Number	144	24	5	3	0	176
	Percentage	36.00	6.00	1.25	0.75	0.00	44.00
Total	Number	170	142	28	58	2	400
	Percentage	42.50	35.50	7.00	14.50	0.50	100.00

Source: Tarkwa-Nsuaem Field Survey, August, 2010

#### 7.4 Migration

The attempt to understand respondents' choice to stay at a place over time was related to the issue of migration. It was realised that several factors influenced decision-making differently. In the first place, the fact that most people (i.e. 84.70 percent) tend to stay in the communities where they were born suggests that the costs of moving, both direct travel costs and the costs of locating and joining a migrant network represent important barriers to labour mobility in the municipality. The survey results indicate that migratory movements were predominantly within the same region which Ackah and Medvedev's (2010) term as "south region migration". Observation made in the municipality were in line with most studies that indicate that movements of people and the decision to remain at a particular location was influenced by work and income returns and other economic opportunities for livelihoods enhancement. Those from outside the municipality were motivated by economic factors of mining and its

associated occupation of artisanship and trading while most indigenes (84.70 percent) preferred to remain in their place of birth for the same reasons. Consequently, it was observed that internally, many local or indigenous people who drifted to mining centres were lured, in part, by employment, economic opportunities, and services that the industry offered (Nyame and Grant, 2007).

Migration has effects on children of households which are involved. According to Munro and Hardy (2007), there is a marked relationship between child development and movement of people. Whereas both sides have advantages and disadvantages, the importance of developing secured attachments in early infancy has long been recognised as an essential ingredient in normal child development and family structures (Ainsworth et al. 1978; Bowlby, 1969; Bentovim, 1991). Placement instability reduces the opportunity for children to develop permanent and secure attachments (Leathers, 2002) but also for parents who are the breadwinners of the household alike. According to Coleman (1987), placement instability therefore can lead to transitory relationships, a lack of knowledge about the past and sometimes cultural denial, all of which may amount to greater confusion and a lack of social identity. This weakens the social capital of people since trust is developed overtime and through interaction. This has serious ramification on social and economic welfare in times of shocks and vulnerability. This is believed to have influenced the choice of livelihoods of household heads in the municipality.

### **7.5 Marriage and the Choice of Livelihoods**

Marital status also influenced the choice of livelihoods. None of the spouses of males was engaged in mining as compared to 47.83 percent who were traders. It was also observed that income levels were possible determinants of the marital status of the respondents as indicated in Table 7.3. It is evident that 66.70 percent of the respondents who were married earned over GH¢150.00 per month while 65.27 percent of the respondents who were not married were in the same income level. Although the difference was marginal, it can be said that people may marry if they move out of poverty (using US\$ 1.25 per day indicator).

**Table 7.3. Marital Status by Monthly Earnings from Current Occupation**

Marital Status		Monthly Earnings from Current Occupation					Total
		Below GH¢ 50	GH¢51-100	GH¢101-150	GH¢151-200	GH¢201+	
Married	Number	6	25	54	56	115	256
	Percentage	1.50	6.25	13.50	14.00	28.75	64.00
Not Married	Number	0	15	35	28	66	144
	Percentage	0.00	3.75	8.75	7.00	16.50	36.00
Total	Number	6	40	89	84	181	400
	Percentage	1.50	10.00	22.25	21.00	45.25	100.00

Field Survey, August, 2010

All respondents who were married had their spouses engaged in some form of economic activity. This enhanced their livelihood capabilities and provided a synergy that could guarantee livelihood empowerment in times of risks and shocks.

## 7.6 Social Infrastructure

The first observation made was that economic activities influenced the kind of houses that respondents occupied. Data from the municipality indicated that mining and its effects on other activities had largely enhanced the housing structures that people lived in within the municipality. Chapter seven revealed that 52.5 percent of the household heads resided in houses constructed with cement blocks. However, all the houses were roofed with aluminium sheets. In the Tarkwa Urban Council, all the respondents lived in houses built with cement blocks, which is an indication of a higher standard of living.

It was realised that persons living in places where they were born preferred to invest in permanent housing structures than their counterparts who lived outside communities where they were born. Individuals born outside their community of residence adopted more cost saving approaches to household investments and focused more on developing assets back at their places of birth and considered their present situation as temporary.

In terms of energy usage, the study revealed that although charcoal usage was predominant among all the respondents, fuel wood usage was higher among respondents born in another town within the district (44.40 percent), those born in another district in the region constituted 35.70 percent while all household heads from other countries used fuel wood. Respondents

from other regions were observed to have the lowest proportion (i.e. 10 percent) of household that used fuel wood. Further analyses from the study revealed that majority of these respondents were among those well paid in the Municipality. A proportion of 42.90 percent of those from other regions earned above GH¢ 201 a month compared to 34.50 percent for those born in other communities within the municipality, 33.50 percent were those from other districts within the Region. On the kind of energy source to adopt for the household, issues of affordability, accessibility, availability, place of birth and the educational level of respondents were all factors that influenced these choices either individually or in combination.

With regards to choices of the water and sanitation services, similar factors concerning housing structures were observed. Occupation and income levels were the main factors that informed the choices. However, it was realised that the urban and rural dichotomy came into play on the choices of refuse disposal. Respondents in urban areas dumped their refuse in designated points where collection was easily done. Unlike the Tarkwa Urban and Nsuta Area Councils, the other area councils which were rural in nature dumped refuse in undesigned open spaces. The absence of organised refuse disposal system gives indications of what choices people would make in the absence of organised communal systems and all these have implications for livelihood sustainability.

### **7.7 Choices on the Type of Occupation**

The study revealed that 50.50 percent of the respondents and 16.18 of their spouses were dependent on mining activities, to provide them employment and income. Majority of respondents (i.e. 83.80 percent) had been directly involved in mining with 50.0 percent in the Tarkwa Urban Council, 98.30 percent, 95.0 percent, 93.30 percent and 95.0 percent in the Pepesa East, Nsuta, Nsuaem, Benso and Pepesa Area Councils respectively. The divergence in the trend from the Tarkwa Urban Council was associated with the functions it plays as the administrative capital for the Municipality. For these areas, there were other economic ventures that the urban environment provides and so there is no overdependence on mining as the major source of employment. Again, evidence from the study to corroborate this observation was the fact that in the Tarkwa Urban Council, there was a small proportion (i.e. 39.0 percent) of breadwinners dependent on mining.

The high returns from mining, evident in about 58.42 earning over GH¢201 per month, explain why most people were engaged in ASM in the municipality. The choice to move was

basically influenced by the income returns associated with the type of occupation. In Table 7.4, there were marked differences in the proportion of initial occupation of respondents compared to their current occupation. Respondents who were engaged in mining increased substantially from 22.20 percent to 50.50 percent. This was an indication of the role that mining played in the livelihood decisions or choices of respondents. However, mining is associated with uncertainties about sustainable livelihoods.

**Table 7.4. Initial and Current Occupation of Households Heads**

Type of Occupation	Initial Occupation		Current Occupation	
	Frequency	Percent	Frequency	Percent
Farming	97	24.2	108	27
Fishing	2	0.5	0	0
Civil/public service	111	27.8	20	5
Artisan	41	10.2	18	4.5
Mining	91	22.8	202	50.5
Trading	58	14.5	52	13
<b>Total</b>	<b>400</b>	<b>100</b>	<b>400</b>	<b>100</b>

Source: Tarkwa-Nsuaem Field Survey, August, 2010

The analyses revealed that the movement of the labour force to the mining sector (see Table 7.4) depict a semblance of a dual sector model. In development economics the model refers to a situation in which surplus labour from traditional agricultural sector is transferred to the modern industrial sector whose growth overtime absorbs the surplus labour, promotes industrialisation and stimulates sustained development (Lewis, 1954; Hirschmann, 1958; Martin and Mitra, 1998). In other words, the model explains the growth of developing economy in terms of the transition of labour between two different sectors; traditional and a modern sector (Jeong and Kim, 2006). The miners were attracted to the mining sector where relatively higher wages were offered. The associations made between income and the type of occupation gave an indication of the reason for movements which was in line with the dual sector model. Similarly, as per the limitations of the model such as the intensification of agriculture and migration inducing change in the occupational distribution, it was clear that this was also evident from the study. The critical implication for local development was the need to be able to harmonise traditional occupations with mining and its related occupations as in most cases, the sector tends to employ more outsiders than the indigenes because the latter lack the requisite skills to be employed in major industries. This was confirmed by all the opinion leaders interviewed during the study.

### 7.7.1 Relationship between Occupation and Age

Age emerged as one of the factors that affected household heads' choices of livelihoods in the mining communities. All respondents between the ages of 21 and 30 years were engaged in mining and the proportion decreased as the ages increased. The study revealed that only 0.91 percent of the respondents who were engaged in ASM were aged 54 years and above. Three retired ASM miners who shared their past experiences also supported the fact that it was not good to do ASM for long due to the dangers associated with the activity. They explained that the sources of danger include; the exposure to chemicals, the strenuous nature of the work, accidents and persistent harassment from law enforcement agencies. In their view, it is a good source of quick income but surprisingly, the higher the income, the higher one's expenditure due to ill health, extravagance, frequent arrests and investment in alternative livelihood sources. They gave examples of people who were able to acquire properties but had to sell them in order to pay for their health bills after retirement. Some of them even believed that there were spirits that took the money away from them.

### 7.8. Summary of Findings

It can be said from the analysis that economic endowments were as important as the social capital that characterised people's choices. Social capital in the form of family networks, education, institutional mechanisms for enhancing access to opportunities, socio-economic opportunities and services were critical issues that determined household's choices on duration of stay in a particular area, create networks and engage in economic activities. Specifically, occupation and the income returns from occupations influenced the kind of choices people made particularly, choices on their livelihood capability. Age was also a significant factor that determined the households' livelihood choices. For instance, all the household heads within the age cohort 21-30 years were engaged in mining.

Although the study confirms some findings in literature, there were differences in some circumstances indicating the dynamics and intricacies in the factors that affect livelihoods of people in a particular area. Unlike huge urban centres where social values such as education, religion, ethnicity and association may influence the choices of livelihoods, rural communities, especially communities where mining is the most lucrative occupation and sometimes the only source of economic opportunity for livelihoods, rely extensively on economic circumstances to make livelihood decisions.

Premised on the finding that mining is the most lucrative enterprise in the host communities employing more than 50 percent of the household heads, the next chapter will zero-in on the mining activities in the communities studied. The nature of mining carried out, the production chain and its contribution to the local economy are discussed in the next chapter.

# KNUST



## **CHAPTER EIGHT**

### **ARTISANAL AND SMALL-SCALE MINING OPERATIONS AND THEIR RELATED ACTIVITIES IN THE TARKWA-NSUAEM MUNICIPALITY**

Chapters seven and eight revealed that mining particularly ASM is the most significant source of economic capital to the household heads. The sector employed majority of the household heads particularly the youth. It is also the sector with the highest returns though; the actors know that the economic gains are unsustainable. As a sequel to the analyses in the previous chapters, this chapter basically focuses on ASM operations and their related activities in the municipality. The operations of the selected ASMs and their impact on livelihood was analysed in this chapter. The analyses focussed on the production chain and therefore covered not only the licensed and unlicensed ASM but also two processing companies (namely, Akoon Processing Group and Essuman Processing Company) and two licensed gold buying agencies (namely, E. Yeboah Enterprise and Campari Gold Buying Agent).

#### **8.1 Overview of ASM in the Tarkwa-Nsuaem Municipality**

The Tarkwa-Nsuaem municipality is one of the areas in Ghana with the highest concentration of ASM operations. The operations take place in or near many communities in the municipality. This situation could be attributed to the fact that the geological formations in the municipality are the mineral laden Tarkwaian and Birimian formations as already discussed in chapter six. According to the municipal office of the Minerals Commission, only 15 small scale operations are licensed while majority of them are unlicensed (galamsey) and operate on the blind side of the law. Even though they are aware of the operations of some of the galamsey activities, it is difficult for the Commission to prevent them from operating. This is due to the fact that some of them operate in old or abandoned mines or in remote areas. Although galamsey activities have given rise to concerns relating to environmental degradation, social disintegration and health and safety risks in the municipality, it is practically impossible to mount a 24 hour guard in every part of the municipality. The Municipal Office of the EPA, the Traditional Council and Assembly members interviewed alluded to the fact that they receive regular complaints about pollution of water bodies and other negative environmental practices of the ASM groups. According to the Municipal Officer of the EPA, Tarkwa, the municipal capital is located on the abandoned mines of the defunct SGMC at Tarkwa which used to operate underground. This abandoned underground

mine is made up of an intricate network of inter-connected tunnels. They are accessible through about 64 different entry points called ghettos dotted around the township. Plate 8.1 shows one of such ghettos at Bakoakhu near Tamso. This makes it possible to enter the mine at one end and resurface at an entirely different point. It is therefore very difficult to monitor or control the activities of the galamsey operators in the municipality.

**Plate 8.1. Abandoned Mine Pits Serving as Entry and Exit Points for ASM**



Source: Field Survey, January 2010

The aggressive nature of ASM activities particularly galamsey pose a significant threat to life and property. For instance, the University of Mines and Technology Basic Schools' buildings (refer to Plate 8.2) had a lot of cracks due to the underground blasting activities of galamsey operators. This has rendered the buildings unsafe. The Morning Star Hotel which is located close to the school and other houses also experienced similar problems. This led to a lot of confrontations between the owners of the properties and the law enforcement agencies. The confrontations were fuelled by their perception that the security agencies are complacent in the ASMs' use of dynamites for mining. Following numerous complaints from residents and property owners, the Municipal Assembly commissioned a committee made up of the Minerals Commission, Environmental Protection Agency, Bureau of National Investigation and the Ghana Police Service to investigate the issues. One of their notable recommendations was to seal all the openings leading to the defunct underground mine. This has not been implemented and there is no indication that it will be implemented anytime soon. All the relevant agencies contacted in the course of the study could not provide any reason for the

non-implementation of the recommendations made earlier. Meanwhile ASM activities keep on increasing in the municipality both underground and on surface (Hinton, 2005).

**Plate 8.2. Cracks on the UMAT Nursery School Block**



Source: EPA, Tarkwa, August 2010

The foregoing indicates that the ASMs in the mining communities have been largely illegal operating in abandoned pits and in remote areas rendering their monitoring very difficult. Their operations have subsequently led to severe environmental problems. The details of the operations of the licensed and unlicensed ASM are given in the subsequent sections of the chapter.

**8.2 The Activities of Selected Licensed and Unlicensed Small Scale Mining Operators**

This section of the chapter examines the background information on the selected small scale mining operations. The section also covers the recruitment and remuneration, ore processing, safety measures adopted by the companies, gender issues, other economic activities generated and the access of workers and concession owners to loan or credit. Information on the background of workers was also analysed in the section.

### 8.2.1 Background Information on the Selected Licensed and Unlicensed Small Scale Operators

The four selected small scale mining operators are: Nana Yefri Mining Group, Mohammed and Co., Dakate Company Limited and Johnson and Co. Mining Company. The other two unlicensed ASM operations are: the Asamankakraba group and the Akoon group.

#### *Nana Yefri Mining Group*

The Nana Yefri Mining Group started its operation at Nkwadum in the Nsuaem Area Council in the year 2008. The group operates in an old mine shaft that is believed to have been in existence during the colonial era. It is owned by Nana Yefri who is a traditional leader in the area and traces his ancestry to Wenchi in the Brong Ahafo region. There are various forms of leadership systems within the company. Typical among these include concession owner and gang leaders. All these types of leaders hold a share in the production output as well as certain responsibilities that affect the smooth running of the Company. The company has 25 pits with each engaging between eight and 15 people. Plate 8.3 shows some of the workers at the site. Ore extraction is usually done underground. The company does not employ women due to the nature of work at the site especially underground mining. Workers usually start work at 9.00 am and close at 5.00 pm.

The company has three departments that oversee its operations. The sections include an electrical department which is concerned with all electrical and energy issues within the company, and a pump department which is also in charge of controlling the level of underground water and ensuring that underground water is pumped out of the pit to facilitate the smooth operation of workers underground. The third department is the general office which handles general issues within the Company such as finance, security, production and other issues. All the departments are managed by personnel who have full expertise in the specific fields. The company has 30 permanent staff and over 700 tenant workers but do not operate at the site at the same time.

The group possesses an “audit system” which comprises three different audits on the site whose length was equivalent to the length of six electric poles. Various other machines and equipments are used in carrying out the daily activities on the site. Among such materials are; electricity plant, compressors, blower, water pumps, flash light and grinding machine.

**Plate 8.3. Workers at work at Nana Yefri Company**



Source: Field Survey, July 2010

*Mohammed and Co. Small Scale Mining Company*

The company began its operations in 2004 after the owner obtained a concession from the Minerals Commission. The company operates with the Effuanta Small Scale Mining Group which is licensed by the Minerals Commission. It has twenty (20) permanent workers and a number of tenant workers. The permanent workers are in charge of the administration of the company (i.e. security, finance, energy and supervision).

The company, which is located at Efuanta, mainly operates in an abandoned underground mine of the SGMC near Efuanta. It has its own processing centre. In terms of machinery used for the activities, the company has machines such as the sluice boards, transformers, crushers, smoothening machines, pumping tools and mills. Most of these machines are the “chafan” brand which are made in China. Water is pumped continuously from underground into River Bediabehe. The river has been severely polluted by the pumping of water into the pits and

washing of the ore during processing. The company has over 100 tenant workers. The tenant workers are however not all at the site at the same time since the company runs the shift system.

#### *Dakete Company Limited*

Dakete Company Limited (DCL) is a small scale mining company located at Baakoakoho near Tamso in the Tarkwa–Nsuaem Municipality. The company began its operation on July 17, 1990. Dakete mine concession is an abandoned old Gold Coast mine concession which was acquired under the Small Scale Mining Law, 1989, PNDCL 218. It used to solely operate a deep shaft gold mine using a sluice board and manual mercury gold recovery method until February 2010 when surface mining was introduced. This was attributed to the limited ore underground and the persistent flooding of pits by underground water. Another reason is the erratic nature of electricity which makes mining underground more difficult. The company currently carries out both underground and surface mining. It operates with about 54 permanent workers who are all males. The company employs between 50 and 200 contractors or tenant (who are also known as galamsey) workers at a time. The number of staff is however not fixed. Seven of the company's permanent workers work underground as technicians. The company has six departments namely: Mining; Processing; Asset Protection; Engineering; Marketing; and Health, Safety and Environment.

The tenant workers or contractors work in gangs of two and three. Ten security personnel have been employed to see to the security of the place. They work during the day and at night. Plate 8.4 shows some workers of Dakete Company Limited at work.

Due to the performance of Dakete Company Limited in the small scale mining industry, it was awarded the best small scale mining company in Ghana in 1992. Following this honour was the Dakete-Alpha merger which led to fully mechanized mining in the history of the company. Alpha was a Chinese gold mining company that came to the country with investment ideas. However, it was not sustained due to some economic hitches and the merger broke up in 1995.

Dakete Company Limited conducts periodic surface water sampling and analysis to determine the level of contamination. The Company has laid down policies and programmes that safeguard the interest of workers and their roles. These policies range from education,

health, security and other sensitive areas associated with the well being of these workers. In terms of capacity building, in-service training and other educational programmes are occasionally organised for workers within the company to upgrade their skills. Additionally, several health packages such as hospital expenses are borne by the company in times of injuries. It also provides safety materials to enable the workers unleash their full potentials required to make the company competitive.

**Plate 8.4. Workers in Operation at Dakete Small-Scale Company Limited**



Source: Field Survey, August 2010

*M/C Johnson and Co. Company*

The M/C Johnson and Co. Company is located at Bako Ekohu near Tamso. The company is owned by three Ghanaian partners. According to the workers interviewed, the small scale mining company started about ten years ago. The company has about 400 workers out of which 30 (i.e. 7.5 percent) are permanent while the rest are tenants or contractors. About 100 of the tenant workers are females whose main roles are to convey sand or the ore to the processing points. The company does both underground and surface mining. The underground mining takes place in an old SGMC mine. It has its own ore processing centres where Chanfan machines are used.

*The Akoon Group*

The Akoon Galamsey Group operates in abandoned pits which are near the Abontuako community in Tarkwa. They believe mining activities took place during the colonial era and was handed over to the SGMC. They have access to the place now because Goldfields has

stopped underground mining. They are a group of 30 men who have come together to work in these pits. According to them, the area is owned by one local person. Electricity has been connected underground. Their main problem is that because Goldfields Ghana Ltd does not operate underground, the place is usually flooded especially during the rainy season posing danger to lives and property. They however lack the requisite equipment to manage the situation. They have been in operation for about ten years. Some of the workers move to other sites and new ones also join them. The total number of workers is therefore not fixed. The group does not have its own processing machine. Individuals therefore send their ore to a processing company after it has been shared. They have their own gold buying agents that buy their gold. Sometimes the leader of the group also directs them to particular agents. Some gold buying agents also own some of the pits and therefore people who work in such pits are expected to sell the gold to them. Sometimes the workers are able to stay underground for days.

#### *The Asamankakraba Group*

The Asamankakraba group operates on the old concession of Goldfields Ghana Limited. They believe the area was mined during the colonial era and was handed over to the SGMC and then to Goldfields Ghana Limited. According to the group, the Goldfields Ghana Limited is aware of their operation on the concession. A check from the company validated this claim. Their operation, just like the Akoon group, has been made possible because Goldfields has stopped underground mining. According to the workers, the site is located near the Asamankakraba community and extends to some parts of the Prestea - Huni Valley district. They also suffer from the perennial flooding especially in the rainy seasons. The group has been in operation for over ten years. They operate in the underground caves and pits as indicated in Plate 8.5. As in the case of the Akoon group, some of the workers move to other sites and new ones also join them. The total number of workers is therefore not fixed. There are about a 100 workers at the site. Processing is also done at the site. The workers work in gangs of two to four and each gang has a leader.

**Plate 8.5. Entrance to an Underground Mine at Asamankakraba**



Source: Field Survey, August 2010

From the background information on the ASM groups covered in the study, certain issues emerged. For instance, whether licensed or unlicensed, they all operate in abandoned old mines which were either operated during the colonial era or owned by SGMC or Goldfields Ghana Limited. The licensed companies have the requisite machines that are able to pump out the underground water even in the rainy season while the unlicensed ones do not. The licensed companies have two groups of workers; the permanent workers and the tenants. The licensed companies usually employ limited number of permanent workers who are usually skilled in various areas such as administration, electrical engineering, mechanics, water pumps, security, finance and ICT. They employ large group of tenant workers who are mainly from galamsey groups. These tenant workers apply the same skills they use as illegal miners.

