AN ASSESSMENT OF OCCUPATIONAL HEALTH AND SAFETY UPTAKE AMONG ARTISANAL MINERS IN GHANA

BY

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DECLARATION

I hereby declare that thesis submitted is my own work towards the Masters of Business Administration (Strategic Management and Management Consulting – Option) and that, to the best of my knowledge, it contains no material previously published by another person or material which has been accepted for the award of any other degree in any University, except where due acknowledgment has been made in the text.

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DEDICATION

This work is dedicated to to my wife Araba Stephens and Children, Joel, Daniel, Babina, Nathaniel and Kate.

It is also dedicated to Francis and Gordon of Business School, KNUST for their encouragement and Support towards the achievement of this report.

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ABSTRACT

Artisanal mining has attracted global significance because of its potential to contribute to sustainable livelihoods. Also, artisanal mining is one of the most complex economic sectors of Ghana, but the clear understanding of the country's Occupational Health and Safety (OHS) management in this mining business is missing. This calls for the need for studies in the area so that the findings could be used to inform policy makers in the sector to help enhance the occupational health and safety practices uptake in the sector. Data was collected from one hundred and thirty participants using questionnaires and this was analyzed using the Statistical Package for Social Sciences(SPSS). It was found that most of the workers who engage in artisanal mining business activities in Ghana are males with just little participation being females. Also, people from the age range between 1 to 35 years are those who actively engage in artisanal mining in Ghana. Physical hazards, psychosocial hazards and ergonomic hazards were found to be among the common and most frequently occurring occupational health and safety issues in the Ghanaian artisanal mining business sector. It was also discovered that management commitment is negatively related to occupational health and safety practices. It was recommended based on the findings that steps must be taken by the Ministry of Mines and Natural Resources to determine efficient and effective measures aimed at identifying all the artisanal miners in the various locations across the country. This would particularly be very helpful to both the Ministry of Finance and Ghana Revenue Authority to rake in additional unreported revenue from these artisanal miners.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

In the mining sector, artisanal mining is one of the complex economic sub-sectors of Ghana. However the clear comprehension of the country's occupational Health and Safety (OHS) management is missing in the mining sector. Artisanal Mining has attracted global significance due to its capability to add economical and sustainable livelihood. Notwithstanding, the sector is engulfed with serious challenges of occupational health and safety issues concerning not only with those directly involved in the mining operational processes but also to the entire communities around and environment at large.

Mining and its operations have lately been a major focus of communities and national concern due to its contributions of causing most morbidities and mortalities in mining communities (ILO Report, 2010). Artisanal mining activities obviously exposes workers and the entire mining community to such risks as presented by the use of explosives, chemicals, pebbles and dust generated, caved pits, unfilled pits and serious injuries in the course of mining activities. Not these alone, mining communities are also exposed to various physical, chemical, mechanical and psychosocial risk factors (ILO Report, 2010). To be able to deal with these challenges of Occupational Health and Safety (OHS) among artisanal mining sector, comprehensive precautions with its associated occupational health and safety promotion activities have to be taken so as to limit the higher risk of Occupational Health and Safety hazards.

The rates of fatality associated with artisanal mining is evaluated to be ninety times more than the rates occurring in the large scale mining within the industrialized nations. Despite this large fatality rates associated with artisanal mining there are no formal reporting opportunities put in place in the sector. In the artisanal mining sub-sector, the information background of Occupational Health and Safety issues is very limited. Also, the relevance of using Personal Protective Equipment (PPE) including such items like helmets, dust mask and machine guarding shields is not properly understood.

The mining regulation process of Ghana is generally prescriptive and a significant issues facing the Mineral Commission Inspectorate are that whereas some of the artisanal mining businesses are legal, most of them are actually illegal. The intrusion of various foreigners most especially the Chinese into the sector have even made the situation much complicated. Government is concentrating in formalizing the artisanal mining sub-sector by empowering the development of co-operate groups of miners to work at the same concession in order for them to benefit the knowledge management systems and Occupational Health and Safety systems that would be implemented.

One of the most prominent challenges in the artisanal mining sector is non-adherence to the standards of Occupational Health and Safety. As noted by Hentschel et al. (2002), most of the artisanal mining activities are known to lack safety regulations, awareness of risk inherent in mining, reinforcement of the mine safety requirements as well as access to proper mining equipment. The risk factor in the artisanal mining gives higher Occupational Health and Safety risk which result in unfavorable working conditions as compare to the formal or the large -scale mining.

1.2 Problem Statement

The fact that the mining industry has become very crucial in the development of Ghana and for a long time, these industries has been experiencing global shocks and gold price are going down resulting in some mines being shut down in the mining business. There number of challenges results in down turn of the business and Ghana is not an exception. Even though the industry is experiencing this down turn, there is considerable number of growing artisanal mining. As mines are shut down artisanal mining are taking over. Particularly in Ghana, areas such as Obuasi, Tarkwa, Bogoso, Dunkwa, Wassa Amenfi, Prestea and some part of Eastern region. The issues of artisanal mining has become tropical against the back ground that there are number of increasing occurrences of accidents and sometimes deaths in the artisanal mining sector. Occupational Health and Safety in artisanal mining sector has become very tropical even though the recent prorogation of laws in Ghana to regulate the operations of artisanal mining has taken into Occupational Health and Safety (OHS) and Corporate Social Responsibility (CSR) in particular, however, it seems they are actually not being taken care of. Also very crucial situation is that, these artisanal mining are owned by big business men and even there is intrusion of foreign investors especially the Chinese who show blind eye to the Occupational Health and Safety (OHS) to the detriment of these artisanal miners.

During the operation of these artisanal mining, there is increase number of death tolls as a result of miners being buried in cave pits, people work with chemical without any Personal Protective Equipment's such as gloves, nose mask, helmet and right tool for task. They almost clothed with death as a result of the mining activities. The question is; who think of the operations of these artisanal miners? It is against

this background that a study is set out to conduct an assessment of Occupational Health and Safety uptake among Artisanal Mining Sector in Ghana.