The unlicensed groups do not have permanent workers. There are many unlicensed small scale mining groups in the Tarkwa-Nsuaem municipality. According to the municipal office of the Minerals Commission, even though they are aware of this situation, it is very difficult to deal with such groups. This is partly due to the fact that some of them operate on the concessions of LSMs and these companies are expected to deal with the illegal miners. It also came to light from the survey that some of the mining concessions are owned by opinion leaders or people who are influential or politically connected. Some of the ASM operatives also believe in the fact that the minerals are gifts from God to their communities and therefore they have every right to it. The resources, to them are common-pool resources as

explained in the Hardin's Theory of the Tragedy of the Commons (Hardin, 1968 cited in Agyeman et al, 2012). Hence, everybody can have access to them for individual gains while the effects of their operations are borne by all. They therefore do not see the need to go through any long processes to own what has been given to their communities by nature. Some of them also asserted that leaders of various political parties recognise their existence and visit them at their sites to campaign and promise to help them when they come to power. According to them, once they recognise them during the campaign periods, they expect them to help them since they also contribute to the economy. These beliefs and their knowledge of the local environment also make it difficult to monitor and enforce compliance especially with environmental regulations.

#### *Major Stakeholders in the Operations of ASMs and Related Businesses*

From the field survey, it came to light that there were primarily four groups of stakeholders in the operations of the ASM business, particularly, the unlicensed small scale miners. These stakeholders were; sponsors, landowners, small scale miners and gold buyers. This implies that there are various groups of stakeholders who have varying interest in the business and to remain in operation, there is the need for one to ensure that the interest of each party is well protected. According to the owner of the Campari Gold Buying Agency who doubles as a sponsor and gold a buyer, there are various forms of agreements which though informal have been accepted and have become conventions. The interview with the leaders/owners of the ASM and sponsors revealed that the sponsors are rewarded based on the terms of agreement between the workers or their leaders and the sponsors. Similarly, the landowner who gives out his/her land for ASM operations is entitled to certain percentage of the proceeds based on the sort of agreement reached with the ASM worker or their leaders. The eligibility criteria for one to qualify to be a sponsor include the following:

- A minimum amount of GH ₵50,000;
- Must possess an excavator; and
- Possess a generator and fuel

According to the unlicensed ASM groups studied, the sponsors are usually local people in the communities. However it is widely believed that some Chinese investors are also sponsor. With respect to the agreements or contracts, it usually takes place in two ways, viz. verbal or written. The main challenges facing the unlicensed ASM businesses are defrauding and locked up capital during rainy seasons.

All the ASM covered indicated that, some of their sponsors were gold buyers and once an ASM is sponsored by a gold buying agent, it is expected to sell the proceeds to that sponsor. It is believed that some of these sponsors exploit the ASM miners. Some of the ASM workers however have had to deal with them due to the fact that it is difficult to access loans from the banks because of the informal nature of their operations. According to the Municipal Chief Executive, most ASM groups are usually encouraged to merge or work together in order to form very strong groups to enable them obtain approval from the Assembly in the acquisition of concessions. A typical example in the municipality is where some ASM groups have been encouraged to join the Mohammed and Co. Mining Company to form the Effuanta Small Scale mining group. It is believed that this will help them get loans from the banks and also help to reduce the level of environmental destruction. In conclusion, the availability of these stakeholders facilitates the choice of ASM as a major source of livelihood in the mining communities in the municipality.

#### 8.2.2 Recruitment of Workers and Remuneration in the ASMs

All the four licensed and two unlicensed companies had no laid down regulations for the recruitment of workers. Apart from the permanent staff of the licensed companies who were employed based on their experience and expertise, the rest were employed based on their physical strength and ability to work in an underground pit or on the surface. They are usually introduced to the site by friends or relatives who already work at a site or have ever worked at a particular site. Apart from Dakete, all the companies do not document information on their workers especially the contractors or tenant workers. In the case of Dakete, the company has started the registration of all its workers whether permanent or contractors. A detailed registration form as been prepared for this purpose and the workers are also expected to provide their passport photographs. According to the staff in charge of the ICT aspect of the company, some of the tenant workers are not happy about the registration and are therefore reluctant to fill the forms.

There are various ways of paying the different categories of workers in the companies. In all the companies, it is usually done in terms of proportions. For instance, at the Nana Yefri site, in terms of percentages, the machine owners take 30 percent of the extracted ore; the owner of the concession and compressor owners take 10 percent each while the tenant workers take 50 percent. Similar agreements exist between concession owners and the various gangs

working at the Mohammed and Co. Concession. In the company, 30 percent of the output goes to the concession owner whereas the remaining 70 percent goes to the working gangs. This simple ratio is done since the tools and the fixed assets (land) belong to the concession owners and therefore the need to get their share of the output. This has strengthened the cordial relationship between the two parties (concession owners and gang leaders) hence promoting a peaceful working environment which has direct impact on productivity within the company.

Remuneration at the Dakete company is also in proportions but slightly different from the others. The tenants are independent miners who give 1/3 of their output to the company for mining on its concession. The tenants take the remaining 2/3. They are however supposed to sell the gold proceeds from their share back to the company. This is part of the agreement made before one is contracted to work on the concession. The gold is measured in blades. One blade costs GH¢40 at the site while it is sold for GH ¢60 in town. The tenant workers are supposed to sell the ore to the company at the reduced price since the cost of processing is borne by the company. With M/C Johnson, the tenant miners give 1/3 of their output to the company for mining on its concession while they take the remaining 2/3. Unlike their counterparts at Dakate Company Ltd, they have the option to either sell it back to the company or outside. In the case of the two unlicensed companies, payment is done based on the agreement between the workers and the owners. In their case, whatever amount of ore obtained is divided into ten. The concession owners take two portions and the workers take eight portions.

In all the companies, no cash payment is made to the workers. Payment depends on the amount of ore that is produced by a worker or groups of workers (gangs) and the proportional arrangement between the workers and the concession owners. The transactions are based on trust. Cash is however exchanged when the workers sell their ore to the company.

### 8.2.3 Ore Processing and Safety Measures Adopted by the Small Scale Mining Companies

All the companies, except the Akoon group process their ore and have the requisite machines such as Chanfan for crushing and milling. Plate 8.6 shows some workers processing ore at the Asamankakraba site. At the Nana Yefri site however, it was observed that the ore is pounded in a metal mortar with a metal pestle for testing as shown in Plate 8.7. None of the mining companies refine gold at the site. Even though all the permanent staff and 30 percent

of the tenant workers attested to the fact that they know about the Mercury Abatement Project and have received some education on Mercury Retorts through some staff of the UMAT, they are yet to adopt it. The experts interviewed at the UMAT revealed that the university in collaboration with the European Union (EU), GIZ and the Chamber of Mines offers technical assistance to the ASM sector. Most of the ASM groups value their assistance and are willing to be given guidelines for their operations. However, few enlightened ones usually think they could carry out their operations on their own and as a result do not consult the institution for any assistance in terms of new and efficient mining methods, guidelines for operation and some mining ethics which are essential necessities for successful mining operations. It is important however to note that consultation is done at a cost. Consultancy services are mostly delivered in the form of short courses both for junior and senior levels.

**Plate 8.6. Ore Processing at the Asamankakraba Site**



Source: Field Survey, August 2010

**Plate 8.7. Workers Pounding Ore using a Metal Mortar and Pestle at the Nana Yefri Site**



Source: Field Survey, July 2010

*Safety Measures Adopted by the Small Scale Mining Companies*

All the six mining companies adopted safety and security measures to ensure the well-being of the workers. The management of the Nana Yefri Company has adopted safety and security measures to help create a safe and conducive working environment. Firstly, 12 private security personnel have been employed at the site to help ensure that properties of the entire company as well as individual workers are secured. Again, they ensure that all forms of smuggling of gold from the sites by some unscrupulous workers are checked or prevented to help ensure stable production pattern within the Company.

Dakete Company Limited is one of the small-scale mining companies within the Tarkwa-Nsuaem Municipality which has laid down policies and programmes that safeguard the interests of workers and the roles they play in the company. These policies range from education, health, security and other sensitive areas associated with the wellbeing of the workers. In terms of education, in-service training and other educational activities are occasionally organised for workers within the company to aid in upgrading their skills.

Private security personnel have been employed at the site of Mohammed and Co. and M/C Johnson to help ensure that properties of the companies as well as individual workers are safe. Again, they ensure that all forms of smuggling of gold from the site by some unscrupulous workers are checked or prevented to guarantee a stable production pattern within the Company. It was observed however that safety or protective outfits such as helmets, nose masks, industrial eye glasses, boots and gloves are not used by the workers and according to the workers, the companies do not provide them with such outfits. As a result, the management of the companies do not insist on the use of such outfits. As shown in Plate 7.7, some of the workers even work at the sites barefooted. The majority of workers however wear rubber sandals and use flash lights underground.

In all the companies, the workers are not expected to take alcohol while at work. It is an offence to fight at the sites. At the Asamankakraba site, the owner has engaged the services of security men. The Akoon group however has no security personnel at the site.

#### 8.2.4 The Role of Women in ASM

It was observed from the various companies that there was no female permanent worker involved directly in the extraction of ore. None of the sites studied is owned by a female. Again, no female goes underground. This is attributed to the nature of the ASM work which requires a lot of energy and courage which is presumed to be absent in women. According to Hruschka and Echavarría (2011), though women play key roles in ASM, mining in general is seen as an essentially masculine endeavour. All the male respondents at the studied ASMs do not see how women could work underground and would not even encourage it. This could be attributed to cultural perceptions and traditional beliefs about the roles of women in general. Some of these cultural beliefs give room for discrimination against women and prevent them from playing key roles in the ASM. In the view of Chambers (2008), attitudes and behaviours which are dominating and discriminating in every community are more common among the powerful and most often, the more powerful individuals are men. Discriminatory cultural practices and beliefs push women into marginal and less secured forms of work in ASM.

Women consequently get poorly paid jobs in ASM with little scope for career improvement. In all the six ASM covered in the study, the women mainly operate as casual workers who convey the gold bearing sand or stones to the milling centres. They carry heavy loads of sand for hours for a meagre income of GH¢1.50 per head pan. They are paid based on the number

of pans of ore that they convey in a day. It must be emphasised that though men ore head porters would have been paid the same amount as the women take, the roles they play in the ASM industry put them in a different category. Men who carry the ore are tagged as lazy and for this reason, the study identified that none of the head porters was male.

Women have survived in the ASM sector under difficult conditions over the years. At the Dakete processing and Mohammed and Co sites for instance, some women were involved in the ore crushing and panning processes. Women also operate as food vendors near or at the various sites. According to the food vendors, they gained access to the various companies through their social networks. Some are the wives, relatives or friends of workers or concession owners. They mainly sell fufu, rice, ampesi, banku, bread, meat pie, fruits, water and other drinks. The food vendors operate from morning to evening. The study identified that the least amount an individual can spend on food was GH¢1 a day. All the women also attested to the fact that most of the workers prefer heavy meals such as banku and rice early in the morning before they go underground. Various modes of payment arrangements are made by the individual workers and the food vendors. The management of all the companies are not directly involved in such arrangements. In the view of all the food vendors interviewed at the various sites, they play a vital role in the ASM process. Unlike the large scale mining companies, none of the small scale companies covered provide meals for their workers and since some of the sites are in remote areas the women help save the workers from walking long distances in search of food.

It was observed that some of the food vendors and the women who conveyed the gold bearing sand or stones to the processing centres take their young child or toddlers to the sites as shown in Plate 8.8. The ASM environment is however not safe for children who may be at the risk of falling into an uncovered pit, getting injured and exposed to excessive dust, chemical and noise pollution.

**Plate 8.8. The Presence of a Young Child at the Asamankakraba ASM Site**



Source: Field Survey, July, 2010

The study identified that none of the mining sites engaged people aged below 18 years. The women interviewed indicated their willingness to be directly involved in ASM activities or even become concession owners but according to them, they lack the capital to enable them get their own concessions. They are also discouraged from getting involved directly in ore extraction due to cultural beliefs and the perception that it is the preserve of men. Despite the discriminatory nature of the beliefs and practices at the mining sites, women like their men counterparts contribute immensely in the ASM sector and an understanding and acceptance of their productive labour in all areas of ASM is important for the development of host communities. According to Styles et al (2006), there are Women's Mines Associations and networks in some African countries such as Tanzania, Zambia and South Africa that champion the involvement of women in mining. There are no such associations or networks in any of the studied ASMs and no such association exists in the Municipality or the nation. The recently formed Small Scale Miners Association is also dominated by men.

#### 8.2.5 Other Economic Activities Generated by the Small Scale Mining Companies

Apart from food vending, other economic activities have been generated by the activities of the small scale mining companies. For instance, at the Nana Yefri concession, due to the

distance from the site to the nearest largest community, a taxi station has been created a few metres away from the site. A drinking spot is also located close to the taxi station. This is in spite of the fact that the management said drinking and smoking were not allowed at the site. It was discovered that some of the workers do what is known as ‘drink/smoke and carry’.

Additionally, due to extensive clearing of the forest or vegetation, charcoal burning is also actively done close to the site as indicated in Plate 8.9. According to the Municipal offices of the Ghana Private Road Transport Union (GPRTU) and the Metro Mass Transport, ASM activities have also facilitated their work. Many people move to the municipality in search of job and also some move from one place to the other either within the municipality or to other parts of the region and country regularly. Again, most of the equipment and other goods and services used by the ASM miners are brought into the municipality by traders from Kumasi, Accra and Takoradi. Most of these goods are transported through the GPRTU vehicles and Metro Mass Transport Service and this has helped to keep these transport businesses which employ a lot of people in business. For instance four Metro Mass buses leave Tarkwa each morning before 7.00a.m. and the same number leave Kumasi for Tarkwa in a day. GPRTU vehicles also ply the same route 24 hours a day and most of their passengers are mainly traders.

It was also observed that various groups of traders do a lot of business at the various companies. For example, clothing, drugs and domestic items such as radio, sound systems, cooking utensils and other items are also hawked at the sites. Various shops have also been set up to sell items that are mainly used by the workers such as rubber pans, rubber sandals, flash lights, sacks and other items used by the ASM workers in nearby communities.

### Plate 8.9. Charcoal Burning Activities Near Nana Yefri Mining Concession



Source: Field Survey, July 2010

#### 8.2.6 Access to Loans

There are many financial institutions in the municipality but access to loans by individuals and companies involved in ASM remains difficult. This was confirmed by the financial institutions contacted such as Ghana Commercial Bank, Ahantaman Rural Bank, Fiaseman Rural Bank, Barclays Bank and First National Bank. Apart from the Ahantaman Rural Bank which indicated that it had given loans to a licensed ASM company once, all the others have not given loans to any ASM company or individuals to operate ASMs. They however indicated that they give loans to individuals as clients. According to Styles et al (2006), most of the local banks are not conversant with the concept of realistic micro-credit or finance for the ASM sector. They are also unwilling to provide soft loans for ASM ventures for fear of being seen to be legalising the unlicensed ASM.

Lack of adequate capital in the ASM sector is a major problem in the municipality and all the respondents indicated that they would want the government to assist them financially through loans. It was observed from the field study that some of the ASM groups especially the illegal ones are not happy about the remuneration arrangement with the sponsors or concessionaires. Some of them are also not happy about the fact that they had to sell their gold to their sponsors. Styles et al (2006) opined that the lack of appropriate pre-financing mechanisms or appropriate micro-credit schemes has resulted in many ASM miners having to resort to

seeking credit from many ‘predatory’ sponsors that take advantage of the situation. This makes the miners vulnerable since some of them find themselves in debt-bondage situations where they work endlessly for such sponsors. In the focus group discussions with the workers at the various sites especially at the unlicensed companies, it came to light that they were given promises of help by leaders of political parties during election periods but these promises were not fulfilled when they came to power.

### 8.2.7 Background of Workers of the Selected Small Scale Mining Companies

A total number of 110 workers (80 from the four licensed ASM companies and 30 from the two unlicensed companies) were covered.

#### *Ages of ASM Workers*

The ages of the respondents of both the licensed and unlicensed companies were analysed in this section of the study. The ages of respondents in the licensed ASM range between 18 and 54+ years as indicated in Table 8.1. The analysis of the data revealed that 63.75 percent of the workers were within the age range of 18-35.

**Table 8.1. Age of ASM workers**

Age Cohort	Nana Yefri Company		Mohammed and Co.		Dakete Company Ltd		Johnson and Co.		Total Respondents	
	Respondents		Respondents		Respondents		Respondents		Respondents	
	No	Percent	No	Percent	No	Percent	No	Percent	No	Percent
18-23	4	5.00	2	2.50	1	1.25	2	2.50	9	11.25
24-29	5	6.25	4	5.00	4	5	6	7.50	19	23.75
30-35	6	7.50	6	7.50	5	6.25	6	7.50	23	28.75
36-41	2	2.50	4	5.00	5	6.25	4	5.00	15	18.75
42-47	2	2.50	3	3.75	3	3.75	1	1.25	9	11.25
48-53	1	1.25	1	1.25	1	1.25	1	1.25	4	5
54+	0	0.00	0	0.00	1	1.25	0	0.00	1	1.25
<b>Total</b>	<b>20</b>	<b>25.00</b>	<b>20</b>	<b>25.00</b>	<b>20</b>	<b>25</b>	<b>20</b>	<b>25.00</b>	<b>80</b>	<b>100</b>

Source: Field Survey, July, 2010

The ages of respondents of the unlicensed ASM range between 18 and 53 years as indicated in Table 8.2. Majority of the respondents (63.33%) were within the age range of 18-35.

**Table 8.2. Age of Respondents of the Unlicensed Companies**

Age Cohort	Akoon Small	Asamankakraba	Total	
	Scale Group	Group	Number	Percent
18-23	2	2	4	13.33
24-29	4	3	7	23.33
30-35	4	4	8	26.67
36-41	2	2	4	13.33
42-47	2	3	5	16.67
48-53	1	1	2	6.67
<b>Total</b>	<b>15</b>	<b>15</b>	<b>30</b>	<b>100.00</b>

Source: Field Survey, July, 2010

From Table 8.3, 63.6 percent of the respondents in both the licensed and unlicensed companies were within the age range of 18-35. There is no marked difference in the ages of majority of people who worked in both the licensed and unlicensed companies. ASM is an important source of livelihood for many young people in the Tarkwa-Nsuaem Municipality. This confirms Hruschka and Cristina' (2011) assertion that a large number of young people resort to ASM as a means of survival. ASM mining is an economic activity that is labour intensive and is associated with low per capita productivity, employs unsophisticated technology and requires relatively low capital investment (Economic Commission for Africa, 2002) and therefore require strength and local expertise to undertake.

ASM is a major economic activity that pulls young people to host communities in the municipality. For many young people who live in remote mineral rich communities, their first experience in mainstream employment is in ASM. Many factors have contributed to the high proportion of young people in ASM. Some of these factors are poor education and limited skills as detailed in chapter seven.

**Table 8.3. Age of Respondents in the Selected ASMs**

Age Cohort	Respondents	
	Number	Percentage
18-23	13	11.82
24-29	26	23.64
30-35	31	28.18
36-41	19	17.27
42-47	14	12.73
48-53	6	5.45
54+	1	0.91
<b>Total</b>	<b>110</b>	<b>100</b>

Source: Field Survey, July, 2010

Some of the youth are also simply lured to work in the ASM sector by the prospect of becoming rich quickly. Plate 8.10 shows some of the youth at some of the Nana Yefri Mining Company.

**Plate 8.10. Young ASM Miners at the Nana Yefri Mining Company**



Source: Field Survey, July 2010

### *Educational Background of the Workers of the ASM*

The results indicated that 58 percent of the workers had formal education. Only 10 percent had no formal education. In addition to the above, the proportion of the workers who had attained secondary education was 22 percent. The limited educational level of the miners explains their inability to be appointed to positions in the LSM as discussed under chapter seven. The Traditional Council observed this as a grave limitation to the LSMs' role in local economic development. The remaining 10 percent had attained tertiary education. The workers with tertiary educational background occupied the managerial and administrative positions and were in charge of electricity supply and equipment in the ASM.

### *Marital Status of the Workers of the ASM*

In terms of the marital status of the respondents, 75 percent of the workers were married while the remaining 25 percent were single. Of the 75 percent who were married 45 percent had their spouses living with them in the mining communities while the rest had their spouses staying in Tarkwa, Takoradi and the home towns of the respondents. The marital status of the workers and more importantly those living with their spouses in the mining host communities enhance the formation of social and economic capital as discussed in chapter seven. The single household heads and household heads with their spouses living outside the mining communities engender the promiscuous acts observed in the mining communities as identified in the literature.

### *Place of Origin*

In terms of the place of origin of the respondents, 90 percent do not come from the mine host communities as indicated in Table 8.4. Majority, (i.e. 54.55 percent) of the respondents however come from the Western region. Of this, the Wassala people who are the natives of the area constituted 23.64 percent while Ahantasi and Nzemas accounted for 30.91 percent of the total working population of the ASM. The remaining 45.45 percent originated from other regions of Ghana such as; Central, Ashanti, Volta and Northern region. Majority, that is, 65.45 percent of all respondents were born in the municipality while the remaining 34.5 percent migrated to the place. According to the leaders of the companies, ethnicity is not considered as a factor for employment in the companies. The doors of the companies are opened to all irrespective of one's ethnic origin. Those who are not natives but were born in the municipality indicated that their parents migrated to the area to work as miners, traders or farmers.

**Table 8.4. Place of Origin of Respondents**

Place of origin	Respondents	
	Number	Percentage
Mine Host Community	11	10.00
Other communities within Municipality	15	13.64
Other Districts in the Western Region.	34	30.91
Other Regions in Ghana	50	45.45
<b>Total</b>	<b>110</b>	<b>100.00</b>

Source: Field Survey July, 2010

There is both inter and intra regional migration in the region. The rate of intra–regional migration of ASM miners within the region is however high. The implication of this is that decisions to migrate or to stay at a particular location are influenced by the inter-regional and intra-regional inequalities in geographical space and this becomes either the pull factor or push factor of migration. Zimmerman and Bauer (2002) argue that each potential migrant calculates the present discounted value of expected returns in all potential regions and migrate if the returns from a potential destination region minus the costs of migration are larger than the returns from staying at the location of origin. In other words, a potential migrant finally moves if he/she believes that the economic endowments of the destination can enhance his/her living conditions. Hence, a person who decides to migrate or extend his residence based on the perceived differences in the economic potential and returns between the origin and destination using such indicators as employment and income returns. Similar models have been articulated by Harris and Todaro (1970) who argue from the developing world perspective. According to them, wage differentials between the rural and urban, developed and developing economies, or core and periphery sectors and the probability of finding a job are the key factors that determine movements or in other words, duration of stay in a particular area. Based on the models put forward by Harris and Todaro (1970) and Zimmerman and Bauer (2002), it can be said that the mineral endowment of the municipality are among the factors influencing people’s choice to stay in the municipality as mining and its related occupations are characterised by high incomes and presents better alternatives for economic empowerment than the economic potentials of other areas in the Western Region and even the country.