1.3 Objectives of the Study

1.3.1 Broad Objectives

The overall objective of the study is to assess the uptake of Occupational Health and Safety (OHS) uptake among artisanal mining sector in Ghana.

1.3.2 Specific Objectives

1. To examine the operational activities of artisanal mining sector in Ghana.
2. To examine the Occupational Health and Safety issues that are common in the artisanal mining sector of Ghana.
3. To identify the Occupational Health and Safety practices that exist in the artisanal mining sector of Ghana.
4. To examine the factors that influences the uptake of Occupational Health and Safety practices among artisanal miners in the selected communities in Ghana.

1.4 Research Questions

The study generally aims to answer the following research questions;

1. What are the operational activities in the Ghanaian artisanal mining sector?
2. What are the common Occupational Health and Safety issues prevalent in the artisanal mining sector in Ghana?
3. What are the Occupational Health and Safety practices existing within the artisanal mining sector in Ghana?
4. What are the influential factors of the uptake of Occupational Health and Safety practices among artisanal mining sector in Ghana?

1.5 Justification of the study

According to the International Labour Organization (2012), about 13million people work as artisanal miners to make livelihood and income. Report from the mineral commission indicates that artisanal mining produce 34% of gold output in Ghana. In view of this, it is very important for artisanal miners to overcome the occupational health and safety issues that confront the sector so that gold are delivered safely without any harm. These findings of this research will serve as a valuable guide to the Mineral Commission and Government as a whole so as to highlight and address the challenges of Occupational Health and Safety (OHS) that confront the Ghanaian artisanal mining sector.

1.6 Scope of the Study

The study will be limited to some artisanal mining in Tarkwa, Preastea, Wassa Amenfi, Bogoso, Dunkwa and Obuasi in Western, Central and Ashanti Regions respectively. Conceptually, however, the study will focus on the assessment of Occupational Health and Safety (OHS) uptake among the artisanal mining in the above-mentioned areas.

1.7 Significances of the Study

Among other significance, the research document would provide a database for the district which any artisanal mining is being undertaken. Also, this study will provide empirical evidence for Occupational Health and Safety systems among artisanal miners. Subsequently, the findings of the study will serve as a good references to policy formulation with respect to Occupational Health and Safety (OHS) in the Ghanaian artisanal mining sector.

1.8 Overview of Methodology

The study would obtain both qualitative and quantitative data through survey, interviews and personal observations. Questions relating to the research objectives including some open-ended questions, covering areas, demographics, background information and understanding the Occupational Health and Safety management systems in the artisanal mining operations. The questions in the survey would be based on the literature review

The target population entailed the entire staff including the principals or the owners of the artisanal mining operations. Both stratified and convenience sampling techniques will be used in selecting respondent for the study while the result will be represented using percentages correlation and content analysis.

1.9 Limitations of the study

Several limitations are envision to inhibit the progress of this study. Largely, it is expected that there will be a challenge with the staff regards to the unsafe conditions and unsafe acts practices. Chief among them would be time and financial constraints. These constraints will to some extent influence the number of correspondent selected for the study

1.10 Organization of the Study

Five main chapters are used to organize the study. The background of the study, statement of problem, research objectives, research questions, justification of the study, scope of the study, significance of the study, overview of methods, limitations and organization of the study are all treated in chapter 1. The review of pertinent

literature can be found in Chapter 2. Chapter 3 covers the research procedure, research methods, validity and reliability issues and data analysis methods. Chapter 4 presents the analysis, presentation and discussion of results while chapter 5 covers the summary of the main findings of the study, conclusions and recommendations drawn based on the findings.

CHAPTER TWO

REVIEW OF LITERATURE

2.0 Introduction

Occupational Health and Safety (OHS) are at times, considered as something from the dim. It is really from the age of the steam engine that has been sufficiently managed in the past-post-modern age by means of technological, organizational and regulatory innovations effort. (Frick, Per Langaa et al., 2002). In this manner, the knowledge and the work environment has increase in number of areas but the degree of control of the work environment have not expanded relatively (Frick, Per Langaa et al., 2002).

In Ghana, the Labor (Act 651, 2003) requires that all organizations take proactive risk management approach to manage risks that are connected with their operations. This arrangement of safety measure incorporated with the management and production processes is relied upon to be proportionate with the risk postured by the operation of the enterprise. Meanwhile, according to the World Health Statistics (2011), just about thirteen per cent of the Ghanaian populace in 2008 works or lives in an environment that is protected. Accidents at the working place involve cost for the community and the organizations. This accounts for why various legislations has passed for worker on the job. Such a critical issue must be faced adequately with professionally trained personnel and efficient thorough and rigorous management system.

It is in this light that this chapter reviews Occupational Health and Safety (OHS) management in the mining or extractive sector: global issue in artisanal mining; artisanal mining in Ghana; occupational health and safety management in artisanal mining in Ghana; empirical review or studies on occupational health and Safety

(OHS) management; gabs between what have been studied and what needs to be done; and a conceptual framework.

2.1 Occupational Health and Safety (OHS)

Welfare is characterize as "prosperity" by the Cambridge Advance Learners Dictionary. In this way, Occupational Health and Safety are entirely a component of the welfare of workers which have been distinguished independently as being a significant and different provision currently. Cascio and Wayne (1986) characterized safety hazards to be components of the work environment with the ability to injury to the worker. For example, visual impairment, loss of hearing, or body parts, sprains, cuts, broken bones, wounds, electric stun and smolders. Within the work environment, health hazards are those components that cumulatively and slowly result in deterioration of the health of and employee; for instance, poisoning, cancer as well as respiratory diseases. According to Cole (1991), some of the popular causes include; physical, biological, ergonomic, chemical, Psychosocial, environmental, psychological and radiation hazards (Cole, 1991).

2.2 Occupational Health and Safety Evolution

Between the late 19th and mid-20th century, the priority of most employers was to make profit which lead them to over emphasize that to the neglect of the health and safety of their employees. In real terms, the health of the worker was not a worry to anybody. Injured workers in the U.S needed to take legal action in order to obtain compensation for their injuries. The litigation cost viably kept employee from taking legal actions in the court of law. Also, under the common law, most workers were less successful since it is usually held that the employee knew about the hazards of the job

and also that the injuries are a as result of the carelessness of the worker, the organization was not liable. Based on this background, there have several practices and approaches relating to Occupational Health and Safety issues. In 1913, the National Safety Council was established in the U.S which consists of mindful engineers and manager to spearhead its founding (major disaster led to changes in thinking). In 1959, the International Labor Organization indicated that Occupational Health and Safety (OHS) services centers should be sited close to the work place so as to address the welfare of the worker. The universal work association 1959, gave that word related Occupational Health and Safety services to be created in or near to a position of job for the welfare of the worker (International Labor Organization, 1959).

2.3 Occupational Health and Safety Law

According to Ghana's Labor Act 2003, Act 651 an organization have the accompanying obligatory role:

- Provision of conducive working environment and should be sustained
- Elimination of risk associated with the handling of materials and transportation of substances.
- Provision of important data and guidelines, provide supervision taking into accouts age, the level of proficiency and finally the health and safety of those who engage in that type of work.

Again, the labor Act kept on stipulating that, an employer who, without reasonable excuse, neglects to discharge any of the commitments recorded above liable to an offense and is obligated on summarily conviction to fine not exceeding 1000 penalty units or to a detention for a term not exceeding three years or to both.

2.4 The Concept of Occupational Health and Safety

The existing literature reviews a meanings occupational health and safety, of which greater part of these tend to concentrate on the parts of safety. The word occupational health is concern with two-way relationship, work and health. Kim (2004) is of the perspective that, a position held by a Joint ILO/WHO Committee on Occupational Health is much embracing. Safety involves more than the normal word reference meaning of "free from accident". The World Health Organization, (1999) characterizes safety as a "condition of complete physical, mental and social prosperity and not just the absence of infection or ailment". Hence health and safety refer to the preventing and protecting people from injury and occupational disease in any form due to hazards and risk that may injure, cause unsafe environment to people or damage equipment.

The International Labour organization (ILO, 2003) defined Occupational Health and Safety (OHS) as the sufficient protection or assurance of an employee from harm, injury and infection from work related activities. It is the health and safety status of the workforce in an organization depicts how effective and productive its employees are. It aims at the following:

- Causing reduction in occupational accidents evolving from or over the range of work which results in either deadly or non- fatal injury (ILO, 2003).
- Improving and sustaining of the most elevated level of physical, mental and social well- being of works in all occupations.
- Resistance among workers of adverse effect for with regards to working environment;

- Protection of workers in their livelihood due to poor environmental conditions.

Quansah (2008) suggested that Occupational Health and Safety (OHS) encompasses the social, mental and physical well-being of people, and besides the "entire person". Globally, a greater number of people die at work than in wars (ILO, 2004). The ILO estimated that that every year around 2.3 million men and women from work related incidents and diseases including close to 360,000 fatal accidents and an expected 1.95 million fatal related diseases.

The aim of occupational health is to designed in such a way that it will promote and maintain high degree of physical, mental and social well- being of workers in all occupations. Hammington, (1992) as cited in Kim (2004) indicated that occupational health is tremendously related to the impacts of the workplace on the health of the employee.

Health and safety in the work environment is crucial to ensure that people who contribute to the economic growth are not injure the process of doing the work (Cudjoe, 2011; Bennet, 2011). The benefits of promoting Occupational Health and Safety is allowing people to live more worthwhile lives, reducing demand on health and social service, reducing the cost related to illness, injury on both community and individual and enhancing economic activity (Cudjoe, 2011; Bennet, 2011).

As noted by the International labour Organization (ILO, 2003), health and safety at the work place in an organization is more than wearing safety cloth or helmet. It is the philosophy that identify and remove dangers connected with the work ILO (2003)

further suggest that health and safety discourage employee that are susceptible to injury cause by an accident. Annan (2011) contended, that safety programs should be incorporated in to organizational operations activities.

The Department of Health and Human Service in the U.S noted that, Occupational health refers to the science of designing, implementing and evaluating programs of health and safety that maintain and promote employee's health, improve safety and increase productivity of an organization.

Hughes et al., (2008) stipulated that, health is a sound state of the body and mind of people from illness resulting from materials, processes or procedures used in the workplace, while safety is the protection of people from physical injury. Thus, Occupational Health and Safety can be seen to concern the physical and mental well-being of the individual at a place of work.

2.5 Empirical Review on Studies on Occupational Health and Safety

This part of the study covers the prior works of others on the importance Occupational Health and Safety issues relating to work in an organization. It reviews the literature relating to health and productivity of the worker, highlights experimental proof proposing the improvement of occupational health and safety and also deals with the association between productivity and quality work environment (safe work environment

Adjotor (2013), while working on the effect of Occupational Health and Safety OHS) on the productivity of labour in selected organization in the Greater Accra region of

Ghana, Adjotor (2013) came out with finding on how the employee's health and safety relates to performance.

It is also revealed by Piavi et al. (2008) that due to the weaknesses of the health and safety practices in Ghana, about one thousand eight hundred and fifty two (1,852) casualties were recorded in the year 1998 while this figure increased to nine thousand six hundred and sixty one (9,661) fatalities in the year 2005. This resulted in the casualty rate of 20.6% in the year 1998 per every one thousand workers and grew to 23.6% in the year 2005.

In the year 2002, Steckel established that productivity is affected by the health and safety of the employee. Steckel further noted that with the correlation value of 0.82 and 0.88 between Gross Domestic Product (GDP) reveals that health is a determinant of the productivity of employees. More so, as noted further by Steckel, inequality in the per-capita income in the country could be explained by the imbalances in the health and safety status among people in the country. It was discovered that countries with better health indicators experience higher per-capita income in the work of Steckel (2002) while conducting a cross-country analysis.