### *Reasons for the Choice of Job*

The respondents gave various reasons for their choice of jobs as indicated in Table 8.5. A careful analysis of the responses brings economic reasons to the fore.

**Table 8.5. Reasons for Choice of Mining as Source of Economic Livelihood**

<b>Reason for Working in the Mines</b>	<b>Number</b>	<b>Percentage</b>
The need to earn income to support family	30	27.27
Inability to get a job after a long search	20	18.18
To help raise money to start a business	25	22.73
To help pay for the cost of education	10	9.09
Simply to make a living	15	13.64
Lost a job and must earn a living.	10	9.09
<b>Total</b>	<b>110</b>	<b>100.00</b>

Source: Field Survey July, 2010

Chapter seven indicated that households in the mining communities consider ASM and mining in general as a quick means of acquiring economic capital for a living. These responses support the fact that many people migrate to mineral rich communities in the hope of escaping poverty and enhancing their ability to cater for their basic needs and that of their dependants. Premised on the economic potentials of mining evident in the “quickest returns”, 22.7 percent of the workers considered the sector as a means to achieving a sustainable source of livelihood.

### *Years Spent on the ASM Job*

The number of years the workers had spent working on the job varied. While 15.45 percent indicated that they started with their respective companies, 30 percent said they had spent more than two years in the same company. Majority of respondents (54.5 percent) said they had spent less than two years in the same company. This situation could be attributed to the fact that there is no binding agreement between employers and employees on the number of years that one could work in or leave a particular company. However, 45 percent of respondents indicated that they had been mining in different small scale mining companies for more than 10 years. This is in line with Styles et al (2006) assertion that many of the small-scale miners exhibit nomadic characteristics and flock to mineral rich areas where

terms and conditions are favourable. However, 86 percent of the workers indicated that they do not intend to make it a permanent job. They were only in the job in order to raise money to establish their own businesses such as; transport, boutique, and mechanic shops or own their own concessions. On the other hand, four percent indicated that they do not intend to do any other job. The remaining 10 percent indicated that they would want to further their education.

#### *Amount of Money Earned Per Week*

The respondents indicated that the amount of money they earned in a week was not fixed. Sometimes the business was good while it was simply bad in other times. It all depended on the quality of ore one obtained and the quantity that the group was able to carry to the site from underground. It also depended on the level of water underground as well as the international price of gold. In spite of all the above, 43 percent of the respondents indicated that they could earn at least GH¢ 200 per week. While 22 percent said they earned more than GH¢ 200, the remaining 35 percent indicated that they earned less.

#### *Expenditure*

All the respondents indicated that they spend mainly on food, rent, education, health and transportation. It can be said that the ASM workers mainly spend on their basic needs. This is supported by Hentschel et al. (2002) that small-scale mining can generate significant local purchasing power and lead to a demand for locally produced goods and services such as food, tools, equipment and housing. About 15 percent of the respondents who were young however indicated that they spent some of their income on entertainment and on their girlfriends. According to them, entertainment is very important in view of the dangerous nature of their work.

#### *Savings*

On savings, 80 percent said they save in the various banks at both Tarkwa and Takoradi and with the rural banks in the host communities. Some (15 percent) however saved with Susu collectors. It was difficult for the workers to tell exactly how much they saved per week or month since they did not have fixed times for depositing money into their accounts. Some of the workers, 10 percent were simply not prepared to reveal their savings. Those who were able to say how much they saved indicated that they saved between GH¢10 and GH¢50 per week on the average. The remaining 5 percent indicated that they do not save with any

financial institution because what they earned could not meet their expenditure. While 40 percent indicated that they owned assets such as buildings and vehicles, the others did not have any capital assets.

#### *Challenges Faced by Respondents on the Job*

The respondents have a lot of challenges especially with regard to health. The lack of protective clothing exposes the miners to a lot of health challenges such as excessive exposure to dust and chemical pollution. Most of the host communities do not have health facilities and this makes the workers vulnerable when accidents occur. Whenever accidents occur or a worker falls sick at work, the people involved are rushed to a nearby health facility or the house for urgent attention. This sometimes distorts working hours as concerned gangs have to put all activities to a halt and carry their co-workers to places where medical facilities are available. However, according to the office of the Municipal Public Health section of the Municipal Health Service, the small scale miners are regularly educated on the health consequences of their activities. This is usually done with the assistance of the Assembly members and the traditional authorities. The small scale miners however have paid little attention to them.

Environmental conditions at the sites of the various ASM groups are not good. There are no washrooms or changing rooms for workers at the various mining sites of the selected companies. They only have sheds made of bamboo, logs and palm fronds. Some of the sites are littered with metal scrap and old machine parts. Power fluctuations usually affect their operations underground in many ways. It leads to flooding underground and poor or no ventilation. The workers' source of lighting underground is flashlight and this is inadequate.

### **8.3 Gold Processing Groups**

This section examines the operations of the two selected gold processing groups in the municipality. They are; the Essuman gold processing group which is located at Nsuaem and the Akoon gold processing group located at Abotuako along the Tarkwa-Bogoso road. These are independent processing groups whose main role in the ASM sector is to process the ore of small scale mining groups which do not have their own processing plants. Many of the equipment and techniques used for processing and mineral dressing are crude.

### 8.3.1 Essuman Gold Processing Group

Essuman Gold Processing Company is located near the main Takoradi-Tarkwa road at Nsuaem. The group has been in operation since 1997 and has enjoyed some level of success in production. The processing company is in a residential area as shown in Plate 8.11.

**Plate 8.11 Essuman Gold Processing Group in a Residential Area**



Source: Field Survey, August 2010

The Company had 10 permanent workers who were involved in the supervision of various activities such as crushing and grinding of stones, washing of the ore and gold amalgamation within the company. The ages of workers within the company ranged from 18 to 50 years. Although some of the workers also looked much younger than 18 years, (as shown in Plate 8.12) they insisted they were older. Owners of the ore have the option of directly processing their goods. Most of the miners preferred this kind of arrangement because it was more transparent.

The company saves with the Ahantaman Rural Bank. The bank has assisted the company with loans to purchase new and good quality equipment and materials for its operation. Some of the workers of the company also save with the bank. Majority of the workers save with the same bank.

**Plate 8.12. Workers in Operation the Processing Site**



Source: Field Survey, August 2010

Various types of equipment and tools were used in the ore processing activities. Among the identified equipment and tools used were crushers, sluice boards, shovels, sacks, basins, blanket, mercury and basins. Ore processing involves a systematic process of off-loading of stones into a crusher, crushing and smoothening, washing of crushed and smoothened ore and washing of blanket in water. The other stages are panning of obtained gold particles and addition of mercury and amalgamation.

The jaw crushers and hammer mills act as primary crushers. Plate 8.13 shows workers off-loading ore into a crusher. Disc mills are also used for secondary crushing. The crushing machine (crusher) is used to break the stones into smaller particles. This process makes it possible for the milling machine to break the particles into the smallest form. The smoothening machine is then used to mill the semi-final particles to a state that could be easy to be washed on the washing board or sluice.

At the concentration stage, sluice boxes or boards are used (ref. Figure 8.14). The boxes are locally made with hard wood or iron sheets. The sluice boxes or boards are lined with blanket, towel or carpet. It is believed that smaller particles of gold settle on these linings.

**Plate 8.13. Off-loading of Ore Processing**



Source: Field Survey, July 2010

After sluicing, gold concentrates which have a characteristic black colour is cleaned in rubber pans which are cut from rubber sheets as shown in Plate 8.15. Mercury is then mixed with the black sand (the gold concentrate). The gold particles which have strong affinity for mercury adhere to it to form a pasty, dough-like amalgam. At this stage, the gold is separated from the black sand. Acid is used when the purity of the gold is not to perfection. These processes make the gold pure since impurities such as lead, sand, etc are removed. It was observed that the workers keep smaller bottles of mercury and use it freely without any protection. They claim it is not harmful. In the view of Styles (2006), mercury is used carelessly by the ASM groups.

**Plate 8.14. Sluicing and Washing**



Source: Field Survey, July 2010

ASM groups usually use amalgamation as the final extraction process. In most cases, amalgamation is done by rubbing the mercury into the concentrate with their bare hands as shown in Plate 8.15. This process exposes the workers and communities to a lot of problems such as acute mercury poisoning, silicosis, neurological and kidney damage, cardiovascular and respiratory dysfunctions (Hinton et al, 2003). Even though the workers are aware of the mercury retort, they do not use it. To them, it is expensive and uncommon as compared to mercury which is cheap, easily accessible and quick to use.

According to the Blacksmith Institute (2011), artisanal gold mining is one of the most significant sources of mercury release into the environment in the developing world. ASM gold miners combine mercury with gold-carrying silt to form a hardened amalgam that has picked up most of the gold metal from the silt.

**Plate 8.15. Gold Amalgamations in a Washing Basin**



Source: Field Survey, July 2010

The amalgam is later heated with blowtorches or over an open flame to evaporate the mercury, leaving small gold pieces. The gaseous mercury is inhaled by the miners and often by their immediate family, including their children. The mercury which is not inhaled during the combustion process settles into the surrounding environment or circulates globally for future deposition far from the site where it is absorbed and processed by various living organisms. This transforms elemental mercury into methyl mercury which is one of the most

dangerous neurotoxins that contaminate the food chain through bioaccumulation. According to Styles et al (2010), though mercury is one of the chemicals mostly used in the field of extraction of gold, it is highly dangerous to the health and other aspects of human livelihood. Consequently, several educational workshops and seminars are mostly held for mining companies and groups in operation under the Mercury Abatement Project to help equip them with the best skills in the handling and usage of dangerous chemicals like mercury. However, like the ASM groups that process their ore, they do not use the retort glass even though they know about it. They explained that they are more comfortable with their old technology and believe it is faster.

UNIDO estimates that mercury amalgamation from this kind of gold mining results in the release of an estimated 1000 tons of mercury per year. As much as 95 percent of all mercury used in artisanal gold mining is released into the environment, constituting a danger on all fronts – economic, environmental and human health (Blacksmith Institute, 2011)

It is obvious from the responses of the workers that they do not know much about the harmful effects of mercury. This is in line with the observation made by Spiegel and Veiga (2005) that ASM activities are usually undertaken by workers with limited understanding of the long-term impact of their activities on the environment and on their health. The Mercury Law, PNDC Law 217 of 1989 allows ASMs to purchase mercury from licensed mercury dealers. It however only stipulates in Section 4 (2) that small scale miners shall observe good mining practices in the use of mercury. It does not define what constitutes good mining practices in the use of the chemical. It does not also have guidelines for storage, handling and the use of mercury. This leaves the mode of handling and disposal of the chemical to the discretion of the user. The absence of clear guidelines makes compliance monitoring difficult (Amegbey and Eshun, 2003).

### *Expenditure*

Various materials and equipment were used in the various stages of ore processing by the mining companies. The Essuman Gold Processing Group Company makes use of materials and equipment ranging from large equipment such as crushers, smoothening machine, sluice boards, shovels, plastic basins and bashers. Table 7.5 shows the estimated cost of the tools used by the company.

**Table 8.6. Cost of Tools used by the Company**

<b>Tools</b>	<b>Quantity</b>	<b>Unit Price (GH¢)</b>	<b>Total cost (GH¢)</b>
Motor	2	5 00	1 000
Crusher	2	5 00	1000
Shed (machine site and washing base)	1	10 000	10 000
Washing board	6	80	480
Shovel	6	50	300
Basins	15	4	60
Smoothing machine	2	5 00	1000
Basher	3	15	45

Source: Field Survey, 2010

### *Processing Fee Arrangements*

A processing fee is fixed based on a mutual agreement between the owner of the company and the miner. Like what is practiced at the mining sites, cash is usually not exchanged. Payment is based on proportions. If 10 sacks of ore are presented for processing, the owner of the company takes two sacks of the ore while the miner takes the rest before the processing takes place. The owner of the company also usually buys the processed gold from the miners.

### *Safety and Security Measures*

With respect to safety issues within the company, various means are devised to ensure that the safety of workers is guaranteed. The company encourages the workers to use various safety equipment and tools such as gloves, goggles and nose masks to safeguard their health. However, it was observed that most of the workers do not use these protective materials as evident in Plates 8.12 to 8.15. The crushing of the ore generates a lot of dust and noise but most of the workers move through them unprotected. A curative measure such as drinking of soda water is usually recommended for workers suffering from dust pollution. In terms of security, one security personnel has been employed to ensure that the Company's properties are in safe hands. This underscores the mining-related diseases the households reported in chapter seven. The miners indicated that they are not comfortable in the protective gears as they slow them down.

### *Production*

The field survey revealed that the company in recent times has experienced a stable production pattern. Nevertheless, it sometimes records a very low level of gold production that is mainly attributed to the continuous fall in the quantity of loads of ore processed. As a

result of this, the company sometimes records as low as a pound or two of gold for a week's work carried out whereas on good days, as high as eight pounds of gold are recorded. Again, inferences from the views shared on production pattern recorded that, the average gold production per week is six pounds. Several measures have been put in place such as good working environment, cordial relation with tenant workers and advertisement of the company's operation among various gangs, to help ensure that the production pattern within the company improves to an appreciable level.

### 8.3.2 The Akoon Gold Processing Group.

The Akoon Gold Processing Group is located at Abontuako, 30 meters away from the Tarkwa-Bogoso road. It is an independent processing group that is not linked to any small scale mining group or company. It receives ore from various ASM groups particularly the galamsey groups in and around Tarkwa. It possesses all the machines used for processing. Ore is transported to the place through various means. It is transported by vehicles which offload the sacks of stones by the roadside which is later transported to the processing center either by the ore owners or workers on trucks.

Their method of processing and payment is similar to those at the Essuman gold processing company. The company has more than 10 permanent workers who perform various roles from the loading of the crushers to the amalgamation of the mineral. Like what pertains at the Essuman processing group, the miners also prefer to do the processing themselves. The terms of payment are similar to that of the Essuman Company.

### **8.4 Licensed Buying Agents**

The proliferation of both legal and illegal small-scale mining companies within the Tarkwa-Nsuaem Municipality has given rise to the establishment of Local Buying Agencies (LBAs) within the area. These LBAs have helped to reduce the problems associated with the availability of ready market for the refined gold of most ASM operators. As part of the regularisation process of the Small-Scale sector, the Precious Minerals Marketing Corporation Law (PNDC Law 219) of 1989, created an avenue for the ASMs to sell their products to the PMMC which later became the Precious Minerals Marketing Corporation Ltd through an Act of Parliament in 2000. The gold buying agencies are expected to work closely with the PMMC. For instance, when an agency gets registered with PMMC, it is expected to supply at least 500 grams of gold every month. According to an officer at the PMMC Office

in Tarkwa, it is difficult to get the LBAs to sell gold to them due to the presence of Lebanese and Indian gold buyers who buy the gold directly from the LBAs. Other foreign gold buyers who are licensed by the Minerals Commission also compete with the PMMC in the purchase of gold from the LBAs. All these factors have contributed to the decrease in the amount of gold purchased by the PMMC. The PMMC used to buy 15 kilograms of gold from the LBAs per week but with the influx of foreigners into the gold buying business, PMMC is not able to buy the targeted 15Kg of gold per month. This situation prevails in spite of the fact that if an LBA is unable to supply gold to the PMMC for a period of three months, that particular LBA is withdrawn from PMMC. It is important also to note that the valid period of the license is one year. LBAs are supposed to pay an application fee of GH¢200 and a renewal cost of GH¢60.

There are about 10 licensed gold buyers and 40 sub-agents in Tarkwa. There is an association of small scale gold buyers in the municipality. The association was formed in the year 2000. The association is known as the Purchasing Cooperatives. Its ultimate aim is to safeguard the welfare of every individual and agency which has legally invested in such a venture to help revamp the small-scale gold mining sector within the municipality and the country as a whole. The association sometimes embarks on development projects within the municipality towards the wellbeing of the people. For instance, the Cooperative has built a washroom for the municipal police headquarters to help improve the sanitary condition of the police who are in charge of security in the municipality. The LBAs pay taxes such as GH¢300 to the Municipal Assembly and GH¢25 every quarter to the IRS.

#### 8.4.1. E. Yeboah Gold Buying Enterprise

The E. Yeboah Gold Buying Enterprise is legally registered and has been operating under a license issued by the PMMC for the past 15 years. The main function of this enterprise is to buy gold and sell it to PMMC and other licensed agencies. The enterprise is a member of the Purchasing Cooperatives.

#### *Production and Employment*

The enterprise buys gold from any small scale mining groups within and outside Tarkwa. It has four permanent employees with an average age of 30 years. All the permanent workers are males. Their main roles are to take records of the stock of the enterprise and to assess the genuineness of the gold that clients bring to their enterprise before they are weighed. This is

done to avoid the purchase of fake gold. The Enterprise has its own refinery and chemicals where all these checks are done. The workers also help to promote the business by getting customers for the Enterprise. Cheating of customers in any form is not entertained.

According to the owner of the Enterprise, the daily stock of the enterprise ranges from 400-500 grams which cost approximately GH¢30,000. Payment for such recorded stock is made in cash, implying that a huge sum of money is required for an individual or organisation to be in such a business. In terms of the nature of gold bought, the enterprise is into the purchase of partially refined or already refined gold. According to the owner of the enterprise, the miners usually come in groups believed to be the gang members to sell the 'goods'. Individuals also sell gold to the enterprise. The price per ounce or gram of gold is determined by the prevailing global gold price at the very minute of the sale of the gold. The miners check on that before they get to the office of the buying agent. They together with the agent or his assistants check on the world market price of gold on television channels such as the Cable News Network (CNN), British Broadcasting Corporation (BBC) or Aljazeera before the final transaction is made. This supports the fact that most of the miners in the artisanal and small scale sector are literate.

### *Savings*

From the interviews with the staff of the enterprise, it came to light that savings among ASM operators is very low and therefore they easily go bankrupt over a shorter period of time as compared to gold buying operators. This difference was attributed to the fact that most ASM operators, particularly the galasmey operators hold the belief that they can easily lay hands on money due to the continuous existence of the mineral. According to the workers of the Enterprise, the gang members usually share the cash at the premise of the enterprise before they leave. Gold buying agencies consider the availability of money for payment of gold as a priority and therefore the need for them to save all the time. As a result of this, the E. Yeboah Gold Buying Enterprise saves with various financial institutions within the municipality among which include Standard Chattered, Barclays and Ecobank. According to him he has very good business relationship with the Standard Chartered Bank and has even received some best clients' awards from them.

#### 8.4.2 Campari Licensed Gold Buying Agency

The agency is located in a storey building opposite the GPRTU office in Tarkwa. It has seven permanent workers who perform roles such as getting new clients, visiting small scale mining sites to buy the processed but unrefined gold, and assessing the genuiness of the gold that clients bring to their enterprise before they are weighed. Some are also in charge of the scaling and pricing of gold.

The production and income level of the agency is usually unpredictable due to the unstable supply and price of gold. On the average, it can be estimated at GH¢15,000 per month when the business is not all that good and about GH¢100,000 during good business times. This high level of instability has led to a high level of savings by the management of the agency in order to ensure its continuous and smooth operation in the lean season. The agency sells gold to the PMMC and the Chyuan Chya Group.

##### *Sale and Determination of Gold Prices*

With respect to the sale of gold to the agency, gold that is sold is in the form of *Dust* or *Nugget (solid)*. Gold is purchased from both licensed and galamsey miners. It is sold by individuals or group of miners or their agents. Some of the workers of the agency also go to the various ASM sites to purchase the gold. According to the owner of the Agency, this package was introduced in view of the keen competition in the gold purchasing business. This arrangement has helped to win the trust and interest of most of the small-scale miners in the sale of their product to the agency. Sales are purely cash based and sometimes payments are made to bank accounts if requested by clients.

In terms of the determination of the prices of gold, various means are used in obtaining information on world market prices. Common among these sources are the News broadcast on television and the internet. After obtaining the global gold price, a Mathematical formula is used to calculate the monetary value of the gold with the help of a price log sheet (ref. Appendix 4) which is pasted on the notice board of the agency. The price log is used by both the sellers and the staff of the agency to aid the calculation. According to the owner of the agency, the small scale miners who are their clients understand the mathematical calculations and are usually involved in the calculation. This again supports the level of literacy and intelligence of the stakeholders in the ASM sector.

### **8.5. Experiences of Retired or Former Galamsey Workers and Gold Dealers**

In the course of the survey, three former galamsey workers and one gold buying agent (popularly known as gold dealer) were interviewed in three of the study communities namely; Akyempim, Bankyim and Tarkwa. According to Mr. Amoah of Bankyim, he was involved in the ASM business from 1969 to 1995. According to him, before the legalisation of the small scale sector in 1989, the business was lucrative but very dangerous. They were regularly subjected to raids by the police and sometimes they lost a lot of money through these raids. Their lives were also threatened since they run in any direction upon hearing the word 'scatter' from their colleagues.

Another challenge that was faced by people in the sector could be attributed to the low level of technology in the sector. For instance, people defrauded others by selling fake gold popularly known as 'alaga'. The most popular way of testing the gold was by heating it and dipping it in water. If the colour turned black then it was alaga. Gold dealers who bought gold from such people on credit also sometimes cheated them or bolted with the mineral. A man who was defrauded had to suffer indebtedness which forced him to quit the job in 1995. However he still believes that the galamsey job is good because he was able to invest in housing and that is what he depends on in his old age. He also believes that it provides a source of livelihood for the numerous youth in the community. He asserted that currently the business is better with the introduction of modern technology and the legalisation of the sector.

Another retired worker, who is now a community chief known in the local parlance as odikro, indicated that he had been in the ASM business for about 30 years. According to him, previously, one could not just enter the sector and start working. One had to understudy the leader or owner of a concession like an apprentice before one could be on his own. He also indicated that currently the business is better in terms of their relationship with law enforcement agencies. Previously, they had to sell the gold in neighbouring countries such as Togo, Liberia and La Cote d'Ivoire. They were exposed to robbers, fraudsters or harsh treatment from security personnel at the borders. According to him, sometimes he had to disguise himself and dress like a woman before he could go through. In his view, it is difficult to leave the gold business once one starts it. Consequently, even though he has retired from the business he sometimes buys and sells gold. He invested some of the money he got from the galamsey business into housing and farming. According to him he trained a

lot of people who are currently influential in the small scale mining sector. He also believes that the ASM business is good because it has helped people to acquire wealth and open up businesses despite the numerous risks associated with it.

Two respondents who were introduced to galamsey activities by their friends are relatively young. They went into the job with the hope of raising money to finance their education. They however found it difficult to leave the work. According to them, it is a dangerous activity and there is a high risk of being exposed to harmful chemicals such as mercury and also social vices such as drugs and prostitution. According to them, they left the job because some of the elderly people they worked with contracted strange diseases and had to spend all their money on their health but eventually died as paupers.

The accounts of all the former workers in the ASM sector confirmed the fact that the job is risky both in terms of exposure to harmful chemicals, exposure to social vices and the risk of being defrauded or arrested by the police or be in debt. It is also obvious from their accounts that with the passage of the Small- Scale Mining Law and the establishment of the PMMC, things are better, for instance there is a ready market for gold and one does not need to smuggle it to neighbouring countries. This also helps to improve the quantity of gold exported by the state and the contribution of gold to the foreign exchange earned.

From all the above, it can be said that ASM is a major source of livelihood in the Tarkwa Nsuaem Municipality. There are various stakeholders in the ASM sector such as concession owners, permanent workers, tenant workers, sponsors, local buying agents, processors, host communities and the state. The activities of all these stakeholders contribute in different ways (positively and negatively) to the local economy of the Municipality. All the six studied ASM operators and their related activities offer employment to people in the municipality. In spite of the fact that ASM activities have negative impact on the environment and cultural practices of the communities, it helps to keep the youth who would have been engaged in negative practices such as robbery employed. However, majority of people (90 percent) in the ASM sector do not see it as a sustainable source of livelihood and are only in it to get money for a more sustainable source of livelihood.

## **8.6. The Contribution of Mining to the Development of the Communities in the Municipality**

The analyses of the nature of ASM in the mining communities have revealed that the sector serves as a major source of livelihood to most people especially the youth in the communities. The sector's quick economic returns, a belief shared by both current and former employees, have been an attracting force for migrants from both within and outside the Western Region into the mining communities. The economic potentials have also retained the economically active age-group who otherwise would have migrated out of the communities due to limited employment opportunities. These individual benefits are expected to culminate into community development. The next part of the chapter examines the contribution of the ASM to the development of the mining communities.

Mining provides many opportunities to support sustainable development. In a number of countries, including Mali, Tanzania, South Africa, Zambia and Mozambique, the role of mining, particularly, ASM in improving livelihood for rural poor communities has been recognised (UNEP, 2006). At the household levels, although mining activities may transcend the development of economic livelihood capitals, often the most obvious contribution of mining to development at the household level is related to household economic welfare and this has direct impact on development at the community level. The UNEP (2006) also confirms that ASM has been a major source of income, increasing the wealth of rural populations. Income from ASM activities supports investments in agriculture and non-agricultural pursuits, and these increase the options available to rural communities. However, the contribution of mining to the development of host communities is not always positive. Both the positive and negative contributions of mining, particularly ASM to the development of the host communities in the Tarkwa-Nsuaem Municipality were therefore analysed in this chapter.

### **8.6.1 Mining and Local Economic Development in the Tarkwa-Nsuaem Municipality**

Two main observations relating to economic empowerment were made by the study in the Municipality. Mining provides employment and income for respondents and 50.50 percent of the household heads interviewed were employed in the mining sector. This was an increase from the 22.80 percent of respondents who were initially engaged in the activity. Mining therefore is the main source of occupation of households in the host communities and offers

the mechanism for human welfare development and conditions for sustainable livelihood development in the Municipality.

Adopting alternative livelihood approaches is critical since the mining sector is not able to employ most of the unemployed youth of the municipality. The approach is associated with the dependency theory and the economic principle of diversification. It was realised that the continuous dependence on one source of livelihood could trigger vulnerability in times of price fluctuations and seasonal imbalances especially for economic activities such as ASM. It becomes more critical as exploration is experimental and with little productivity. Evidence from the study suggests that returns on mining are being invested in other occupations such as artisan, housing, and trading as respondents have come to realise the eccentricity of the occupation they are engaged in.

Chapter seven revealed that 69.23 percent of the miners had invested in other jobs and this provides evidence of the desire for livelihood diversification which must be supported with capacity building interventions and systemic efficiency to facilitate a thriving diversified local economy. This is where local economic development interventions come into play.

According to the World Bank (2011), local economic development offers local government, the private sector, the not-for-profit sectors and the local community the opportunity to work together to improve the local economy. It aims to enhance competitiveness and thus encourage sustainable growth that is inclusive. Adopting alternative livelihoods would therefore promote economic activities that constitute alternative sources of income generating activities, an enterprise development approach which seeks to develop and grow enterprises and economic opportunities by providing services that address their particular needs (Jiwa and Wanjau, 2008). This helps to build the capacity of local inhabitants in other occupations rather than traditional occupations such as mining in the municipality. An enhancement of the alternative livelihood approach which has been adopted by the LSMs in the municipality over the years is the sustainable livelihood approach which seeks to promote diversity and sustainability in mainstream and alternative livelihoods.

From the study, it was also evident that income levels had also generally increased per the responses from the inhabitants. Initially, 13.50 percent earned below GH¢ 50.0 a month. Only 1.50 percent of the respondents earned below GH¢ 50.0 at the time of the survey and this was

an indication of increasing income levels of respondents. Even though the proportion of respondents who earned between GH¢ 51-100 a month declined, the movement resulted in increases in the proportions of those who earned between GH¢ 151 to above GH¢ 250 per month.

The critical factor which influenced this dichotomy is the kind of occupation that respondents of the municipality were engaged in. Comparing initial and current earnings from income levels, it was realised that farmers constituted the least proportion for all the income levels. It however witnessed increases in proportion in income levels after the introduction of mining activities. For instance, 5.16 percent of those engaged in farming earned GH¢ 51-100 per month as compared to 22.50 percent in the same category. Several differences were observed and this tends to suggest the marked contribution of the mining industry to the income levels of inhabitants in the Tarkwa-Nsuaem Municipality.

Overall, mining has enhanced the living standards of people in the host communities. Comparison between initial and current household financial status indicated marked improvement in financial standings for miners than any other occupation. Similar evidence was identified among farmers with varied observations made for those engaged in trading. For instance, 56.25 percent of those who indicated that they were financially adequate previously were miners compared to the 72.03 percent recorded for those currently engaged in mining. Proportions of miners who indicated that their financial standings was moderate also increased from 73.82 percent to 84.62 percent and those who indicated poor financial status declined from 85.93 percent to 34.29 percent. This demonstrates the effects of mining as a major source of employment and income in the study communities.

Even though traders indicated that their income levels had increased, it is evident that this had not necessarily translated into higher financial standings. The proportion of traders who indicated adequate financial standings declined from 43.75 percent to 16.10 percent while those who indicated poor financial standings increased from 0.74 percent to 54.29 percent. This suggests that higher income levels may not necessarily translate into higher financial standings as issues of cost of living must be taken into account.

Mining also empowers indigenous people by providing opportunities to realize their goals, by reducing poverty and providing community and individual amenities, by employment

opportunities, and by providing a share of project benefits (IIED and WBCSD, 2003). For most communities, mining enhances livelihoods by developing systems and mechanisms that improve access to good health care, high standards of education, decent housing, meaningful employment, and the growth of local businesses that are the markers of local economic development (Eggert, 2001; Downing et al. 2002, Hentschel et al. 2002, IIED and WBCSD 2003). UNEP (2006) also adds that ASM has been a major source of income which increases the wealth of rural populations. This new income supports investments in agriculture and non-agricultural pursuits, and thus increases the options available to rural communities. According to the traditional council members and other opinion leaders interviewed, mining has helped to reduce the rate of criminal activities in the municipality since most of the unemployed population who would have resorted to criminal activities are engaged in the ASM sector. In spite of all these contributions, the negative impact of mining, particularly ASM activities raise a lot of concern about livelihood and environmental sustainability.

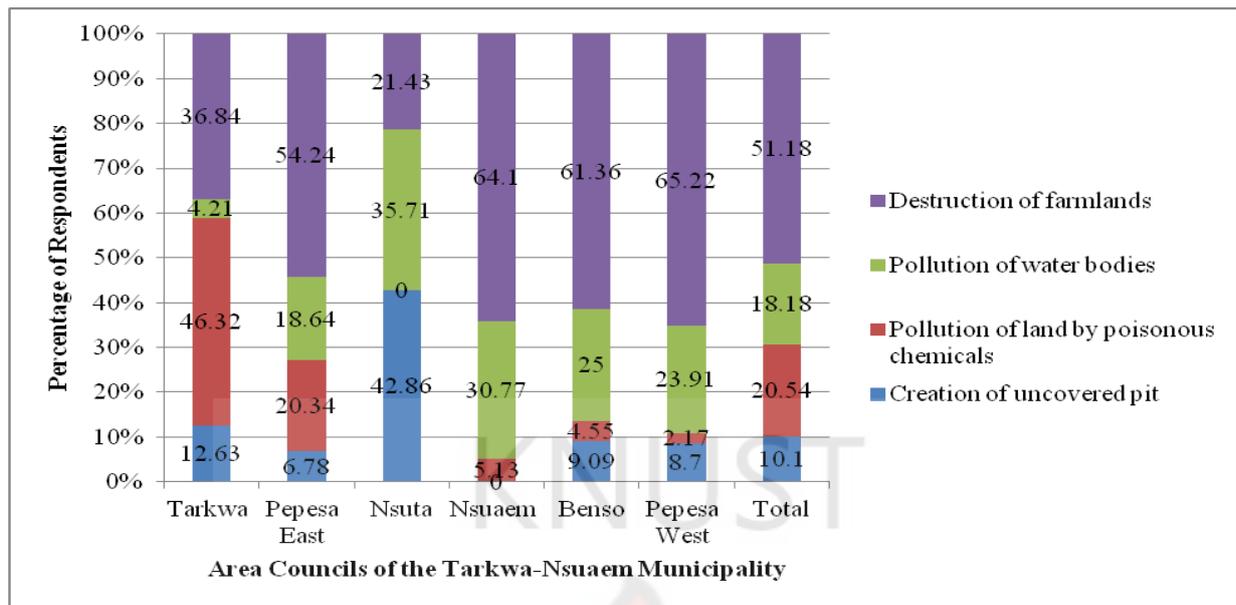
#### 8.6.2 Mining, Environment and Development in the Municipality

Mining; whether ASM or LSM; brings along direct and indirect income opportunities in host communities. It is also more attractive than traditional activities like agriculture. The discovery and exploration of the deposit may trigger the desertion of farmland (Hentschel et al. 2002). This may result in low agricultural production thus leading to shortages in the supply of foods. This may be solved by importation but the accompanying high cost of living and upsurge in prices as a result of income and demand factors may affect most indigenous people who continue to engage in low paying occupations such as farming. The study indicates that inhabitants in well paid occupations such as trading were affected by these consequences. Even though mining can help inhabitants of host communities to have livelihoods and become economically empowered, it also presents critical issues of sustainability as conditions are created that erode the potentials of mining. In view of this dichotomy, acceptance of the fact that mining has a role to play in the future of host communities goes with similar responsibilities for managing the negative externalities of mining. This brings to the fore the issue of environmental sustainability and sustainable development both of which focus on maintaining a sound and regenerative natural environment that support the livelihoods of many vulnerable and poor people in mining communities.

The study revealed that on the average, 85.0 percent of respondents indicated the main economic activity taking place in their communities was ASM particularly, *galamsey*. Most respondents (i.e. 74.30) indicated that mining had affected the environment of their communities in various ways while 25.70 percent stated the contrary. The effects of mining were pronounced in area councils where artisanal and small-scale mining especially *galamsey* were predominant. For instance, respondents in Tarkwa, Pepesa, Nsuaem, Benso and Pepesa West where artisanal and small scale mining activities recorded proportions of 95.0 percent, 98.30 percent, 63.90 percent, 73.30 percent and 76.70 percent of respondents affirmed the effects of mining on the communities. Similarly, 53.70 percent of respondents in the Nsuta Area Council indicated that mining has had effect on their environments. This suggests that ASM activities have had dire effects on the communities in these urban/area councils. Respondents indicated several negative effects of mining activities on the environment in their various communities. The study identified uncovered pits, polluted lands by poisonous chemicals such as mercury and cyanide, polluted water bodies and destroyed farmlands as evidence of the negative effects associated with ASM activities. According to Todaro and Smith (2011), future growth and overall quality of life are critically dependent on the quality of the environment. However, persistent poverty is the root of much locally caused environmental degradation. The natural resource endowments of a community and the quality of its air, water and land represent a common heritage for all generations. To destroy that endowment indiscriminately in the pursuit of short-term economic goals penalises both present and future generations.

From the study, respondents indicated that they had benefited both positively and negatively from mining. Employment, income and job security were the examples cited by respondents as positive effects of mining to them. However, respondents also indicated negative effects of mining on them. Citing personal experiences, respondents identified that mining had resulted in increased prevalence of diseases, led to destruction of farmlands, pollution of water bodies, and pollution of air through blasting.

**Figure 8.1. Effects of Mining Activities on the Environment of Communities.**



Source: Tarkwa-Nsuaem Field Survey, August, 2010

Apparently, the respondents indicated that mining companies were not doing much to enhance the benefits and reduce the negative effects. Evidence from the field revealed that 46.98 percent of respondents were of the view that mining companies were helping mostly through sensitisation while 53.02 percent of respondents felt that no effort had been initiated by mining companies. This provides an indication of the levels of satisfaction of people with mining companies in the Municipality and provides for increase in partnership between mining companies, ASMs and members of host communities.

### **8.7 The Measures Put in Place to Ensure the Sustainability of Livelihoods.**

Several measures have been put in place at the global, national and local levels to ensure the sustainability of livelihoods in mining communities. The UN (2010) however notes that unfortunately exploitation of natural resources such as forests, land, water, and fisheries often by the powerful few have caused alarming changes in the natural world in recent decades, often harming the most vulnerable people in the world who depend on natural resources for their livelihood. This calls for greater concerns especially in mining communities where LSM and ASM directly affect the natural environment in diverse ways. Taking a precautionary approach requires acknowledging the potential for unforeseen consequences, complex effects and ignorance (Scoones, 2002). This would enable all actors institute actions to promote livelihoods that are sustainable. That is, interventions that can help inhabitants of mining

communities cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base (Scoones, 1998). Taking precautionary approach would thus offer an opportunity for all actors to address normative values of justice, fairness and responsibility which classical risk assessment does not do (Mohamed-Katerere, 2003).

Both governmental and non-governmental agencies have put in place various measures to ensure the sustainability of livelihoods in mining communities in the Tarkwa-Nsuaem Municipality. The state has also enacted various Laws, Acts, Regulations, Small Scale Enactments and Relevant Codes of Practice to ensure that livelihoods in mining communities are not adversely affected by mining activities. Various agencies and institutions such as the Minerals Commission and EPA have also been put in place to monitor and ensure compliance. These agencies are however under resourced and it is also difficult to ensure effective control and monitoring of galamsey activities which takes place extensively in the municipality. As part of government's efforts to reduce poverty and ensure livelihood sustainability in the municipality, the Tarkwa-Nsuaem Municipal Assembly has helped to provide infrastructural facilities as well as the creation of enabling environment for investment in the various sectors. The Municipal Assembly also collaborates with corporate bodies such as LSMs particularly Goldfields Ghana Limited to carry out sustainable or alternative livelihood projects for mine affected communities.

The World Bank and the GIZ funded an attempt to improve the technological aspect of ASM. In recent times, an extensive research has been carried out by the British Geological Survey (BGS) in collaboration with Wardell Armstrong and the University of Mines and Technology for the European Union Development Fund, Mining Sector Programme in Ghana. The project is basically focused on Mercury Abatement in the artisanal and small-scale mining sector in Ghana. From the above it can be said that a lot of efforts have been made to assist the ASM sector in Ghana since the early 1990s. GTZ and the World Bank as well as the European Union have been instrumental in these efforts yet little impact has been made in the ASM sector in Ghana.

The Traditional Council has also contributed in various ways to ensure livelihood sustainability in the municipality. A typical example is the training of the youth in bamboo furniture making which failed. Even though the Traditional Council attributes the failure to

the quest of the youth for quick money from ASM, it could be attributed in reality to the lack of extensive consultation by all stakeholders. NGOs such as WACAM also help in various ways especially through advocacy and other activities to ensure livelihood sustainability in the municipality. However some of the respondents are of the view that some of the NGOs rather exploit them and create problems between and communities and some mining companies.

From all the above, it can be said that mining, particularly ASM activities, have contributed both positively and negatively to the local economies of host communities. From the study, it can be said that although mining enables inhabitants of host communities to have livelihoods and become economically empowered, it also presents critical issues of sustainability. Respondents indicated that ASM provides employment and income to household heads and members. However, they also highlighted the negative effects of mining on them and their environments. In spite of the several measures put in place at the global, national and local levels to ensure the sustainability of livelihoods in mining communities the is still remains a major concern for all stakeholders.

This chapter which was a continuation of the analyses of the previous chapter has revealed that the mining sector plays a kingpin role in employment creation at the local level. The sector is the major source of livelihood for several households. The livelihood support is both direct via direct employment through the production chain from mining through processing to buying, and indirectly through food vending at the mining sites. The ASM workers, realising that their operations are not sustainable, have begun investing their returns in more sustainable ventures.

Despite its economic gains, the sector has come with several environmental effects which affects not only the health of the miners but the host communities in general. The next chapter (chapter nine) outlines measures that are required to promote sustainable livelihoods in the host communities. These recommendations are aimed at sustainable poverty reduction in the host communities.

## CHAPTER NINE

### SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

The analysis of the nature of livelihoods in the mining communities in the Tarkwa-Nsuaem Municipality revealed multiple factors influencing livelihoods in terms of human, physical, social and economic assets which are mutually reinforcing. The analyses further revealed that mining, more specifically ASM, has been the major source of economic livelihood in the host communities. This chapter outlines the major findings from the study. Recommendations are also made based on the findings.

#### 9.1 Summary of Major Findings

This section of the chapter presents the major findings from the study of livelihoods in the mining communities within the Tarkwa-Nsuaem municipality.

##### 9.1.1 The Nature of Livelihoods in the Tarkwa-Nsuaem Municipality

The analysis revealed that 95 percent of the economic activities were informal as exemplified in the classical theory of the informal sector. The analysis further revealed that 5 percent of the miners were employed in LSM activities while 80 percent were engaged in ASM.

The informal nature of the livelihoods was explained by the nature of human capital in the mining communities. The analysis revealed that 99.02 percent of the respondents had had formal education. In spite of this, it was difficult for them to be engaged in the formal sector activities since they lacked the requisite skills due to low formal education to be employed in this sector. It was also observed that 8.8 percent of the respondents had tertiary education that could enable them to be gainfully employed in the LSM sector as well as the formal sector in the municipality. Beside the needed high level technical skills that most of the respondents did not have, they also lacked basic technical skills that could enable them get employment at the lower levels of the occupational category in LSMs and other formal sectors that require such skills. This was an issue of concern to the chiefs and other opinion leaders in the municipality. ASM was therefore the single most important source of economic livelihoods for households in the study communities. This is especially true for male household heads who were mostly the breadwinners of their households. Mining is more attractive to the youth in the municipality than agriculture which is mainly on subsistence

basis. It is therefore not surprising that the study revealed that 63.64 percent of the respondents in the studied licensed and unlicensed ASMs were within ages of 18-35 years.

From the data gathered, 4.50 percent of the household heads earned below GH¢ 50 which is almost half of the minimum wage of GH¢ 3.20 a day (i.e. US\$ 50.75 and GH¢ 92.4 a month). In all, 44.0 percent of the respondents earned over GH¢ 201 per month. The highest earners in the municipality were miners and artisans. Out of 202 miners sampled, 118 representing 58.42 percent earned above GH¢ 201 per month as compared to that of farmers of 16.67 percent. Due to the high income from the mining sector, the youth were attracted to ASM at the expense of agriculture. With the movement of people from the agricultural sector to the ASM sector, the factors of risk and vulnerability increased for the local communities in the short and long term as access to arable land reduced. ASM activities particularly, galamsey destroy arable lands and crops. Consequently, the study revealed that 58.20 percent of respondents in the household analysis found it difficult to access land, 12 percent deemed it moderate while 29.80 percent expressed ease in access to land. For all those who mentioned that access to land was easy, it was realised that 45.40 percent were miners. Traders accounted for 14.30 percent while persons in the public sector accounted for the least proportion of this response of 3.20 percent. Farmers recorded 31.10 percent. For households in rural and or mining communities, land is the most important asset for sustainable livelihood empowerment. Difficult access to land therefore poses a potential risk to livelihood sustainability in the municipality. This may have implications for food insecurity in the region and increased vulnerability of local communities.

The study revealed that women were engaged in lower paid ASM activities and other economic activities that were associated with mining. This was evident in the studied ASM groups. No woman was employed as a permanent worker or directly involved in ore extraction particularly underground mining or owned a concession. All the respondents at the studied licensed and unlicensed ASM do not see how women can work underground and would not even encourage it. This could be attributed to cultural perceptions and traditional beliefs about the roles of women in general. The study identified that the women mostly conveyed sand or operated at the sites as food vendors. However, the greatest source of economic livelihood for adult females in the municipality was associated with small business ventures or microenterprises that required little start-up capital. Some of the women worked or traded at the ASM sites with their younger children. The entire environment was not safe

for such children. In effect, women were contributors to livelihood empowerment in their various households and this has critical implications for household decision-making and investment. This ensures livelihood sustainability of women. For these women, being engaged in economic activities allows them control over their own income and tends to enable them cater for their children adequately. These women would be more able and generally more willing to influence girl- child education, cater for the health of their families leading to a potential reduction in female mortality and morbidity and an increase in women's economic empowerment which are all in line with the first seven goals of the Millennium Development Goals.

To make the production chain complete, were gold processing groups and Gold Buying Agents which appeared at the tail end of the chain. The ore processing groups promoted the activities of ASMs especially galamsey groups who do not own processing plants. They also offered employment to people in the municipality. They however contributed to the environmental degradation in many ways and some of them operated in the built environment near homes as was observed in the case of the Essuman Processing Company at Nsuaem. This practice is well-explained by the Hardin's Tragedy of the Commons. The non-compatibility of mining land use to the adjoining land use is negating the gains from mining. It is therefore imperative that mining in the built environment is checked by the stakeholders including but not limited to the Minerals Commission, Municipal Assembly and Traditional Authorities.

There were also gold buying agencies in the municipality who offered employment to people. These agencies have registered with the PMMC and they buy gold from ASM groups and sell it to PMMC and other registered agencies. The gold buying agencies were expected to work closely with the PMMC but it is difficult to get the LBAs to sell gold to them due to the presence of Lebanese, Chinese and Indian gold buyers who buy the gold directly from the LBAs. Other foreign gold buyers who were licensed by the Minerals Commission also competed with the PMMC in the purchase of gold from the LBAs. All these factors have contributed to the decrease in the amount of gold purchased by the PMMC.

#### *Challenges Associated with ASM as a Major Source of Employment*

Although ASM offered employment to majority of people in the Tarkwa-Nsuaem Municipality, there were some challenges associated with their operations such as lack of

documentation on staff, no laid down rules on staff recruitment, crude method of ore extraction and processing, weak safety and security measures for the wellbeing of employees and poor access to loans or credit from financial institutions. Access to loan emerged as one of the challenges facing the ASMs. Lack of adequate capital in the ASM sector is a major problem in the municipality and all the respondents indicated that they would want the government to assist them financially through loans. All these problems render the ASM subsector uncertain.