In France and Europe, the impact of Occupational Health and Safety on productivity was empirically examined by Fogel, (1991). It was found that improvement of health and safety has an enduring and changing effect on the productivity of the workers in the country. His work was supported by the evidence that health enhancement which started in over three hundred (300) years ago in North-America and Europe has not fully utilize its course and is still of great benefits to those countries. Fogel in Norway

found that the adaptation and enhancement of health and safety measures in the eighteenth century was combined with a decrease in the level of mortality which increase their labour force participation. As a commitment to the idea of health and safety as a determinant of productivity, Steckel in 1983 Stekel, (1983), investigated the association between productivity and height used as a proxy for one's health. Steckel considered the conclusion that the causal relationship between productivity and health which was said to be of one direction from health to per-capita income illustrates the fact that health and safety affects productivity.

According to Weil, concerning the idea of linkage amongst productivity and health, it was discovered that 17% variation of an employee's output can be attributed to the health and safety variations. Schultz in the year 2002 utilized an Ordinary Least Square (OLS) estimation technique by social event information involving three countries including Brazil, Ghana and the USA. The results from the cross-country analysis showed that a unit variation in health stock which was proxied by height is connected with about 8 – 10 enhancement in the wages of a person. Also, Knapp in 2007 while conducting a study to determine the effect of health on the productivity of labour, it was discovered that the enhancement of net-nutrition in the first 20 years of a person causes a positive and significant impact on an individual's level of productivity.

The culture of organization safety also improves the efficiency of its employees in the organization which in turn enhance the productivity of its employees. Brenner (2004) attested his research to the fact that employees who work in an organization with

better safety measures are more productive than those organization with less safety measures.

According to Akinyele (2007), safe environment creates safety innovation and enhance health of its employees. The clear impact of unhealthy or unsafe work is the direct impact of on the level of productivity. He assessed that about thirty six thousand (36,000) are injured yearly, and 16 kill, these cause decrease in output levels because of the reduction in productive lives.

According Pettinger, roughly 200 billion US dollars are spent every year by employers in connection with the cost of injury alone. These expenditure are to a great extent as compensation wages and insurance premiums paid to either the employee's family or to the employee directly. Because of the low reporting incidents within the work place, the figures could even be higher than what is being assessed.
Bunn et al. (2002) while researching to determine the underlying causes of disease and injury at work is as well-known as the research into the cost of occupational injury and diseases. Also awareness to safety programs is advantageous to the success of every business operations, since the usage of safety intervention significantly lessens direct healthcare cost.

In 2001, Weil foretold that economic indicators utilizing the indicators of health. He discovered that change in health result in higher survival level among employees which translated to about 1.68% increase in the overall level of productivity. Weil further explained his finding to imply that a nation which has a high survival rate with high health indicators among its working population is likely to make the work force

contribute about 70% additional benefits than undesirable employees who live in the country of high morbidity.

Also, in 2005, Blossom & Canning enhanced the strategy utilized in 2001 by Weil with the mean to look at the statistical significance of Weil's findings. It was discovered that the outcomes were like Weil's; in any case, their evaluation (2.8%) was higher than the 1.68 percent for Weil's situation. Therefore, their findings demonstrated a positive significance impact on the survival level on performance per labor.

An organization's culture also enhances the productivity of its workforce. Lambert in 2005 noted that the inadequate management of work environment creates a hindering factor to the improving labour productivity. In 2010, Akinyele indicated that both external and internal factors influence productivity. This came out with the fact that 42.6 percent acknowledge to the fact that poor safety condition impedes their ability to deliver.

2.6 Models of Occupational Health and Safety

The most outstanding model use in the occupational health and safety is the Balance Model. According to Smith and Cohen, 1989 this model iterate on various components such as employees, task. Technology work environment and the organization. These components interact with each other to either produce reduced risk or improve employee safety and health. However, each components produce its own risk. For instance the work environment produces hazards and the employee engage in unsafe act. However this risk can be controlled by managing each

components to make improvement. Also there are occurrences of risk during the interaction components. Organizational components occurs when the organization fail to notify its employees about risk of using new material and the employee also fail to notify the organization about the hazards in using them. In order to obtain a balance situation there is need to deal with the hazards within each components and from the interaction among components.

2.7 Current Occupational Health and safety in Ghana

In Ghana it is clear and demonstrated that health and safety have not improve regardless of the incredible steps adopted by non-governmental and governmental organization to deal with the difficulties over the past few decades. Life expectancy is a common indicator to people health. According to the WHO in 2011, the average life expectancy of the average Ghanaian as at 2010 was sixty years (60) though an assessment was done in 2003 to be 58 years.

In Ghana some of the recognized bodies which indirectly impact on Occupational Health and Safety. These are; Environmental Protection Agency Act 490 1994, the Ghana Health Service and Teaching Hospital Act 526, 1999 and the National Road Safety Commission Act 567 1999.he Department of Factory Inspectorate and Inspectorate of Mineral Commission. Their impact come to play when accidents or incident occur and they are reported to these legal bodies who comes out with a corrective actions which they implement to prevent reoccurrence of the same incidents or accidents.

Ghana has fragmented policies utilized by different ministries, departments, agencies and other organization for policy enforcement and complementary role. Currently the law as existed are factories Act, Office Act 1970 and mining and mineral regulation. In 2011 a draft of national occupational policies was introduced and was implement in 2012 to remedy industrial accidents and incidents by the Ministry of employment and social warfare. This policy was to replace the outmoded one.

2.8 Occupational Health and Safety Management in the Mining Sector

In view of blatant obstacles to effective management of Occupational Health and Safety (OHS), there has been an initiation of a progressive process of legal reform which is aimed at bringing a national Occupational Health and Safety (OHS) laws in line with current thoughts and developments in occupational health and safety. Ghana's compliance with ratified ILO convention add to strengthen and make more effective enforcement powers of the mining inspectorate (Bruce, 2006).