Subsequently, most of the respondents in this sector tend to invest in other livelihoods that were deemed to be more sustainable and could be relied upon in times of intermittency in demand and production of gold with capital generated from ASM. For instance 69.23 percent invested in other businesses such as transportation, housing, trading and also in education. In terms of the prospects of these investments, 8.49 percent of all respondents indicated the prospects of their investments as high while 68.81 percent rated the prospects to be moderate. The rest of the 22.70 percent rated the prospects of their business to be low.

#### 9.1.2 Factors that affect the Choice of Livelihoods in the Municipality

The first factor that affected the choice of livelihoods was educational level of the respondents. Though, educational level was not seen to have influenced the type of occupation, but rather the roles the individuals played in the occupations. The analyses revealed that household heads that had tertiary education were appointed into management and administrative positions in the ASMs while those with low educational levels were engaged in the extraction of the ore.

The study indicated that income from occupations influenced the kind of choices people made particularly, choices on their livelihood capabilities. Although the study confirmed some literature findings, there was divergence in some circumstances indicating the dynamics and intricacies in the factors that affected people's choice of livelihoods. From all the analyses, it was revealed that economic endowments were as important as the social capital. Social and human capital in the form of family networks, education, institutional mechanisms for enhancing access to opportunities, socio-economic opportunities and services were critical issues that determined households' choices on duration to stay in a particular area, create networks and engage in economic activities.

The study revealed that most earnings from ASM were invested in other businesses to enhance households' abilities in managing risks and shocks. At this level, social capital in the form of marital status became eminent as those who were married were able to create family businesses for their spouses to engage in. The wives of the concession owners and miners sold food to the miners. Others operated micro enterprises in the mining communities. The type of occupation therefore affected the conditions for, and influenced the forms of livelihood diversification that were adopted by communities as these investments were dependent on the investment capabilities of households. The differences in the livelihood choices and activities practiced by inhabitants of mining communities could therefore be traced to a variety of historical, environmental and social factors, public and social service provision and economic trends.

Gender relationships were also important in the choice of livelihoods and the roles they played in the economic activities. For instance, both men and women played important roles in ASM. These gender roles were linked to their different needs and interests which informed their choice of livelihoods. The choice of livelihood varied for men and women depending on the gender relations within the household, community, and livelihood systems that regulated access to and control over resources and management responsibilities. This also informed their ability to manage and use natural resources and available economic opportunities and services to cope, and reduce risks and shocks to ensure sustainability of livelihoods. In the mines, the roles the women played were limited to conveying ore from the extraction point to the processing point at a fee of GH¢1.50 per load. The men were the miners who went underground to extract the minerals from the mineral-bearing rocks. They also processed the ore to extract the mineral. Thus, the sex determined the gender roles assigned to an individual on the mining site.

Another factor which affected livelihoods was the migration status of the household head. Observation made in the municipality is in line with most studies that indicate that movements of people and the decision to remain at a particular location is influenced by work and income returns and other economic opportunities for livelihood enhancement. Those from outside the municipality were motivated by economic factors of mining while most indigenes preferred to remain in their place of birth for same reasons. Consequently, it was observed that internally, many local people who migrated to mining centres were lured, in part, by employment and other economic opportunities as well as services that the industry

offers. The study noted that the indigenes preferred to invest their capital in the communities. This was evident in the conditions of the houses they occupied, which were built with sandcrete block and roofed with aluminium sheets. The migrants on the other hand lived in mud house because they believe they will go back to their places of origin after some time.

From the discussions on the factors that influenced individuals to stay for longer periods of time, it was realised that, several factors influenced decision-making differently. In the first place, the fact that most persons tend to stay in the communities that they were born suggests that the costs of moving-both direct travel costs and the costs of locating and joining a migrant network-represent important barriers to labour mobility in the municipality. Similarly, with greater proportion of respondents being restricted to the region where they stay indicated that movements were predominantly within the same region that is, intra-regional migration as revealed by the study of the ASMs where most, (i.e. 80 percent) of the workers at all the ASM sites were not indigenes or Wassa, 30 percent were from other districts in the Western region while the remaining 50 percent came from other regions of Ghana. Those who came from other regions were mainly from the Central, Ashanti, Brong Ahafo regions and the three Northern regions.

### 9.1.3 The Contribution of ASM Mining to the Development of the Municipality

Two main observations relating to economic empowerment were made from the study in the Municipality. Mining provided employment and income for 50.50 percent of the respondents from the household survey. It had also helped to generate other jobs such as ore processing and gold buying agencies. Beside the Tarkwa Urban Council, which is a highly urbanised environment characterised by a multiplicity of economic activities and potentials, mining affected the living conditions of 31.7 percent, 28.30 percent, 33.30 percent, 38.30 percent and 43.30 percent of respondents in Pepesa East, Nsuta, Nsuaem, Benso and Pepesa West Area Councils respectively. Similar observations were made concerning income as a result of mining on living conditions.

Mining provided these people with employment and income and put them among those with higher standard of living in the municipality. Majority (83.80 percent) of household heads had benefited directly from mining in the Municipality with 50 percent in the Tarkwa Urban Council, 98.30 percent, 95.0 percent, 93.30 percent and 95.0 percent in the Pepesa East, Nsuta, Nsuaem, Benso and Pepesa Area Councils. The lower proportion affected by mining

in the Tarkwa Urban Council is associated with the functions it plays as an urban area and the capital of the Municipality.

All the six ASM Operators contribute in different ways to the local economy of the Municipality. They offered employment to people in the municipality. There was generally a high rate of unemployment in the municipality and ASM was one of the avenues where people got jobs. According to the Traditional Council, in spite of the fact that ASM activities have negative impact on the environment and cultural practices of the communities, it helped to keep the youth, who would have been engaged in negative practices such as robbery, employed.

Mining has enhanced the living standard of people in the Tarkwa-Nsuaem Municipality. Comparison between initial and current household financial status indicated marked improvement in financial standings for miners than any other occupation. Similar evidence was identified among farmers with varied observations made for those engaged in trading. For instance, 56.25 percent of those who indicated that they were financially adequate previously were miners compared to the 72.03 percent recorded for those who were engaged in mining. Proportions of miners who indicated that their financial standings were moderate also increased from 73.82 percent to 84.62 percent and those who indicated poor financial status declined from 85.93 percent to 34.29 percent. This supports the fact that mining as a major source of livelihood is attractive to many people in the municipality. If well managed, mining could help to promote sustainable livelihood capabilities in the host communities.

From the study, it was also evident that income levels had also generally increased. Initially, 13.50 percent earned below GH¢50.0 a month. Only 1.50 percent of respondents earned below GH¢ 50 per month and this is an indication of increasing income levels of respondents. The proportion of respondents who earned between GH¢ 51-100 per month declined while those who earned above GH¢ 151 per month increased.

Mining had also helped individuals and households to raise the needed capital for other businesses. This has therefore helped to promote diversity and sustainability of alternative livelihoods. Evidence from the study suggests that returns from mining were being invested in other occupations such as transportation, trading, etc.

#### 9.1.4 The Impact of ASM on Livelihoods in the Municipality

ASM had both positive and negative impacts on host communities. This section focused on the negative impact of ASM since the positive impacts have been outlined already. Most respondents indicated that mining had affected their environment in various ways. About 74.30 percent of the respondents indicated so while 25.70 percent indicated the contrary. The effects of mining were pronounced in Area Councils where galamsey was predominant. For instance, respondents in Tarkwa, Pepesa, Nsuaem, Benso and Pepesa West where ASM activities were dominant recorded proportions of 95.0 percent, 98.30 percent, 63.90 percent, 73.30 percent and 76.70 percent of the respondents alleging negative effects of mining on their communities. Similarly, 53.70 percent of respondents in the Nsuta Area Council indicated that mining had negative effects on their environments. The respondents indicated several negative effects of mining activities on the environment in their various communities. These included the creation of uncovered pits, pollution of land by poisonous chemicals such as mercury and cyanide, pollution of water bodies, destruction of farmlands and cracks in buildings as a result of blasting. These effects further elucidate the Tragedy of the Commons that was identified among the theories that underpin the operation of ASM workers.

Airborne contaminants, such as rock dust, were mainly produced during drilling operations, mineral extraction, loading, crushing of rock or ore and blasting. Persons exposed to excessive dust for prolonged periods may suffer from permanent lung diseases, such as silicosis. Fumes, produced during shot-firing operations contain toxic gases (such as sulphur dioxide, nitrous oxide, nitric oxide, etc.) which, when inhaled, can lead to serious health damage of the lungs.

Malaria was attributed to uncovered pits created by ASM activities and pollution of water bodies and 91.67 percent indicated that the pollution of water bodies was the primary cause of typhoid and diarrhoea in their communities. Most of them indicated that mine related deaths were through accidents. However, according to the Municipal Public Health Nurse, studies conducted revealed that tuberculosis for instance, was a major health problem in galamsey communities. It was also noted that there was an indirect relationship between mining and some diseases such as HIV/AIDS. This is because commercial sex workers who aid in the spread of the disease migrate to mining areas where they get good market. From literature, it is conceded that it is difficult to associate mining with malaria. Nonetheless, the increased creation of uncovered pits as a result of ASM presents critical attributions that

relates to malaria as the spread of the diseases is compounded by stagnant waters that collect in these pits and the pools of water around some of the processing centres.

#### 9.1.5 Measures Put in Place to Ensure the Sustainability of Livelihoods in Mining Communities in the Tarkwa –Nsuaem Municipality

Government and non-governmental agencies as well as opinion leaders have put in place various measures to ensure the sustainability of livelihoods in mining communities in the Tarkwa-Nsuaem Municipality. Various institutions, departments and agencies embark on various programmes to sustain livelihoods in the municipality. The Municipal Assembly in collaboration with some of the LSMs such as Goldfields Ghana Limited have been organising alternative and sustainable livelihood programmes and projects for individuals directly affected by mining. The Municipal Health Service, the Minerals Commission and the EPA have been educating people on health issues and also ensuring effective monitoring and compliance with mining activities.

### **9.2 Recommendations**

The following recommendations were made based on the findings;

#### 9.2.1 Skills Development Programmes to Enhance Human Capital Base in the Municipality

The study has revealed that most of the people in the municipality, particularly the youth were engaged in ASM activities because they lacked the basic skills that would make them gain employment in the formal sector and LSMs. This is exemplified by the classical theory of the informal sector where due to the employment bottlenecks in the formal sector, many take advantage of the free entry and exit attributes of the informal economy to take employment solace. It is recommended that the Ministry of Education and the Ministry of Trade and Industry should encourage some of its departments and agencies such as the Labour Department, National Vocational Training Institute (NVTI), Opportunities Industrialisation Centre-Ghana (OIC-G) and the Integrated Community Centre for Employable Skills to collaborate with the Minerals Commission, the Municipal Assembly, National Board for Small Scale Industries, Traditional Council and the UMAT to organise vocational training or skills training programmes in the municipality under the National Apprenticeship Programme. The Ministry of Environment, Science and Technology should through its Ghana Skills and Technology Development Project (GSTDP) help in the skills development efforts. This is to help the youth and others acquire relevant skills and trade to

work efficiently in the various sectors of the local economy. This will also help to build the capacity of local people in other occupations and sectors to promote diversity and sustainability in livelihoods. Acquisition of skills will also enhance their chances of getting better jobs and better remuneration which will in turn help reduce the risks and vulnerability associated with their current jobs.

### 9.2.2 Creation of Opportunities for Continuing Education

Closely linked to the lack of skills is the fact that majority of respondents do not continue their education after the basic and secondary levels of education. Since educational capital is essential for the physical, economic and social development of the household, to some extent, these respondents had lesser chances of decreasing present and future socio-economic vulnerability, which is a significant factor in livelihood empowerment and poverty reduction. This normally has consequential effects on low labour productivity and local economic growth since the labour force would lack the innovative capacity to enhance the economy, and promote the adoption of new knowledge and new technologies. This is believed to have direct impact on the types of livelihoods in the municipality especially in increasing the human capital inherent in the labour force of the community. This could therefore explain the reason for the high proportion of respondents in the ASM sector of the municipal economy.

Despite the variation in educational levels, the evidence from the field provides enormous potential of livelihood enhancement through education. There is the need therefore to create opportunities for people especially, the youth to further their education beyond the basic and secondary levels. This could be done through the institutionalisation of scholarship schemes by local, national and international organisations such as the Municipal Assembly, Traditional Authorities, locally or internationally based non-governmental organisations and LSMs. The Ministry of Education in charge of tertiary education should encourage tertiary educational institutions such as the universities, polytechnics and teacher and nursing training institutions to run part-time programmes in the municipality. This will also help to train highly educated and skilled manpower who can be gainfully employed in the other sectors of the local economy. People with higher qualification and skills could also operate as partners of some of the formal sector operations in the municipality. It will also help to strengthen the private sector in the municipality and give them better bargaining power and control in the local economy.

In enhancing livelihoods, knowledge has become the key ingredient of the new production paradigm and an essential factor in the modernization of production systems and the economic behaviour of individuals. Higher and good quality education has positive correlation with sustainable livelihoods.

### 9.2.3 Modernisation of the Agricultural Sector in the Municipality

In order to address the challenges faced by the agricultural sector in the municipality and make it attractive to people, especially the youth, there is the need to modernise the sector. This is in line with the government's policy for the sector as a whole. It is necessary to modernise the sector through the introduction of technology in crops and animal husbandry. The Ministry of Food and Agriculture in collaboration with the Municipal Assembly and relevant non-governmental organisations should help set up Agricultural Mechanisation Service Centres (AMSECs) at each of the Area Councils. Various agricultural equipment should also be kept and managed by competent or trained staff from the local areas. It is recommended that the equipment should be given out to individuals or Farmer Based Organisations (FBOs) on rental basis at affordable rates in order to generate revenue to maintain them. In order to ensure local ownership, which is a prerequisite for sustainability, local capacity should be developed to manage the facilities with the monitoring left to the Municipal Assembly and Community Leaders.

The municipal office of MOFA should also help farmers to form vibrant FBOs which can work together to protect their common interests. The municipal office of MOFA should collaborate with the FBOs and the Municipal Assembly to help create vibrant market for the sale of farm produce. The central government should also facilitate the development of the Ghana Commercial Agriculture Project (GCAP) and decentralise it to the local levels. This will help to improve the investment climate for agri-business and also help develop public-private-partnership aimed at increasing on-farm production and value addition. Financial institutions in the municipality should also be encouraged by the Municipal Assembly and MOFA to give loans to individual farmers or FBOs on flexible terms which could be explained to mean flexible repayment periods due to the issue of gestation in agriculture. Another important component is land availability. This has become imperative owing to the fact that access to land in the mining communities has been rendered difficult due to the ASM operations. Lands rendered as waste due the activities of both the ASM and LSM should be reclaimed for use in agriculture. Thus, through the integrated approach, agriculture in the

municipality can be made attractive to the youth towards sustainable livelihoods in the municipality.

#### 9.2.4 Gender and Sustainable Livelihoods

The promotion of gender equality is necessary for sustainable livelihoods and sustainable development. The Women's Department of the Ministry of Women and Children's Affairs (MOWAC), Municipal Assembly (MA) and Gender-Based Non- governmental Organisations should work with micro-credit institutions to develop credit schemes that would provide women and women groups with micro-credits on flexible terms in the municipality. In the effort to help reduce poverty, loans are given under certain government projects or programmes such as MASLOC and it is recommended that gender mainstreaming is done to ensure that women are not left out.

#### *Women and Sustainable Livelihoods in ASM*

The Minerals Commission in collaboration with the Municipal Assembly and MOWAC should ensure that women in ASM are helped with credit and any assistance that will help improve their status in the sector. They should ensure that women are not limited to lower status jobs and low incomes in the sector due to traditional beliefs. More women should be encouraged to own concessions and also form women associations in the sector. This will help them to share common interest and also promote the spirit of solidarity that will help them pursue programmes that will help promote their status in the ASM sector as being practised in other African countries such as South Africa, Tanzania and Zambia. The Minerals Commission, Municipal Assembly, Ghana Education Service (GES) and the MOWAC, EPA as well as civil society organisations in the municipality should sensitise the not to take their children to the ASM sites since the environment at such places is not child friendly. This is in line with Articles 28(1) subsection (d) and 27 (2) of the 1992 Constitution of the Republic of Ghana. Articles 28(1) Subsection (d) states that children and young children shall receive special protection against exposure to physical and moral hazards. Articles 27 (2) also states that 'facilities shall be provided for the care of children of school-going age to enable women who perform their traditional roles of children caring to realise their full potential.

### 9.2.5 Establishment and Management of Small and Medium Scale Enterprises

Helping build local systems and channels for resource flow and expertise also enhance livelihood sustainability. Most of the respondents indicated that they invest in other sectors. This shows the desire for livelihood diversification which must be supported with capacity building interventions to facilitate a thriving diversified local economy. This is where local economic development interventions come into play. The Ministry of Trade and Industry should encourage some of its departments and agencies such as the Labour Department, Management Development and Productivity Institute (MDPI), NVTI, OIC-G and the Ghana Cooperative Council to work with the Municipal Assembly, the NBSSI, the private sector, the non-governmental organisations and other civil society organisations and the Traditional Authorities to work together to improve the local economy by helping individuals who are interested in setting up their own businesses with loans. Local entrepreneurs should also be given training in business and financial management.

### 9.2.6 Enforcement of Compliance with Small Scale Mining Laws and Regulations

In view of the fact that most of the ASM operations in the municipality were unlicensed, there is the need to strengthen the regulatory framework by building the capacity of relevant institutions such as the Minerals Commission, EPA and District Assemblies to carry out regular monitoring to flush them out. These institutions should be well resourced with qualified personnel and resources to enable them ensure enforcement of laws and regulations guiding the operations of ASMs. The EPA office in the Municipality should have a well equipped laboratory to test samples of polluted water, soil, vegetation, etc. Small scale operations should have well drawn out mine site plans which would be subjected to regular reviews and approval by appropriate state agencies. This is to ensure that they do not operate beyond approved boundaries as is the case sometimes. Regular environmental impact assessment should be carried out by the EPA and the Minerals Commission. The reclamation bond agreement practised in LSMs should be extended to the ASM sector. There is the need for the Ministry of Lands and Natural Resources and its sector agencies to ensure that land reclamation is carried out by ASM concessionaires concurrently with mining. Pits should be covered and reforestation and re-grassing carried out with the help of the Forestry Commission. Land reclamation here will support agricultural production by making land available for the economic activity.

The Labour Department, Minerals Commission and EPA should ensure that ASM operations put down good safety and security measures such as the use of personnel protective clothing, and adoption of modern technology such as the use of mercury retort glass during processing to reduce the risk of accidents and excessive exposure of workers to chemicals such as mercury and cyanide. They should also ensure that processing and ASM companies do not operate in the built environment especially near homes. In line with the communicative theories especially on the grounds of ensuring environmental harmony, there should be dialogue among the stakeholders to adopt strategies to minimise the effects of mining on the environment. Companies which operate in the built environment should be banned from operating and the licenses of registered companies should be revoked. This can be facilitated by building processing workshops for the ASM workers and encouraging them to relocate their processing activities to the workshop. Their relocation is however based on mutual trust which in turn can be built by recognising the ASM subsector as key to development. The recognition may be instrumental in achieving a two-pronged objective of reducing environmental pollution and increasing the revenue base of the state.

These agencies and departments should also ensure that ASM companies document information on staff and adopt legal recruitment procedures. The central government in its quest of reducing the environmental impact of ASM can give tax rebates to licensed ASM who observe compliance. Award schemes can also be introduced by the Minerals Commission while the EPA could publish the names of registered companies who do not observe compliance. Information on the number of staff and their qualification should be regularly updated and monitored. The Mineral Commission and the EPA should also regularly educate workers and concession owners on the laws and regulations guiding the sector and the consequences for flaunting them. The MC and the EPA in collaboration with the UMAT should organise regular on the job training on the use of modern technology and best practices in the ASM sector for all stakeholders. Concessionaires should be encouraged to bear the cost of training for their workers.

The Development Partners who have also assisted the ASM workers for sometime should create a common pool where all their assistance will be channelled. All their support should then be directed at the ASM workers through their Associations. The criterion to consider in assisting the ASM workers should be the enterprises that are able to comply with the

requirements. This will be an effective means of ensuring compliance to the mining regulations by the mining workers.

Civil Society groups such as the Wassa Association of Communities Affected by Mining (WACAM), Friends of Rivers and Water Bodies and others should complement the efforts of the state agencies in ensuring compliance of mining regulations by the ASM workers. Their investigation into the effects of the activities of LSM companies can be extended to ASM firms so as to make the analyses holistic.

#### 9.2.7 Promotion of Local level Partnership and Enhanced Participation of Local leadership and Groups in the Management of ASM.

In spite of the numerous laws and efforts to prevent their operations by law enforcement agencies, galamsey activities take place wherever gold bearing rocks are discovered. This could be attributed to the fact that the regulations and policies are formulated at the national level with no involvement of local communities who are closer to the resource and who see it as a gift of nature to which they have automatic right to exploit. This is against the policy prescriptions encapsulated in both the advocacy and communicative theories. The theories posit that there ought to be a balance among economic, social and environmental development objectives which will be realised via participatory strategies. Their exclusion has often resulted in mistrust and conflict between community members, community leaders and law enforcement agencies. Even though they offer employment to the youth who would otherwise be involved in criminal activities, they also create a lot of problems and challenges to livelihood sustainability in host communities. It is therefore recommended that since ASM is a highly localised activity and sometimes interests, problems and issues vary from one local area to the other, local level participation in the formulation of regulations and policies should be encouraged. Chiefs, Assembly Members and Unit Committee members and recognised local groups such as youth associations should be involved in the allocation of concessions and also be part of local law enforcement and monitoring groups. This will help the MC and local communities and agencies to effectively manage natural resources for social and economic purposes.

#### 9.2.8 Community Ownership and Operation of Concessions

It is evident from the study that mining communities studied have good social capital through marriages and other relationships as well as long duration of stay in the communities. In line

with the advocacy theory explained in the third chapter, the potentials inherent in the social capital should be taken advantage of by forming cooperatives and associations that can put their resources together to own concessions and equipment. Groups and individuals of host communities should also be encouraged to partner with Ghanaian investors in the sector to own concessions. This will help to promote local economic development and enable all stakeholders institute actions to promote livelihoods that are sustainable. The participation of local groups and individuals in ASM will also help to prevent the activities of galamsey groups and ensure responsible mining practices. It will as well help to reduce migration and its attendant problems of over use of social and economic infrastructure facilities and the introduction of negative cultural practices.

Community ownership in the operation of concessions will also promote employment and help increase the purchasing power of community members which will also consequently help promote other economic activities in local communities. Community ownership and operation of concessions will also help the government, the Municipal Assembly, Traditional Authority and local authorities to tap the potential economic benefits such as taxes and the generation of revenue for development projects in host communities.

The associations and groups can collaborate with the regulatory agencies to flush out illegal mining from the communities. The association can then acquire concessions on behalf of members from MC and work with the chiefs and community leaders who are the custodians of the lands. Contractual agreements should also pay particular attention to land reclamation where the association could be held accountable in times of failure.

### **9.3 Conclusion**

The study set out to examine the sustainability of livelihoods by specifically examining the nature of livelihoods; identifying the factors that inform the choice of livelihoods; assessing the contribution of mining to development and the impact of ASM on livelihoods as well as the measures put in place to effectively regulate ASM activities in the municipality.

The findings from the study indicate that the ASM subsector is a major source of direct and indirect employment to households. The ASM workers were the highest income earners in the host communities. The decision to engage in ASM activities is influenced by several factors including skills, level of education and the high earnings from the mining activities.

The ASM activities have however had enormous effects on the environment and have thus affected access to land for other economic activities like farming. The lack of security (that is no protective clothing and insurance) in the operations of the ASM workers contribute to affect the sustainability of livelihoods.

The study concludes that livelihoods in the mining communities can be sustained by building the human capital base of the communities, modernising agriculture and involving community leaders and members in mining decision making.

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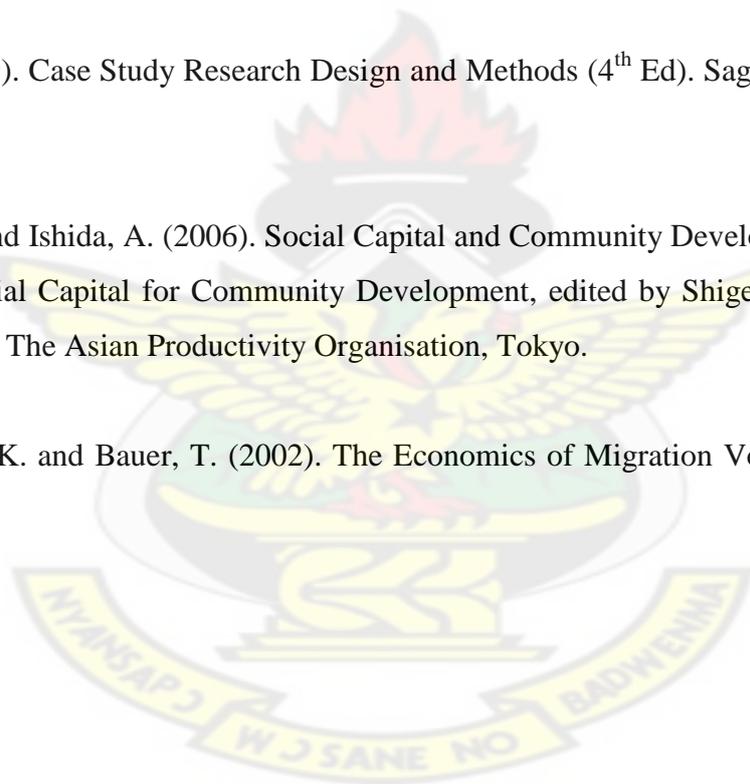
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**APPENDIX 1A**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**QUESTIONNAIRES FOR THE HOUSEHOLDS IN THE SELECTED MINING  
COMMUNITIES**

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**Research Topic:**

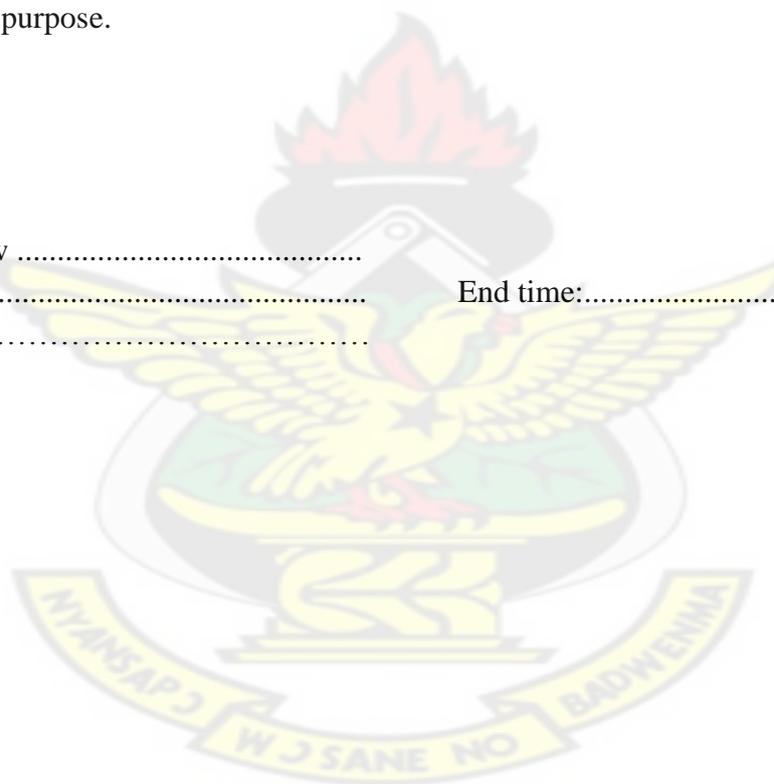
This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihoods in Mining Communities; A Case Study of the Tarkwa Nsuaem Municipality toward the partial fulfilment of the requirements of a **PhD in Planning**. Please, I assure you that any information provided would be treated with the deserving confidentiality and be used for purely academic purpose.

Date of Interview .....

Start time:.....

End time:.....

Town / Village .....



### Respondent's Background Information

1. Sex of Respondent            a. Male            b. Female
  
2. Age of respondent.....
  
3. Highest level of educational attainment
  - a. no formal education            b. no formal education but can read and write
  - c. basic (primary, middle or JSS) d. Secondary (SSS and Vocational/Technical)
  - e. Tertiary            f. Others, specify.....
  
5. Marital Status            a. Yes            b. No
  
6. If married, where does your spouse come from?
  - a. from this town            b. another district in the region            c. another district in the country
  - d. another Country            d. other, specify.....
  
7. What is the size of your household? .....
  
8. Number of dependents .....
  
9. What is your place of birth? .....

  - a. in this town            b. within municipality            c. another district in the region
  - d. other region            e. other country            f. other, specify .....

  
10. How long have you lived in the community? .....
  
11. What brought you here?
  - a. ....
  - b. ....
  
12. Do you plan to move out of this town in the near future? a. Yes            b. No
  
13. If yes, why would you move out?
  - a) .....
  - b) .....
  - c) .....
  
14. If no, give reasons?
  - a) .....
  - b) .....

**Socio-Economic Characteristics of Respondents before and during mining**

15. What was your major occupation before mining was introduced in this community?

- a. farming    b. fishing    c. civil/public service    d. artisan
- e. miner    f. other, specify.....

16. In your estimation, how much did you earn monthly/annually from your previous occupation? .....

17. How did you consider the households' financial standing before mining?

- a. adequate    b. moderate    c. poor

18. What reasons do you assign to the chosen option in question 17?

.....  
.....

19. Who is the breadwinner of your household?

- a. Self    b. Spouse
- c. extended family members    d. other, specify

20. If you are the only breadwinner why?

.....  
.....

21. What is your major occupation currently?

- a. farming    b. fishing    c. civil/public service    d. artisan
- e. miner    f. other, specify.....

22. How much do you earn monthly/annually from your current occupation?

- a. Daily.....    b. Weekly.....
- c. Monthly.....    d. annually

23. How do you consider the households financial standing?

- a. adequate    b. moderate    c. Poor

24. What reasons do you assign to the chosen option in question 23?

.....  
.....

25. What is the major occupation of your spouse?



35. Give reasons for the option in 35 above.

.....  
.....

36. If you depend on mining do you have any intentions to undertake other jobs?

- a. Yes                      b. No

37. If yes, what other jobs do you want to invest in?

.....  
.....

38. Do you have the requisite skills to undertake your intended job?

- a. Yes                      b. No

39. What are the prospects of your intended job ?.

.....  
.....

#### **Socio-economic Facilities in the ASM communities**

40. Main source of drinking water

- a. indoor pipe              b. private stand pipe              c. communal stand pipe  
d. well/borehole in house      e. communal well/borehole      f. stream/river  
g. other, specify.....

41. Type of energy for domestic cooking?

- a. fuel wood              b. kerosene              c. LPG              d. electricity  
e. charcoal              g. other, specify.....

42. Type of energy for lighting?

- a. kerosene      b. electricity      c. Solar              d. other, specify.....

43. Roofing material used for buildings.

- a. aluminium sheet      b. asbestos      c. thatch              d. other, specify.....

44. Type of toilet facilities used by inhabitants

- a. no toilet              b. WC              c. KVIP              d. pit latrine      e. other,  
specify.....

45. How is household refuse disposed?

- a. collection/designated point      b. empty land              c. along waterways  
e. other, specify.....

**Environmental Impact**

46. What kind of ASM activities presently go on in this community?  
a. underground                      b. surface mining                      c. other, specify

47. Are there any effects of the mining in this community on the environment?  
a. Yes b. No

48. If yes, please explain the effects  
.....  
.....

49. What have the mining groups or companies done about the environmental effects?  
.....  
.....

50. Do you have cracks on your building as a result of mine blasts?  
a. Yes                      b. No

51. What are the types of diseases your household members suffer from?  
a. ....  
b. ....

52. Which of the diseases do you associate with the mining your community  
a. ....  
b. ....

53. What are your reasons for associating the diseases with mining?  
.....  
.....

**Access to land**

54. How do you rate the level of access you have to land in this community?  
a. Easy                      b. Moderate                      c. Difficult

56. What are your reasons for the above option?  
.....  
.....

1. If not easy, is the difficulty associated with mining activities in the community?  
a. Yes                      b. No

2. If yes, what are your reasons?

.....  
.....

3. Has your land ever been taken by miners for their operations? a. Yes      b. No

60 . If yes, how were you compensated? .....

.....  
.....

61. How effective was the compensation in sustaining your livelihood?

.....  
.....

THANK YOU FOR YOUR TIME



**APENDIX 1B**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**ARTISANAL AND SMALL SCALE MINERS**

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**Purpose of Research:**

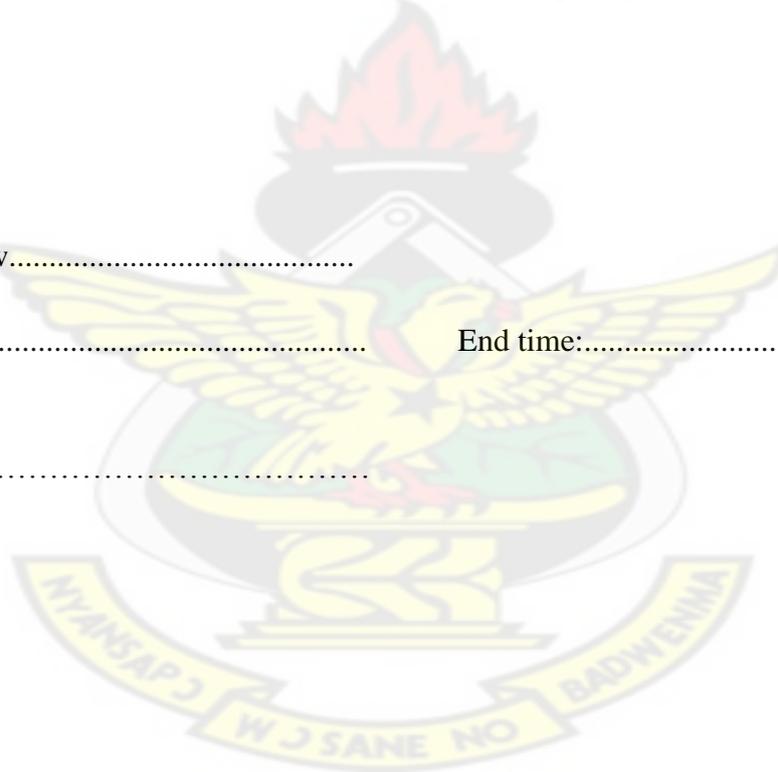
This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihoods in Mining Communities in the Tarkwa-Nsuaem Municipality toward the partial fulfilment of the requirements of a **PhD in Planning**. You are assured that any information provided would be treated with the deserved confidentiality and would be used purely for academic purpose.

Date of Interview.....

Start time:.....

End time:.....

Town / Village .....



**NAME OF GROUP.....**

**COMMUNITY/AREA OF OPERATION.....**

**Background Information on Respondents**

- 1. Name of respondent .....
- 2. Sex of Respondent      a. Male      b. Female
- 3. Age of respondent.....
- 4. Highest level of educational attainment
  - a. no formal education      b. no formal education but can read and write
  - c. basic (primary, middle or JSS) d. Secondary (SSS and Vocational/Technical)
  - e. Tertiary      f. Others, specify.....
- 5. Marital Status.      a. Yes      b. No
- 6. If married, where does your spouse come from?
  - a. from this town      b. another district in the region      c. another district in the country
  - d. another Country      d. other, specify.....
- 7. What is the size of your household? .....
- 8. Number of dependents .....
- 10. What is your place of birth? .....
- a. in this town      b. within district      c. another district in the region
- d. other region      e. other country      f. other, specify .....
- g. don't know
- 20. If you do not hail from this district, where specifically do you come from?  
.....
- 21. How long have you lived in this community?  
.....
- 22. Why did you leave your place of origin?
  - a. ....
  - b. ....
  - c. ....
- 23. Do you plan to move out of this town in the near future? a. Yes      b. No
- 24. If yes, give reasons why you would move out.
  - a) .....
  - b) .....
- 25. If no, why won't you move out?
  - c) .....
  - d) .....
- 26. If you are not working on your own concession, what are the terms under which you work?  
.....  
.....
- 27. Do you hope to get your own concession? Yes      No
- 28. If yes, where  
.....  
.....
- 29. How many hours do you spend on the job per day?  
.....

30. Do you have reporting and closing times? Yes No

31. If yes what are the times? Morning ..... Evening .....

32. How long have you been working in the company?

**Type of Mining Technology**

33. What type of mining do you undertake? a. surface mining b. underground/old mining shaft c. other, specify.....

34. How do you determine that a particular rock has gold deposit?

.....  
.....  
.....

35. Please, describe the method you use to extract the gold from the ore.

.....  
.....  
.....

36. How reliable have your methods for identifying the gold deposits been?

.....  
.....

**Income, Expenditure and Savings**

37. How much do you.

a. earn per

Day .....

Week .....

Month .....

Year .....

b. Spend per

Day .....

Week .....

Month .....

Year .....

38. How much are you able to save per.

Day .....

Week .....

Month .....

Year .....

39. Where do you save?

Bank.....

Susu.....

Others, (specify).....

40. What do you intend to use the savings for and why?

.....  
.....  
.....  
.....

**Marketing of ore or gold**

41. Where do you sell the gold or ore?

.....

42. How is the price of gold determined?

.....

**Alternative Sources of Livelihoods**

43. Do you have alternative means of livelihoods? a. Yes                      b. No

44. If yes, what are the alternative means of livelihood?

.....  
.....

45. If no, do you hope to acquire any training in other means of livelihood? a. Yes b. No

46. If yes, state the areas you intend to have your training.

- a) .....
- b) .....
- c) .....
- d) .....

47. If no, what will you do when the minerals are exhausted?

.....  
.....  
.....

**Small Scale Miners' Association**

48. As small scale miners, do you have any association? a. Yes                      b. No

49. If yes, are you a member of the Association? a. Yes                      b. No

50. If yes, what are the roles of the association in the development of your operations?

.....

**Contribution to the Development of Host Communities**

51. What are your contributions to the development the communities in which you operate?

.....  
.....

**Challenges**

52. What are some of the challenges of the job?

Economic

.....  
.....

Social

.....  
.....

Security

.....  
.....

Environmental

.....  
.....

Health

.....  
.....

**Perceptions**

53. What are some of the beliefs held about the following in your area being in general?

Gold.....

.....  
.....

Accidents.....

.....  
.....

Rituals.....

.....  
.....

Gods.....

.....  
.....

Any other

.....  
.....

**APPENDIX 1C**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**ASSEMBLY MEMBERS**

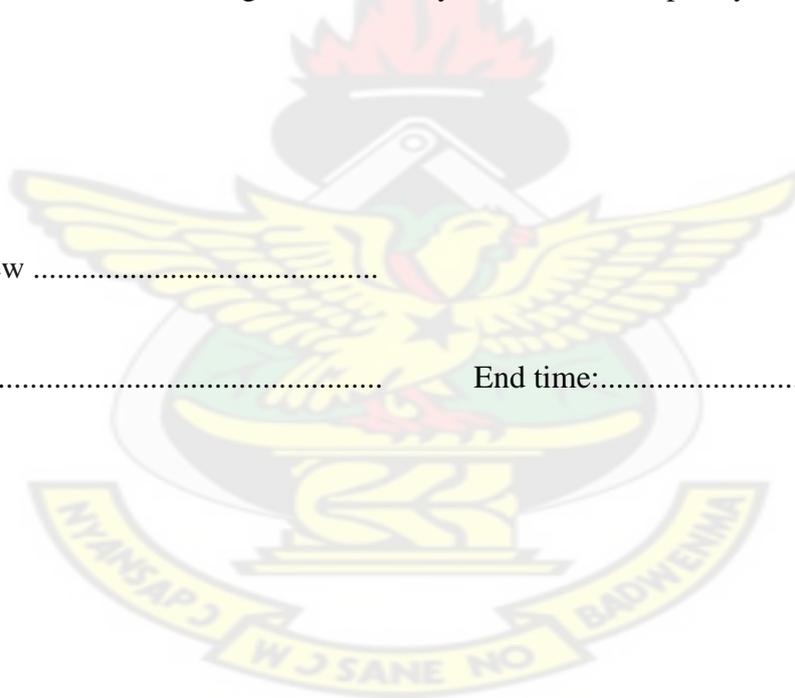
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**Research Topic:**

This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihood in Mining Communities in the Tarkwa Nsuaem Municipality’ toward the partial fulfilment of the requirements of a **PhD in Planning**. Please, I assure you that any information provided would be treated with the deserving confidentiality and be used for purely academic purpose.

Date of Interview .....

Start time:..... End time:.....







**APPENDIX 1D**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

---

**CONCESSION OWNERS, CARETAKERS OR MANAGERS**

**Purpose of Research:**

This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihoods in Mining Communities in the Tarkwa-Nsuaem Municipality toward the partial fulfilment of the requirements of a **PhD in Planning**. You are assured that any information provided would be treated with the deserved confidentiality and would be used purely for academic purpose.

Date of Interview.....

Start time:..... End time:.....

Town / Village .....

**NAME OF GROUP**.....



16. Please, indicate the items you use for your operations and how much do you spend on them per month?

SN.	Item	Amount (GH¢)
1.		
2.		
3.		
4.		
5.		
<b>Total</b>		

**Marketing of ore or gold**

17. Where do you sell the gold or ore?  
 .....

18. How is price determined?  
 .....

**Links with Relevant Agencies**

19. Do you have any relationship with the Ghana Minerals' Commission? a. Yes b. No

20. If yes, what is the nature of the relationship?  
 .....  
 .....

21. Are you satisfied with the relationship? a. Yes b. No

22. If no, what do you expect them to do to enhance your operations?  
 .....  
 .....

23. Do you have any relationship with the Municipal Assembly? a. Yes b. No

24. If yes, what is the nature of the relationship?  
 .....  
 .....

25. Are you satisfied with the relationship? a. Yes b. No

26. If no, what do you expect them to do to enhance your operations?  
 .....  
 .....

27. Do you have any relationship with NGOs? a. Yes b. No

28. If yes, what is the nature of the relationship?  
 .....  
 .....

29. Are you satisfied with the relationship? a. Yes                      b. No

30. If no, what do you expect them to do to enhance your operations?

.....  
.....

31. Do you have any relationship with the University of Mines and Technology? a. Yes b. No

32. If yes, what is the nature of the relationship?

.....  
.....

33. Are you satisfied with the relationship? a. Yes                      b. No

34. If no, what do you expect them to do to enhance your operations?

.....  
.....

35. Do you have any relationship with the PMMC? a. Yes b. No

36. If yes, what is the nature of the relationship?

.....  
.....

37. Are you satisfied with the relationship? a. Yes                      b. No

38. If no, what do you expect them to do to enhance your operations?

.....  
.....

39. What other agencies do you relate?

.....

40. How do you relate to them?

.....  
.....

41. How is your relationship with large scale mining companies?

.....  
.....

**Contribution to the Development of Host Communities**

42. What are your contributions to the development the communities in which you operate?

.....  
.....

**Perceptions**

43. What are some of the beliefs held about the following in your area being in general?

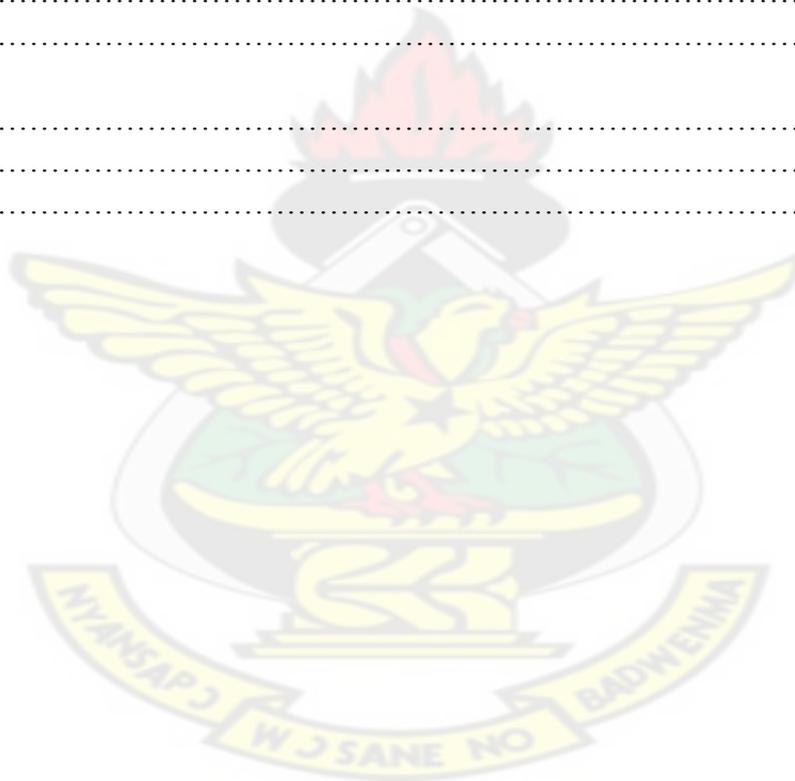
Gold.....  
.....  
.....

Accidents.....  
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Rituals.....  
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.....

Gods.....  
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Any other  
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.....