Yankah (2012) posits that providing for fire prevention and firefighting during construction, establishing safety training and orientation for site operatives, top management commitment to worker safety, keeping workplace tidy and informing mine inspectorates of the location of new construction sites as significant measures which is important to improve occupational health and safety measures on sites. Yankah (2012) further contend that setting safety guidelines into the body of conditions of contract for a project, accident investigation and record keeping on sites, and assignment of safety responsibility to all levels of management and workers' among others are ways to manage occupational health and safety in the Extractive Sector.

Bruce (2006) on his part noted the Safe Place Strategy(SPS) is one major strategy adopted in strategically managing occupational health and safety in Ghana, which is based on the assumption that the materials of work (equipment, machinery, substances, safe working environment etc.) compromising to health and safety, especially having regards to acceptable occupational health and safety standards. However, there are limits to this strategy owing to the dynamic nature of the state of the elements of work such as machinery, equipment, substances etc. and the human interaction with these elements (Bruce, 2006).

In outlining the content of Health and Safety Management System, Turkson (2006) suggested that Occupational Health and Safety Management System entails an overview of processes aimed at decreasing the frequency of injury and illness on the job. Thus, successful implementation of the system requires management commitment to the system, effective allocation of resources, and a high level of employee participation..

Handbook of better work environment (2008) says that Occupational health services may support the organization in technical aspects like safety management, ergonomics, work-injury investigations and providing information for new conditions on work environment. Higashi et al. (2006) in their study on occupation health services posits that creating service system for all workers and continuous review is one of the substantial matters in occupational safety and health. In addition, Husman et al. (2006) suggest that occupational health services personnel should learn networking and counselling skills because these services need to have better support service system.

2.9 Artisanal Mining and Definitional issues:

According to Hinton artisanal mining refers to the activities that is used with low innovation or with minimal equipment's (Veiga and Hinton, 2002). Shoko and Love (2005) cited by Adomaah-Basseah (2011) also clarified artisanal mining as a term used to depict mining activities that uses basic techniques (e.g., pick, chisel,, sluices and pans) to the process gold on a small scale (Shoko and Love, 2005).

Shoko and Love (2005) portrayed artisanal mining as subsistence, those occupied with it work freely using their own tools. He contended to the fact that the sector is portrayed as being individualistic and not corporate, in any case the sector incorporates undertakings or people that utilize labourers for mining yet by and large working with hand devices other than machines. He then said that the sector is also portrayed by a work constrain that is not formally prepared in mining, prospecting, separation and handling of minerals (Ibid).

According to Hentschel et al. (2002) there has not been an acknowledged definition for artisanal mining. In perspective of this, artisanal mining is regularly characterise by some key elements. Hentschel et al. (2002) then illustrated a few attributes of artisanal mining which include: lack or level of mechanization, demanding of physical work; minimal level of occupational safety and healthcare and; insufficient skills of the knowledge on all levels of the operation, inefficiency in the exploitation and processing of mineral production. The others incorporate misuse of minor and/or little stores, which are not financially exploitable by mechanize mining, low level of efficiency, low level of pay rates and salary, periodical operation by nearby laborers or as per the business sector value advancement, absence of government managed

savings; deficient thought of ecological issues, absence of working and speculation capital and for the most part working without lawful mining titles (Hentschel et al., 2002).

2.10 Historical background of Artisanal Mining

According to Hilson (2001), history of artisanal mining in Ghana dates far back around 2000 years prior and that hints of alluvial gold mining and mining activities have been found that date as far back to the sixth century (Hilson, 2001). In his book "Harvesting mineral riches": 1000 years of gold mining in Ghana, Hilson (2002b) said traces of minerals been found that there is an abundance of confirmation of minerals. This valuable minerals were attracting Arab traders to certain areas of the country as early as the 7th and 8th centuries AD.

It was due to the richness of the gold deposits at the coasts of Western Sahara that were greatly in charge for the wealth and strength of large ancient Ghanaian empires and cultures. So therefore, it was befitting for Ghana to be tagged as the "Gold Coast" in the 15th and 16th centuries by the Europeans.

2.11 Artisanal Mining in Ghana

From development perspective, artisanal mining is a standout amongst the most complex economic sector of Ghana, however the degree of this sort of mining is exceptionally difficult to quantify. The understanding of the country Occupational Health and Safety management in this mining sector is missing (Lynas, 2014). The number of people who engage in this field are nomadic or illiterate and there is no reliable statistics to quantify whether they are artisanal or small-scale miners. In this

sector they lack meaningful systems, process or model for which they can base on to develop occupational health and safety programs. However, lack of formality in this sector really affect the employee safety and the ability of the inspectorate division to provide assistance to those engage in this activities (Lynass 2014)

Artisanal mining has existed in Ghana both as illegal (Galamsey) and legal mining operations and is concentrated within the greenstone belts (Birimian and Tarkwaian) and alluvial regions particularly along the Offin, Pra, Ankobra and Tano waterways and their tributaries. Lynas 2014 indicated that artisanal mining has gain a global significance because of its potential of providing sustainable livelihood in the communities. However, this activities brings series of occupational health and safety issues not to the people who are involve in the operations but the community that they operates is also being affected. It has been evaluated that large scale mining utilizes around 28,000 employees in Ghana while about 1 million people are in the artisanal mining.

According to the Ministry of Lands, Forestry and Mines (2012), two main types of artisanal mining exist in Ghana, these are: Surface mining which involve alluvial mining using chinses processing equipment known as "Chang Fa" and the "Underground Mining" which involves the usage of explosives and popularly known as "Ghettos". Research have indicated that the fatality rate of artisanal mining is 90 times that of the large -scale mining. Since there are no recording structure for the number of artisanal miners it is really difficult to substantiate those who are operating legally from those who are operating illegally.

Figure 2.1 Chinese processing plant call Chanfa

Figure 2.2 Operation of the Artisanal Mining

2.12 Policy Enactment on Artisanal, Small-Scale and medium Mining sectors

The Minerals Commission have enacted policies to reclassify the module for small-scale mining operations in the country into artisanal mining, small-scale mining and

medium-scale mining. This re-categorization was done to ensure that the artisanal mining and small-scale mining sectors will continue to preserve for Ghanaian nationals only, while the medium-scale mining category will be open to foreign participation. The reasons are to ensure that the revised model will improved performance such as production, sustainable mining practices of the small-scale mining sub-sector, enhanced economic empowerment, and reduction in illegal mining. It will be aimed at improving management of the sub-sector and reducing illegal mining.