**APPENDIX 1E**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**QUESTIONNAIRES FOR THE MUNICIPAL HEALTH SERVICE**

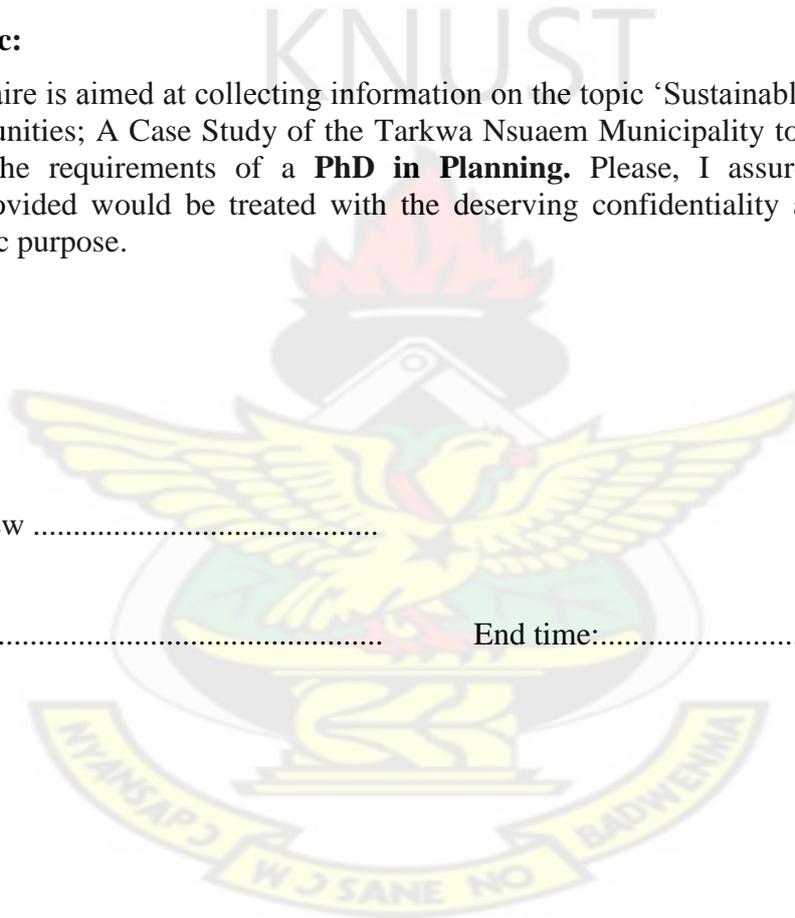
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**Research Topic:**

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Date of Interview .....

Start time:..... End time:.....





- Pharmacists.....
- Medical Assistants.....
- Laboratory Assistants.....
- Others, specify.....

11. What is the patient - bed ratio in the district? .....
12. How many ambulances does the district have? .....
13. How ready is the district for emergency cases such as collapse of mine pits?  
.....  
.....

**Collaboration with DA and NGOs**

14. Do you collaborate with the Municipal Assembly and NGOs to ensure that the effects of mining in the municipality is minimised? a. Yes b. No
15. If yes, in which areas do you collaborate?  
.....  
.....
16. How effective have you been in your efforts to minimise the effects of mining on the inhabitants?  
.....  
.....

**Collaboration with Artisanal Small Scale Miners**

17. Do you collaborate with the artisanal small scale miners in the municipality to ensure that the effects of mining in the municipality is minimised? a. Yes b. No.
18. If yes, in which areas do you collaborate?  
.....
19. How effective have you been in your attempts at minimising the effects of mining on the inhabitants?  
.....  
.....

**Collaboration with Traditional Authorities**

20. Do you collaborate with the Traditional Authorities in the municipality in ensuring that the effects mining has on the municipality is minimised? a. Yes  
b. No
21. If yes, in which areas do you collaborate?

.....  
22. How effective have you been in your attempts to minimise the effects of mining on the inhabitants?

.....  
.....

23. What challenges do you face in the various collaborations?

.....  
.....

24. What challenges do you face in relation to mining in the Municipality?

.....  
.....  
.....

25. What must be done to manage the challenges?

.....  
.....



**APPENDIX 1F**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**GHANA EDUCATION SERVICE (MUNICIPAL OFFICE)**

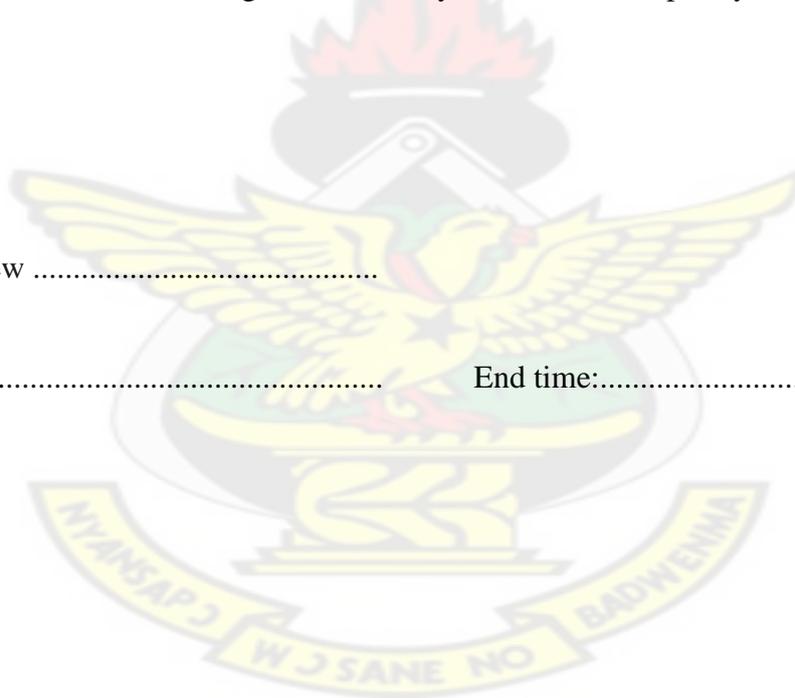
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**Research Topic:**

This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihood in Mining Communities in the Tarkwa Nsuaem Municipality’ toward the partial fulfilment of the requirements of a **PhD in Planning**. Please, I assure you that any information provided would be treated with the deserving confidentiality and be used for purely academic purpose.

Date of Interview .....

Start time:..... End time:.....



1. How many public and private do you have at the various levels in the municipality?

	Public	Private
Basic	.....	.....
• Nursery	.....	.....
• Primary	.....	.....
• JHS	.....	.....
Secondary	.....	.....
• SHS	.....	.....
• Vocational	.....	.....
• Technical	.....	.....
Tertiary	.....	.....

2. What is the school performance rate of pupils or students in the municipality?

.....  
.....

3. What is the school performance rate of pupils or students in artisanal small scale mining communities in the municipality?

.....  
.....

4. What is the school drop-out rate

a. within the municipality ?

.....  
.....

b. In artisanal small scale mining communities

.....  
.....

5. What some of the challenges that educational institutions in artisanal small scale mining communities face?

.....  
.....

6. What is the relationship between educational institutions and

a. Artisanal small scale mining companies or group?

.....  
.....

b. Large scale mining companies

.....  
.....

7. What is the impact of mining on education in the municipality?

a. Positive impact

.....  
.....

b. Negative impact

.....  
.....

8. What measures have been put in place to address the negative impact of mining on education in the municipality?

.....  
.....  
.....

KNUST



**APPENDIX 1G**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**GOLDFIELDS GHANA LIMITED**

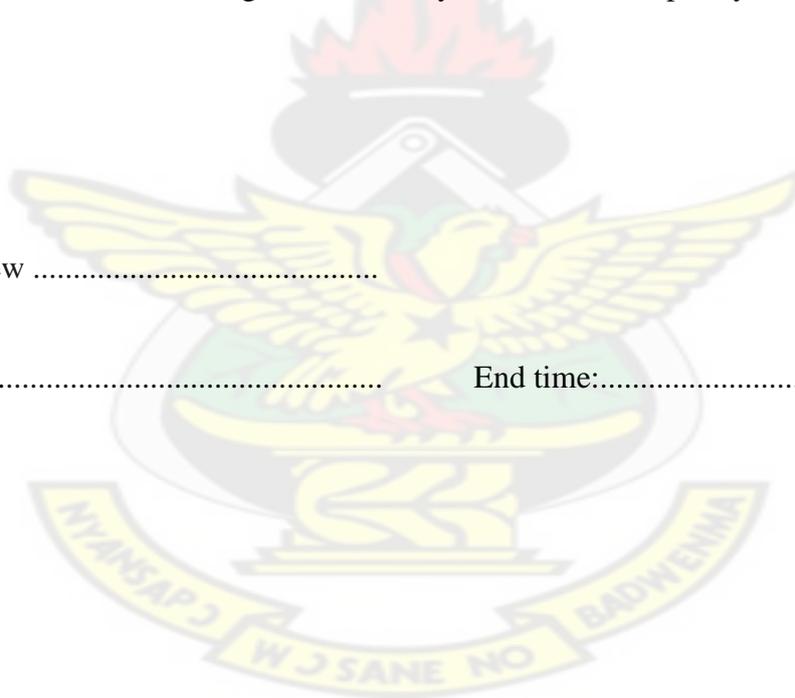
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**Research Topic:**

This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihood in Mining Communities in the Tarkwa Nsuaem Municipality’ toward the partial fulfilment of the requirements of a **PhD in Planning**. Please, I assure you that any information provided would be treated with the deserving confidentiality and be used for purely academic purpose.

Date of Interview .....

Start time:..... End time:.....





**APPENDIX 1H**

**DEPARTMENT OF PLANNING  
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KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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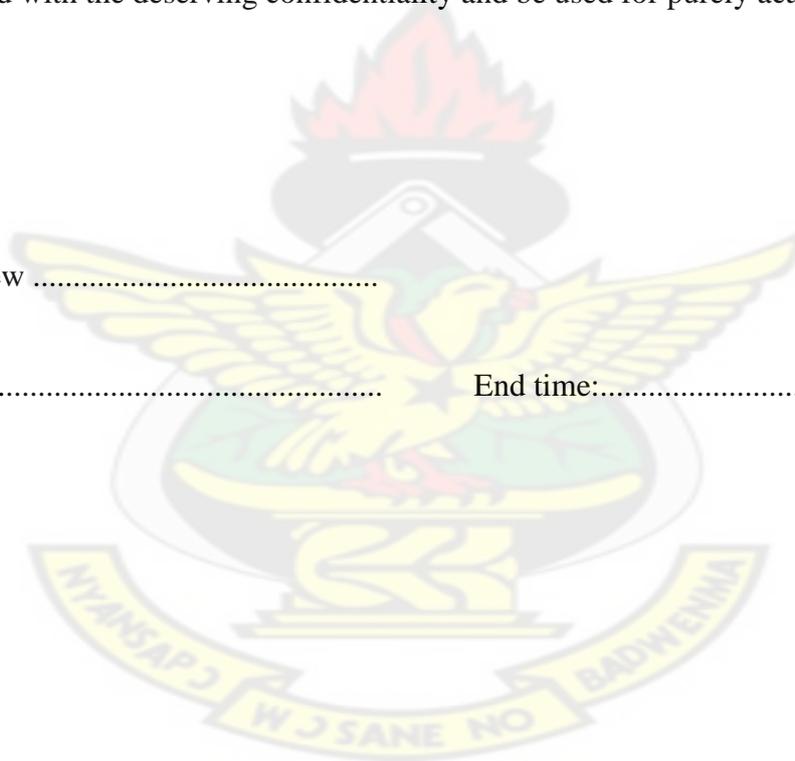
**LANDS COMMISSION (MUNICIPAL OFFICE)**

**Research Topic:**

This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihood in Mining Communities in the Tarkwa Nsuaem Municipality’ toward the partial fulfilment of the requirements of a **PhD in Planning**. Please, I assure you that any information provided would be treated with the deserving confidentiality and be used for purely academic purpose.

Date of Interview .....

Start time:..... End time:.....



**Land Acquisition within the Municipality**



13. What are the reasons for the above chosen answer?

.....  
.....

**Collaboration with Artisanal Small Scale Miners**

14. Do you collaborate with the artisanal small scale miners in the municipality to reduce the negative impact of artisanal small scale mining?

- a. Yes
- b. No.

15. If yes, in which areas do you collaborate?

.....  
.....

16. How do you assess the effectiveness of such collaboration?

- a. Very Good
- b. Good
- c. Average
- d. Below Average

17. What are the reasons for the above chosen answer?

.....  
.....

**Collaboration with Traditional Authorities**

18. Do you collaborate with the Traditional Authorities in the municipality to reduce the negative impact of ASM activities in the municipality?

- a. Yes
- b. No

19. If yes, in which areas do you collaborate?

.....  
.....

20. How do you assess the effectiveness of such collaboration?

- a. Very Good
- b. Good
- c. Average
- d. Below Average

21. What are the reasons for the above chosen answer?

.....  
.....

22. In your view, how can the commission help to reduce land related problems in the ASM communities in the municipality?

.....  
.....  
.....

## APPENDIX 11

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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### **LOCAL BUYING AGENTS**

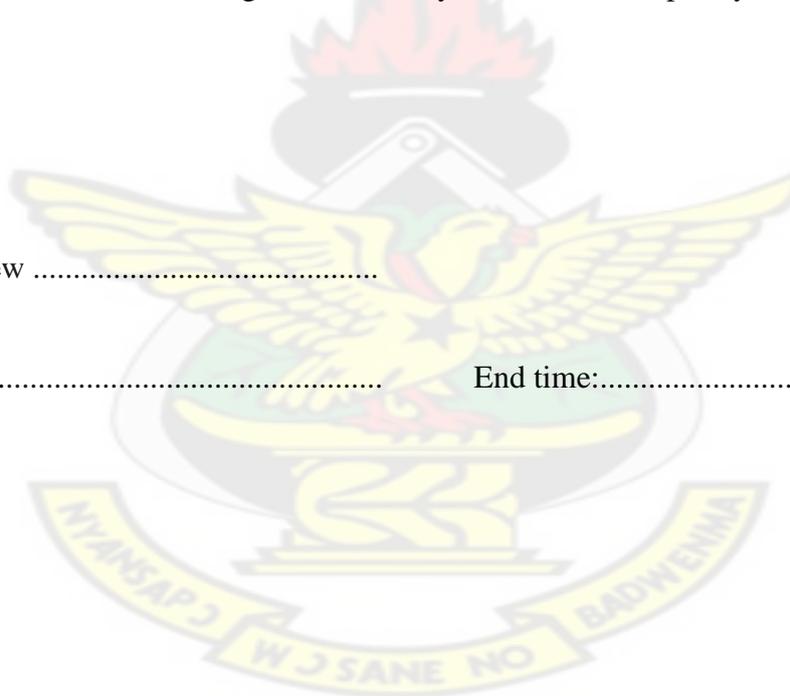
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**Research Topic:**

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Date of Interview .....

Start time:..... End time:.....





.....  
.....  
15. How is the quality of gold determined?

.....  
.....

16. How is the price of gold determined?

.....  
.....

17. Do you deal with individuals or groups of artisanal small scale miners?

- A. Groups                      b. Individuals                      c. Both

18. What is the average age of your customers?

.....  
.....

19. Do you have your own refinery?

- a. Yes                      b. No

20. If yes, what type of technology do you use?

.....  
.....

21. What measures have you put in place to protect the environment in which you operate?

.....  
.....

22. Do you have an association of local buying agents?

- a. Yes                      b. No

23. If yes, what contributions have you made to the development of mining communities in the municipality?

.....  
.....  
.....

**APPENDIX 1J**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**MINERALS COMMISSION**

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**Research Topic:**

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Date of Interview .....

Start time:..... End time:.....

**Mining Concession**



.....  
.....

**Impact of Mining Activities on the Environment and Socio-economic development**

12. What is the impact of mining on the environment?

.....  
.....

13. What measures have been put in place to curb the impact of mining activities on the environment?.....

.....  
.....

14 . To what extent does the commission collaborate with the EPA?

.....  
.....

15. What has been the impact of small scale mining on the employment sector?

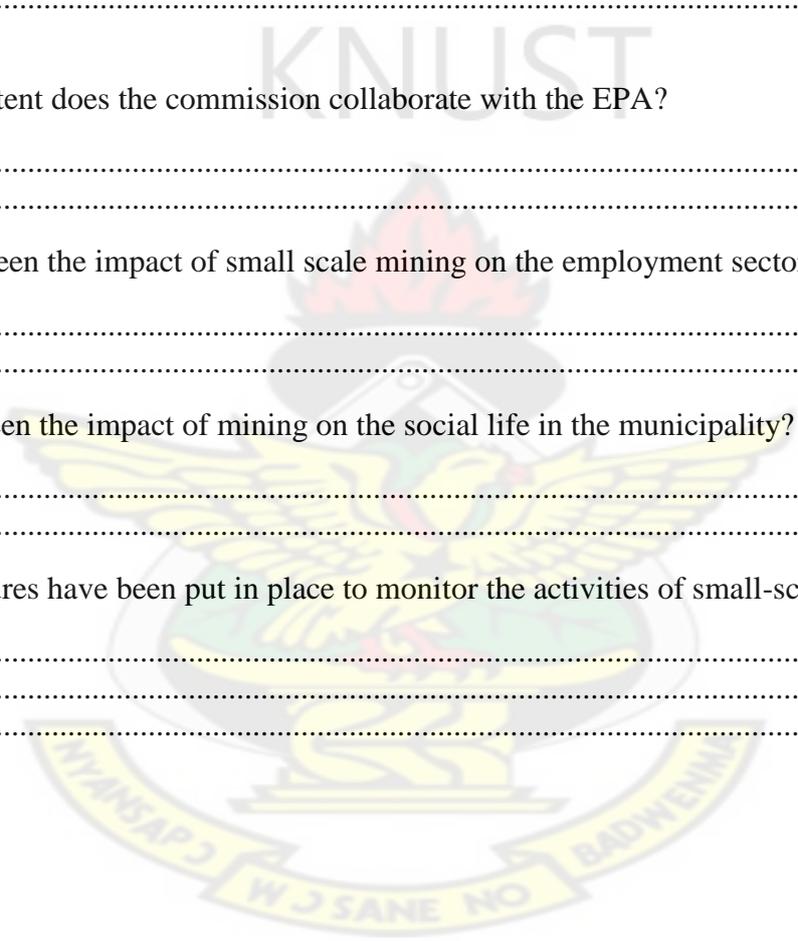
.....  
.....

16. What has been the impact of mining on the social life in the municipality?

.....  
.....

18. What measures have been put in place to monitor the activities of small-scaled miners?

.....  
.....



**DEPARTMENT OF PLANNING**  
**COLLEGE OF ARCHITECTURE AND PLANNING**  
**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**MINISTRY OF FOOD AND AGRICULTURE**

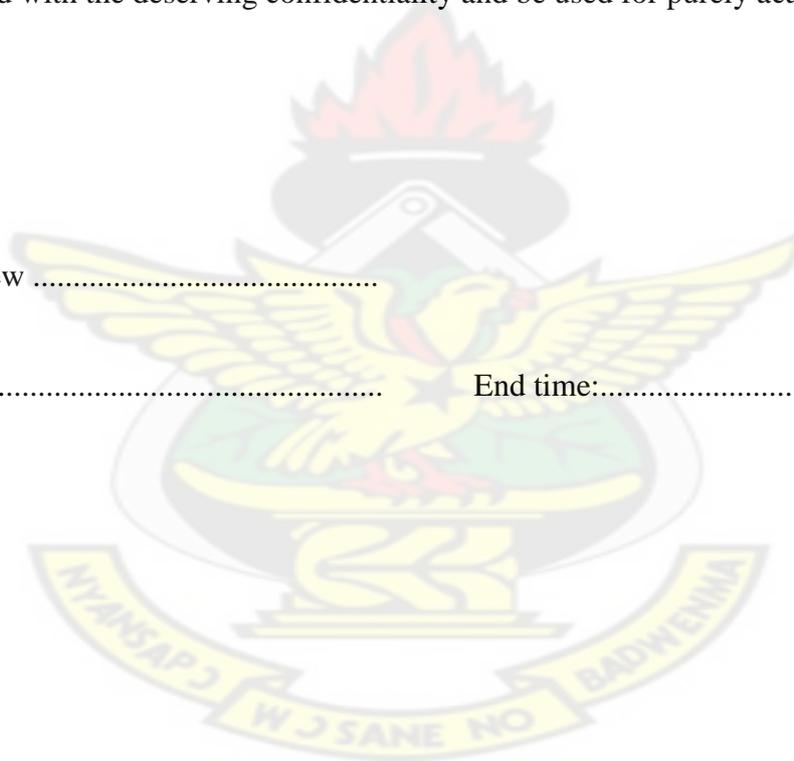
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**Research Topic:**

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Date of Interview .....

Start time:..... End time:.....



1. What are the activities of your office?

.....  
.....  
2. What are your areas of operation?  
.....  
.....

3. What is your staff population?  
.....  
.....

4. What is the impact of mining on agriculture in the municipality?

a. Farmers  
.....  
.....

b. Yield  
.....  
.....

c. Types of crops cultivated  
.....  
.....

d. Major crops cultivated  
.....  
.....

e. Farm size  
.....  
.....

5. What is the average age of people in agriculture within the Municipality?  
.....  
.....

6. What is the proportion of

a. Men.....  
.....

b. Women.....  
.....

7. What type of training do you give to farmers on

a. Crops

b. Equipment

c. Harvesting

d. Post harvest

e. Storage

8. Accessibility

a. Farm gate to market centre.....  
.....

b. Market centre to farm gate.....  
.....

9. What is the land tenure system in the municipality?  
.....  
.....

10. What is the average income of farmers?  
.....  
.....



**APPENDIX 1L**

**DEPARTMENT OF PLANNING  
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KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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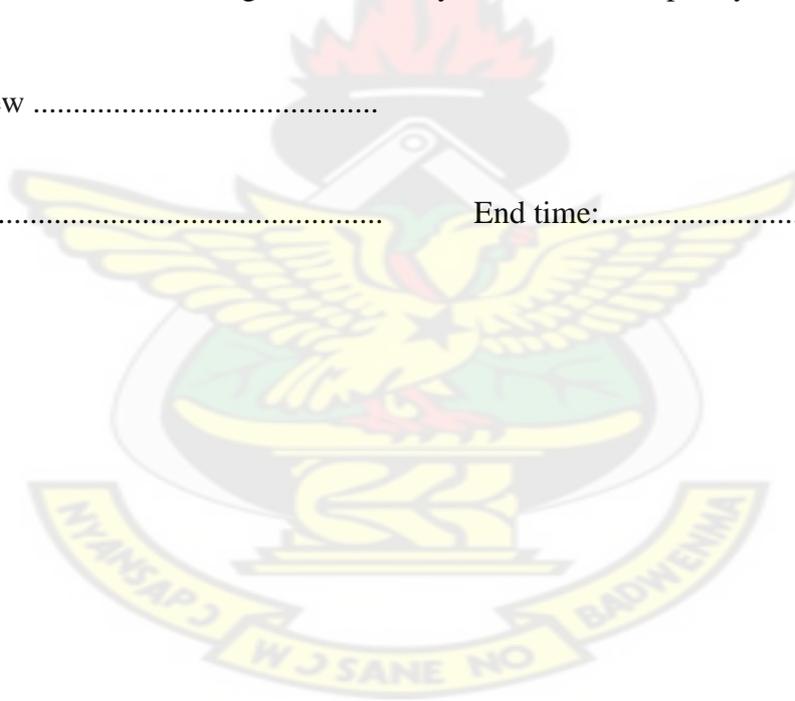
**TARKWA-NSUAEM MUNICIPAL ASSEMBLY**

**Research Topic:**

This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihood in Mining Communities in the Tarkwa Nsuaem Municipality’ toward the partial fulfilment of the requirements of a **PhD in Planning**. Please, I assure you that any information provided would be treated with the deserving confidentiality and be used for purely academic purpose.