Currently the new policy have been enacted with respect to Artisanal Mining, Small-Scale Mining and large scale mining. The policy stipulated that Artisanal mining should be won by Ghanaians which will cover an area of 12.5 sections of land. The Span of the permit is for 5 years which will be renewable after expiration. This mining sector will use manual strategies to mine alluvial and weathered hard rock material. Monthly tolls will be collected from them and there will be no corporate expense or import obligation. No explosive will be use for its operations. Also simple tools are required to be used for this operations

With regards to Small scale- mining, the concession will be owned by a Ghanaian with 25.2 sections of land. The licenses will be for 5 years which will be renewable after expiration. In this sector both alluvial and hard shake material can be mined. Explosives are permitted to be used under strict supervision by the authorities from Inspectorate Division of Mineral commission. Here equipment are required to be used. Main staff of the mine ought to incorporate not less than one mining engineer, one geologist and one bookkeeper. for the area.

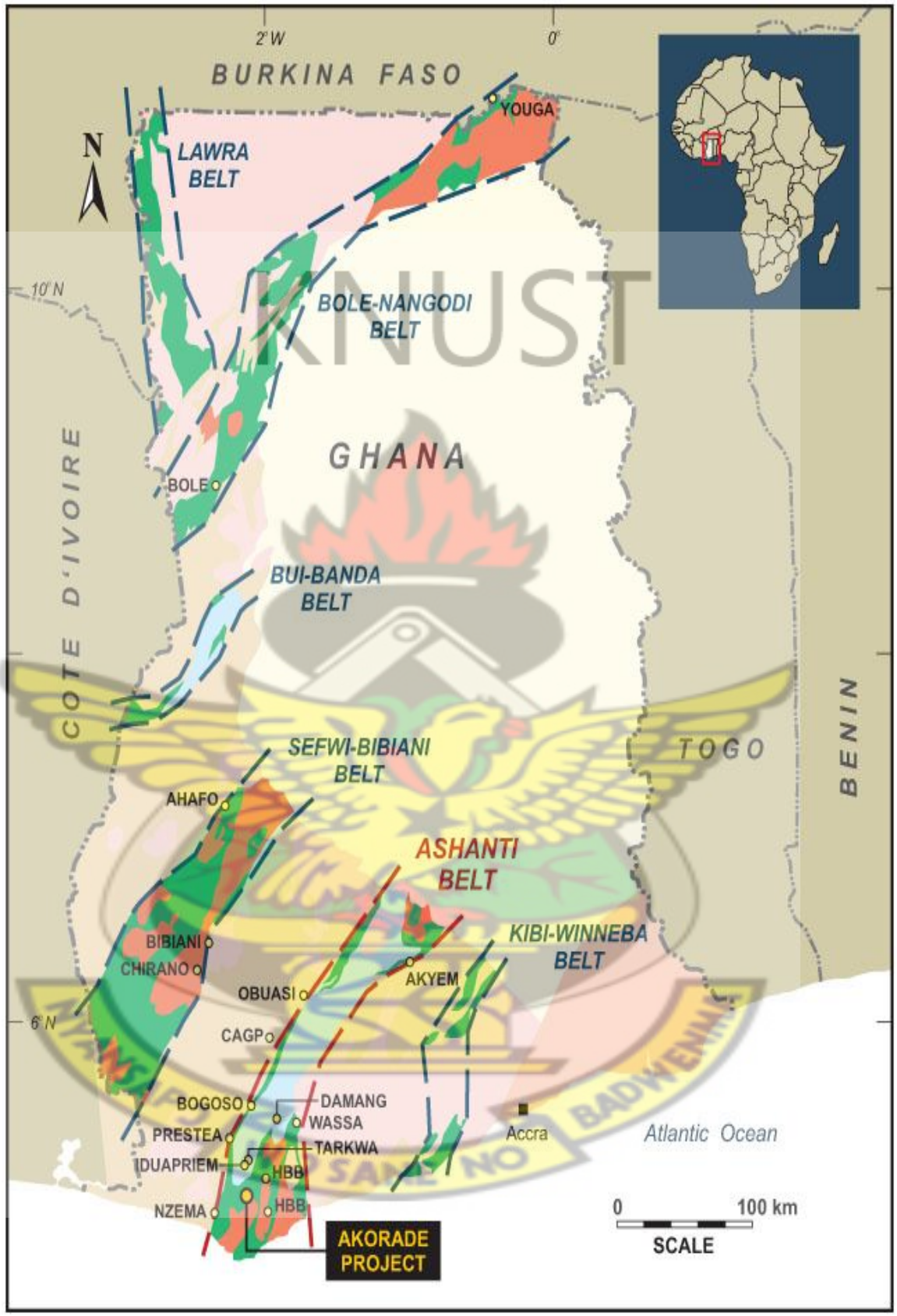

Figure 2.3 Map of Ghana Showing the Gold Belts and the Geological Locations of the Research Areas

2.13 Methods of Artisanal Mining

According to Aryee et al., 2002, artisanal diggers in Ghana utilize different strategies in their operations as per the type of deposit and the location. He ague that majority in this sectors uses sorely traditional may of mining which includes the usage of simple tools such as pick- axe, chisel, pans and hammers. This methods of mining has been categorised in to three forms. These are Shallow alluvial mining, deep alluvial mining and hard rock mining. The Table 2.1 below shows the Locations of the research area and the type of mining

Table 2.1 Research Location of the Type of Artisanal Mining Operation

Research Location	Type of Mining
Obuasi	Deep hard rock type of mining(Getto) Shallow alluvial mining
Tarkwa	Deep hard rock type of mining
Wassa Amenfi	Shallow and Deep alluvial mining
Dunkwa	Shallow alluvial mining
Aboso	Sallow alluvial mining and Deep hard rock type of mining
Bogoso	Shallow alluvial and deep hard rock type

(Sorce: Authors Own. Construction, 2016)

2.14 Global Issues in Artisanal Mining

A research by International Labour Organization (2012) indicate that artisanal mining globally is characterized by large numbers of people around the globe depending on the sector for their livelihood and income. Women constitute in this sector are about a half of the work force for artisanal mining. Also large number of children are engaged in artisanal and small scale mining activities; for instance, (e.g. In Ghana, provision of the work by children is 30% Ghana). Research have proven that greater number of people in this sector are operating illegally.