Date of Interview .....

Start time:..... End time:.....



1. What is the dominant occupation in the Municipality?  
.....  
.....
  
2. What proportion of the working population is engaged in
  - a. Agriculture .....
  - b. Industry .....
  - c. Commerce .....
  - d. Others .....
  
3. What is the impact of mining on the livelihoods of
  - a. men .....
  - .....
  - .....
  - .....
  - .....
  - b. women.....
  - .....
  - .....
  - .....
  
4. How is the municipal assembly involved in the determination and distribution of compensation?.....  
.....  
.....  
.....  
.....
  
5. How are communities involved in the determination of compensation?  
.....  
.....  
.....

**Collaboration with Artisanal Small Scale Miners**

6. What is the nature of collaboration between the Municipal Assembly and
  - a. Artisanal small scale mining groups?  
.....  
.....
  - b. Large Scale mining groups.....  
.....  
.....
  
7. How does the assembly monitor the activities of artisanal small scale mining groups in the municipality?.....

.....  
.....  
.....  
8. How are mine host communities involved in the allocation of concessions?

.....  
.....  
.....

9. What measures have been put in place to ensure that mine host communities have sustainable livelihoods?.....

.....  
.....  
.....

10. What projects have been undertaken by the mining companies for host communities?

Company	Project	Community
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

11. How are the communities involved in the identification and implementation of the projects?.....

.....  
.....  
.....  
.....

12. How would you assess the contribution of artisanal small- scale mining companies towards the development of the municipality?

- a. Satisfactory
- b. Good
- c. Very good
- d. Poor
- e. Very poor

13. Give reasons for any chosen response to question 12.

.....  
.....  
.....  
.....

**Relationship between Communities and Artisanal Small-scale Mining Companies**

14. Do communities resist the operations of Artisanal Small-scale Mining Companies?

- a. Yes
- b. No



**APPENDIX 1M**

**DEPARTMENT OF PLANNING  
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KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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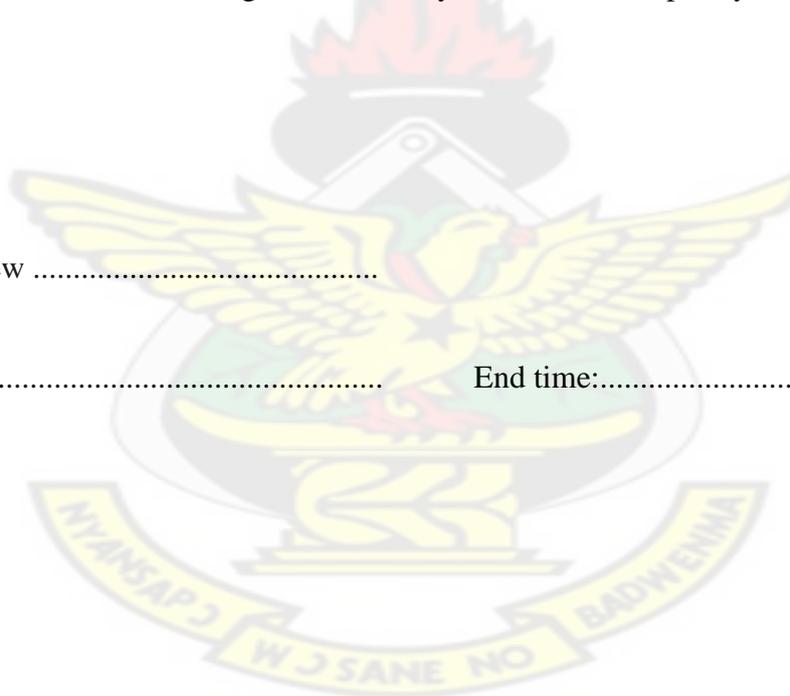
**MUNICIPAL POLICE/SECURITY SERVICES**

**Research Topic:**

This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihood in Mining Communities in the Tarkwa Nsuaem Municipality’ toward the partial fulfilment of the requirements of a **PhD in Planning**. Please, I assure you that any information provided would be treated with the deserving confidentiality and be used for purely academic purpose.

Date of Interview .....

Start time:..... End time:.....



1. What are your major roles in maintaining peace and order in mining communities?  
.....  
.....
2. What is the security situation in artisanal small scale mining communities?  
.....  
.....  
.....
3. What specific activities have you undertaken to ensure security in artisanal small scale mining communities within the municipality ?  
.....  
.....
4. How have artisanal small scale mining communities responded to your activities in maintain law and order?  
.....  
.....
5. What is your relationship with the following in maintaining law and order in artisanal small scale mining communities? Please complete the table below.

Institution	Relationship
Municipal Assembly	
Traditional Authorities	
Civil Society organisations	

6. What problems do you face in maintain law and order in in artisanal small scale mining communities?  
.....  
.....
7. How are these problems dealt with?  
.....  
.....

**APPENDIX 1N**

**DEPARTMENT OF PLANNING  
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KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**QUESTIONNAIRES FOR NGOs**

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**Research Topic:**

This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihood in Mining Communities in the Tarkwa Nsuaem Municipality’ toward the partial fulfilment of the requirements of a **PhD in Planning**. Please, I assure you that any information provided would be treated with the deserving confidentiality and be used for purely academic purpose.

Date of Interview .....

Start time:..... End time:.....

Name of Organisation .....

Location of the organisation .....

1. When did you start your operations in the Municipality?  
.....  
..
2. What are your areas of interest?  
.....  
.....
3. What motivated you to establish an office in this area?  
.....  
.....  
.....
4. What motivated you to establish an Office in this municipality  
.....  
.....  
.....
5. What major projects have you undertaken in the Municipality?  
.....  
.....  
.....
6. What have been the impacts of the projects?  
.....  
.....  
.....
7. How are these projects maintained?  
.....  
.....  
.....
8. Do you organise health programmes in the mining communities? a. Yes    b. No
9. If yes, what have been the impacts of the health programmes?  
.....  
.....  
.....
10. Do you organise educational programmes in the mining communities? a. Yes    b. No
11. If yes, what have been the impacts of the educational programmes?

.....  
..  
12. Do you have any relationship with small scale miners? a. Yes      b. No

13. If yes, how?

.....  
.....  
.....  
14. What is your relationship with the Municipal Assembly in your programming?

.....  
.....  
.....  
**Relationship with Other Institutions/Organisations**

15. Do you have any relationship large scale mining companies?

.....  
.....  
.....  
16. What is the nature of the relationship?

.....  
.....  
.....  
17. How do you relate to other NGOs in the municipality?

.....  
.....  
.....  
18. Do have any relationship with Traditional Authorities?

.....  
.....  
.....  
19. What is the nature of the relationship?

.....  
.....  
.....  
20. Do you have any relationship with the Environmental Protection Agency (EPA)?

.....  
.....  
.....  
21. What is the nature of the relationship?

.....  
.....  
.....  
22. How satisfied are you with the relationship?

23. What reasons do you assign to the answer above?

.....  
.....  
.....

24. Do you have any relationship with Pressure Groups?

.....  
.....

25. What is the nature of the relationship?

.....  
.....  
.....

26. What are the major problems in the ASM communities?

.....  
.....  
.....

**Sustainable Livelihood**

27. Do you have any livelihood oriented programmes? If yes please outline them

.....  
.....  
.....

28. Do you have any training programme in capacity building of miners in the municipality? If yes what are they?

29. What are the successes and challenges in the capacity building programmes?

.....  
.....  
.....

30. As an organisation, what suggestions will you make to ensure that livelihoods are sustained in the municipality?

.....  
.....  
.....

**Impact of mining**

31. Has mining influenced the cultural values in the municipality?

.....  
.....  
.....

32. How has mining affected Education in the municipality?

.....  
.....  
.....

33. How has mining affected social networks in the municipality?

.....  
.....  
.....

34. Has mining brought raised any security issues in the municipality? If yes, please explain.

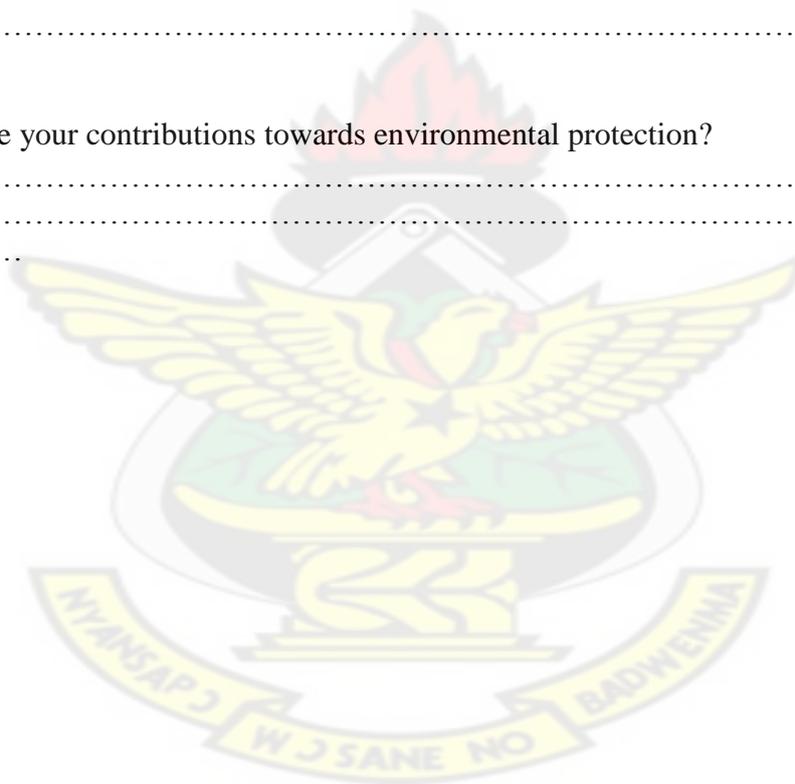
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.....

35. Are there any environmental issues/concerns in the municipality attributable to mining? If yes, please outline them.

.....  
.....  
.....

36. What are your contributions towards environmental protection?

.....  
.....  
.....



**APPENDIX 10**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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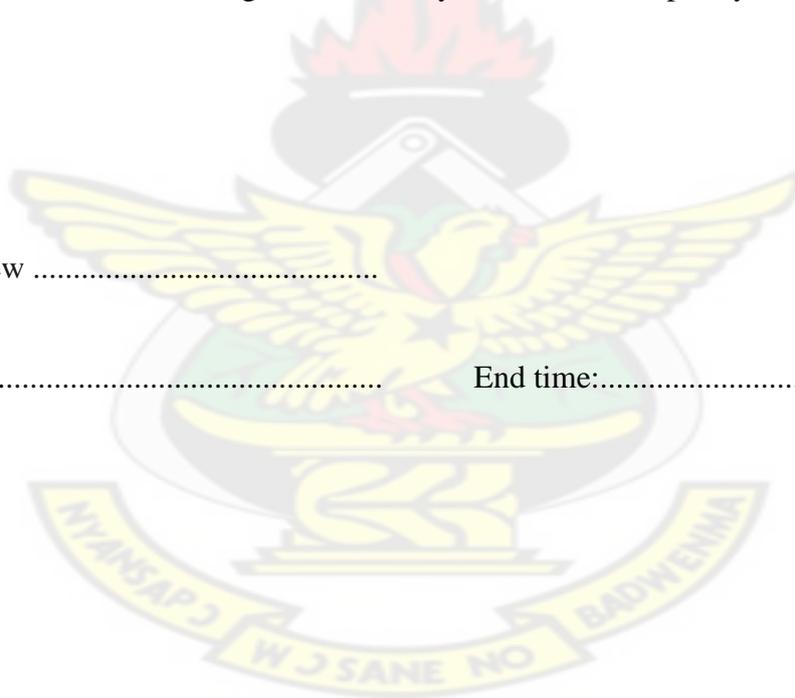
**PRECIOUS MINERALS MARKETING CORPORATION**

**Research Topic:**

This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihood in Mining Communities in the Tarkwa Nsuaem Municipality’ toward the partial fulfilment of the requirements of a **PhD in Planning**. Please, I assure you that any information provided would be treated with the deserving confidentiality and be used for purely academic purpose.

Date of Interview .....

Start time:..... End time:.....





15. How is the quality of gold determined?  
 .....
16. How is the price of gold determined?  
 .....
17. Apart from the local buying agents, do you deal with individuals or groups of artisanal small scale miners?  
 B. Groups                      b. Individuals                      c. Both
18. Do you buy gold from galamsey groups?  
 .....
19. How do you pay your customers?  
 a. Cash              b. Cheque              c. Directly into the bank accounts of customers
20. When do you pay customers?  
 a. Immediately              b. later
21. Do you have your own refinery?  
 b. Yes                      b. No
22. If yes, what type of technology do you use?  
 .....
23. What measures have you put in place to protect the environment in which you operate?.....
24. What is your relationship with artisanal small scale miners?  
 .....
25. What is your relationship with the minerals commission?  
 .....
26. What measures have you put in place to ensure that the amount of gold purchased per month increases?  
 .....

**APPENDIX 1P**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**QUESTIONNAIRE FOR THE ENVIRONMENTAL PROTECTION AGENCY**

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**Research Topic:**

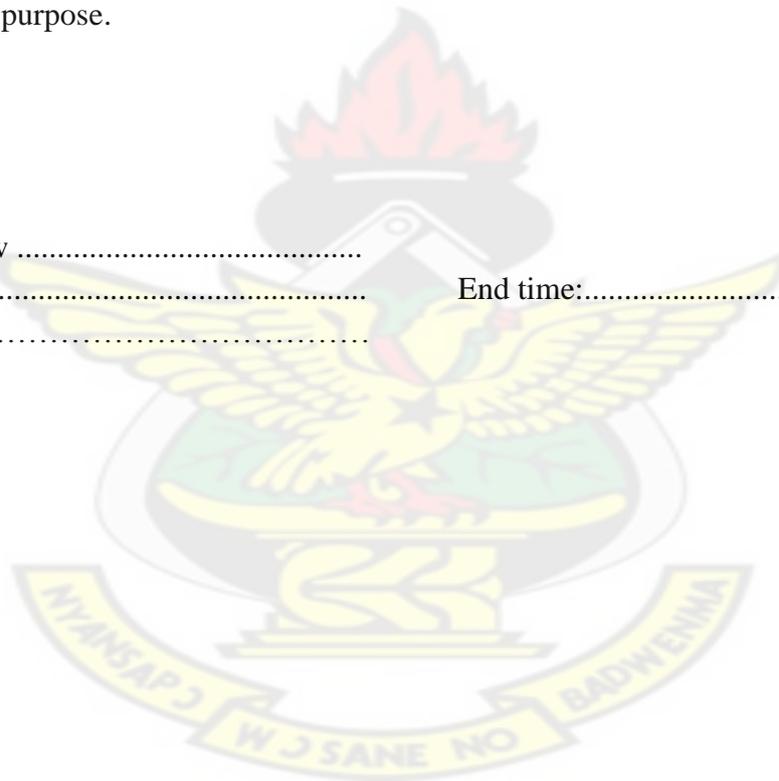
This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihoods in Mining Communities; A Case Study of the Tarkwa Nsuaem Municipality toward the partial fulfilment of the requirements of a **PhD in Planning**. Please, I assure you that any information provided would be treated with the deserving confidentiality and be used for purely academic purpose.

Date of Interview .....

Start time:.....

End time:.....

Town / Village .....



1. When was the Agency established in the municipality?

.....

2. What are the major areas of operation of the Agency?

.....

.....

3. How is the Agency involved in the allocation of concessions?

.....

.....

4. What are the major environmental problems in the Municipality?

.....

.....

5. Do you receive complaints on environmental issues from

a. individuals

b. Groups

c. Communities

6. What are the major challenges of the Agency?

.....

.....

7. What is the extent of damage caused mining activities?

.....

.....

8. How do you monitor the activities of mining companies?

.....

.....

9. What is the relationship between the Agency and the

a. Minerals commission

.....

.....

b. The Municipal Assembly

.....

10. What measures have been put in place to ensure the sustainability of the Environment?

.....  
.....

KNUST



**APPENDIX 1Q**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**QUESTIONNAIRE FOR RELEVANT EDUCATIONAL INSTITUTIONS**

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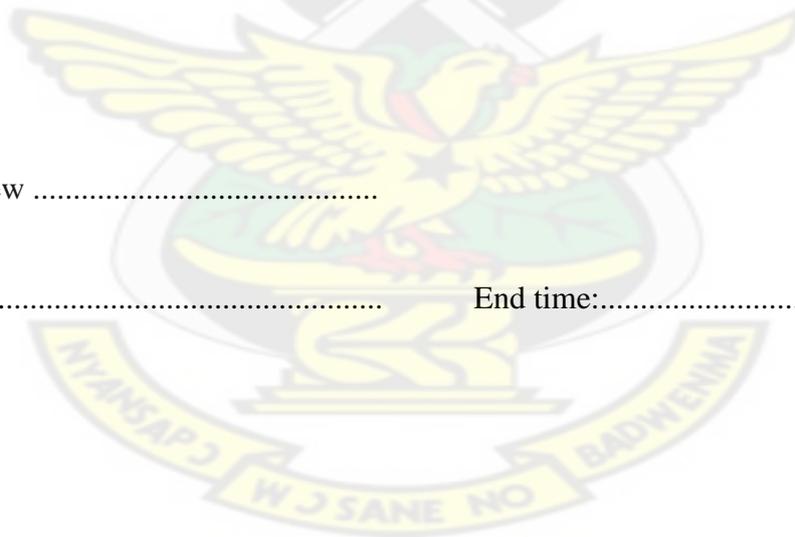
KNUST

**Research Topic:**

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Date of Interview .....

Start time:..... End time:.....



1. What is the institution's contribution to the mining sector?

.....  
.....

2. What is your relationship with

a. Artisanal Small- Scale Mining Companies

.....  
.....

b. Large Scale Mining Companies

.....  
.....

3. Is the institution involved in any consultancy work within the mining sector?

[ ] Yes [ ] No

4. If yes, how? .....

5. What are the collaborating agencies that you work with?

.....

### **Introduction of New Technology**

6. Have you introduced any new technology to the mining sector?

[ ] Yes [ ] No

7. If yes, what is it?

.....  
.....

8. Which sector of the mining industry was it introduced to?

.....  
.....

9. How was it introduced?

.....  
.....

10. What was the attitude of the miners towards the new technology?

.....  
.....

11. How much did it cost to introduce the technology?

.....  
.....  
.....

12. To what extent is the technology expected to improve the livelihoods of the miners?

.....  
.....

13. What are the effects of mining on the environment in the municipality?

.....  
.....

14. How can this be minimized?

.....  
.....

15. How can illegal mining be prevented in the municipality?

.....  
.....

16. What recommendation would you like to make on sustainable livelihoods in mining communities within the Tarkwa Municipality?

.....  
.....

**APPENDIX 1R**

**DEPARTMENT OF PLANNING  
COLLEGE OF ARCHITECTURE AND PLANNING  
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI**

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**GHANA WATER COMPANY**

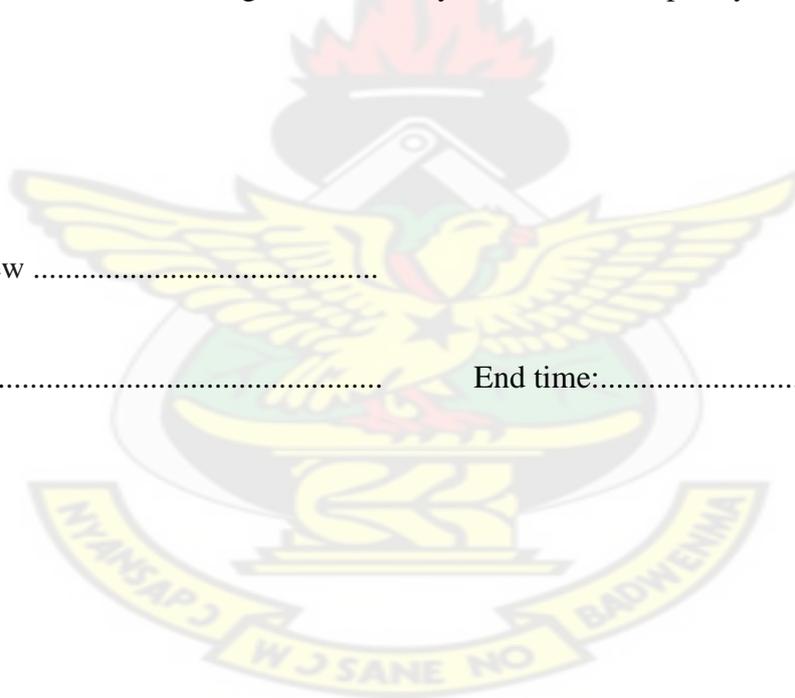
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**Research Topic:**

This questionnaire is aimed at collecting information on the topic ‘Sustainable Livelihood in Mining Communities in the Tarkwa Nsuaem Municipality’ toward the partial fulfilment of the requirements of a **PhD in Planning**. Please, I assure you that any information provided would be treated with the deserving confidentiality and be used for purely academic purpose.

Date of Interview .....

Start time:..... End time:.....





**Collaboration with Artisanal Small Scale Miners**

14. Do you collaborate with the artisanal small scale miners in the municipality to ensure that the effects of mining on water supply in the municipality is minimised?

- a. Yes
- b. No.

15. If yes, in which areas do you collaborate?

.....  
.....

16. How do you assess the effectiveness of such collaboration?

- a. Very Good
- b. Good
- c. Average
- d. Below Average

17. What are the reasons for the above chosen answer?

.....  
.....

**Collaboration with Traditional Authorities**

18. Do you collaborate with the Traditional Authorities in the municipality in ensuring that the effects ASM has on water supply in the municipality is minimised?

- a. Yes
- b. No

19. If yes, in which areas do you collaborate?

.....  
.....  
.....