Goldstein et al. (2001) indicated the importance of Occupational Health and Safety (OHS) is clear to many countries which also have standard working conditions but unfortunately most parts of World are below the minimum standards which were set by International Labour Organization (ILO) and the World Health Organization (WHO).

In many other jurisdictions, issues on Artisanal mining has been thought of as a compromised of the health of worker (Bocangel, 2001; Bhagyalakshmi, 2007; and Hayes, 2008). Many concerns have been raised by health professionals and government agencies around the globe about occupational health and safety management issue. In this section issues of artisanal mining was review under; occupational hazards in mines; Mine Accidents and Injuries; environmental Pollution; social- political Issues and Orientations of policy with regards to gender perspective as the main global issues.

2.14.1 Occupational Hazards in Mines

According to Hentschel et. al, (2002), a standout amongst the most prominent issues in mining is non- compliance to standards with regards to Occupational Health and Safety. Hentschel et. al, (2002) further recommended that numerous artisanal mining operations are said lacking safety regulations, mine safety standards requirement, risk awareness programs in mining and better access to operational equipment requirement. These risk elements lead to health dangers and poorer working conditions in Artisanal Mining sector but little of those conditions exist in the large-scale mining sector.

Colina (2006) indicated that miners who are exposed to airborne particles are those that contract lung airborne particles exhibit systemic and respiratory afflictions. Also, miners experience musculoskeletal conditions, for instance, back torment after lifting material for the operation. This sort of work can results in back pains and injuries (Colina, 2006; Chakravorty, 2001). Hayes (2008) in his work coordinated in Uganda indicated that, there are health risk for women who engage in artisanal mining, for instance, physical injury, unnatural birth cycles because of anxiety and wounds, exposure to mercury, cyanide and sexual brutality.

2.14.2 Mine Accidents and Injuries

Mining is regarded by ILO as a most dangerous or unsafe human activities. In the research of the Institute for Occupational Health and Safety and Development (IOHSAD) in the Philippines, reported the leading type of accident in the mine. This include being hit by falling items, suffocation from substance exhaust, and crushing by a machine. The others are exposure to heat causing heat stroke, poor ventilation, noise, flooding, electrocution and dust, vibration, fall of ground and stress.

The vast majority of the pertinent reasons for injuries among artisanal miners are rocks falling on the employees, subsidence, pit caving in, not adhering to safety, not wearing appropriate personal protective equipment for the job, smoke inhalation resulting from blast and diesel operated machines.

2.14.3 Environmental Pollution

Veiga et. al. (2006) found the adverse impact of mining to the environment. This effects include contamination of water bodies because of improper waste disposal,

erosion, and usage of mercury and cyanide. Mercury contamination in the water system destroy the aquatic ecosystem and eventually affect humans (Veiga et. al., 2006).

In most of the communities, operation of artisanal mining results in erosion and deforestation at the beginning and the end of the mining. Also, most mine dumps mine tailing and effluent into nearby rivers and lakes and this is a major pollutants to the ecosystem (Veiga et. al., 2006). Mercury and cyanide are the two critical chemicals utilized as a part of mining. The drawback of this is mercury is toxic to people and other living creatures and the impact is bothered through bioaccumulation. Cyanide is likewise noxious to both residential and wild creature (Shoko, 2002). In Ghana a study and review that was conducted by Babut et. al. (2003) indicated that there is high centralizations of mercury in rivers and fishes after collecting samples. In Tanzania water tests gathered from a lake close mines were discovered contamination with mercury high concentration (Shoko, 2002; Zubiri, 2010).

2.14.4 Social and Political Issues Associated with Artisanal Mining

In sub-Saharan Africa, artisanal and small scale mining areas are typically characterises by conflict minerals, deadly diseases, smuggling , criminal movement and civil war given that it can be a challenged commodity (Quiroga, 2002). The locality in which the artisanal mining is practiced is burden with issues such as child labour, gender inequality, spread of HIV/AIDS, poor health, environmental devastation, poor health and safety, lack of capital and conflict among those who engage in the artisanal mining operations.

Environmental mismanagement can occur between the local government and the artisanal mining. Crowson (1998) contended that there is great expectation of standard and responsibility by society and there is more public debate in the area of the artisanal mining and the environment. This prompted the plan of Corporate Social Responsibility (CSR) approaches and techniques (Jenkins, 2004) in which the organization must have its own procedures for social duty to help the community in which they operate.

2.15 Occupational Health and Safety of Artisanal Mining in Ghana

According to the Chief Executive Officer of the Ghana Chamber of Mines, in an official statement, about 300 people were accounted have die in 2012 from illegal artisanal mining and small- scale gold mining operations(Ghana Chamber of Mines, 2013). To date, the most prominent Occupational Health and Safety issues has been on the usage of mercury to process gold. The Mercury Abatement Act and Clean Gold are projects that are being worked out to eliminate the usage of mercury by the artisanal mining in gold extraction in the artisanal and the small scale mining sector. Example of groups are the NGOs, solidaridad and the Red Cross working inside groups. However, Occupational Health and Safety intervention has receive low consideration from players in the mining sector.

In an effort to improve the uptake artisanal mining , the Ghanaian National Association of Small- Scale Miners (GNASSM) has marked a Memorandum of Understanding (MoU) with the University of Technology and Mining (UMaT) to train artisanal miners with respect to good mining practices and employment of good occupational health and safety system. (GNASSM, 2014).

Artisanal Mining Africa Network (AMAN) is an as of late enlisted NGO in Ghana with the objective of "moving small- scale mining from the uncoordinated larger scale of employment of unskilled labour and fragmented mining to a well -organised and efficient mining industry.

According to Artisanal Mining Africa Network (AMAN) report dated 2015, Accidents and loss of lives, particularly in illegal mining sectors and hazardous treatment of chemicals particularly mercury and cyanide are two primary issues that must be effectively be managed.

2.16 Research Gap

In spite of the fact that studies on Occupational Health and Safety (OHS) have been carried out by various scholars, these studies do not provide spot-on evidence of the Occupational Health and Safety practices of Artisanal Mining Sector. Further examination of these studies reveals that there is inadequate empirical of the impact of Occupational Health and Safety management models on the Artisanal Mining or Small Scale Mining Sectors in Ghana. Also, the work (Act 651, 2003) neglects to determine the appointment of occupational health and safety officers in an organization and consequently most firms don't have safety managers who screen and assess risk.. Therefore, the present study is an attempt to fill this gap by investigating the effects of Occupational Health and Safety on the Artisanal Mining Sector in the Ashanti, Central and Western Regions of Ghana.

2.17 Conceptual Framework

In light of the review of literature and the objectives of the study, the conceptual framework for the study is developed and the hypotheses underlying the proposed relationship between Occupational Health and Safety, and Artisanal Mining are discussed for empirical testing. Some of the theories that underpin occupational health and safety in every organization are discussed below.

2.17.1 Economic Theory

A business will figure out if to prevent working environment injury or diseases by comparing the cost of counteractive action and the cost of not making such move. For risk that are not prevented, the organization will be in charge of paying laborers' compensation to injured or sick employee.

An organization will put resources into safety and health management until the cost is more than the cost of paying higher wages, compensation, and other injury and sickness costs. On the other hand if employers are fully compensated (ex post and ex stake) for the accidents and diseases which are not preventable then, the organization will be more efficient in terms of market with respect to employment

2.17.2 Theories of Incidents

The hypothesis behind workplace harm, disease, or fatality is that they are symptomatic of a bigger issue inside the work environment framework. There is a domino effect in regards to responsibility. In the event that a employee commits an error and causes an accidents, we can perceive that there is supervisory failure intems

of training, job plan, someone to mentor prepare, mentor, watch, work arrangement, et cetera.

In other words if the accident is caused by the supervisor then we can conclude that the manager is liable because he did not select the supervisor properly.

2.17.3 Danger Factor Theory

This theory specify that accident occurs when a worker and danger factor meet and that the worker injured himself. The danger factor is the one with high energy content. Assuming there is missing link in the line of flow about the usage of new material procured accident will happen. Accident can be avoided when there is adequate information flow

2.17.4 Sociological Theory

This theory stipulated that accident causing injury happens when an employer have social relation with its working environment. Prevention of occupational injury occurs when auto control of workers and management is increase.

2.17.5 Risk theory

This theory take recognition to the fact that people acknowledge constant level of risk they are ready to accept as their goal. If the risk is reduce due to the safety measure, people tend to adjust their goal to that risk level. This means that accidents are preventable.

Conceptual Framework

Artisanal mining is a standout amongst the most complex economic sector of Ghana. Thus artisanal mining activities have been described as being risky. The conceptual framework seeks to establish the relationship between artisanal mining activities and the uptake of occupational health and safety practices. The flow of the concept is that artisanal activities are associated with certain occupational health and safety issues. This therefore calls for the uptake of occupational health and safety practices. However the researcher perceives a mediation role of management commitment, socio-cultural issues, demographic characteristics and safety training. Thus the uptake of occupational health and safety practices depends on these factors. Therefore the following hypotheses are developed:

a) Hypothesis one: There is a relationship between artisanal mining and occupational health and safety issues.
b) Hypothesis two: There is a relationship between occupational health and safety issues and uptake of occupational health and safety practices.
c) Hypothesis three: There is a relationship between occupational health and safety issues and uptake of occupational health and safety practices mediated by management commitment.
d) Hypothesis four: There is a relationship between occupational health and safety issues and uptake of occupational health and safety practices mediated by demographic characteristics.
e) Hypothesis five: There is a relationship between occupational health and safety issues and uptake of occupational health and safety practices mediated by socio-cultural issues.

f) Hypothesis six: There is a relationship between occupational health and safety issues and uptake of occupational health and safety practices mediated by safety training

Figure 2.4 Conceptual Framework

Source: (Researchers own concept, 2016)

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter deals with the techniques that would be employed to conduct this study. This incorporate data collection instruments such as questionnaires. Further, this session spells out the approach to the research such as sampling methods, data collection and data analysis procedures. In addition, confidentiality issues as well as validity and reliability of the research process and procedure are discussed in this chapter.

3.1 Research Design

This study adopted the descriptive research design. This as postulated by the assertion of Sullivan (2001) that descriptive research is attempt to discover facts or describe reality. Descriptive design according to an opinion shared by Sullivan (2001), and further expounded by Saunders et. al (2007) refer to an extension of exploration research assuming that the researcher of a descriptive study has a control of the phenomenon under investigation. As explained by Malhotra and Birks (2006) prior formulation of specific research question and hypotheses which would be the case of this research is a characteristic of descriptive design. Thus, the research was pre-planned and structured. As a nature of descriptive research design (Neuman, 2006), the outcome of this research which is with a well-defined subject would be a detailed picture of the subject.

By way of procedure for this research, the research would search for relevant literature at libraries, on the internet, from journals, magazines, publications, research

thesis and relevant textbooks on Occupational Health and Safety Management. Questionnaires were analysed using statistical techniques.

3.2 Population of the Study

The target population of this study is all registered Artisanal Mining firms within Ashanti, Central and Western Regions of Ghana. The constituents of the population included owners, supervisors and miners.

3.3 Sampling and Sampling Technique

A sample of 130 respondents was selected from three mining regions for the purpose of this study. The data was taken from the Artisanal mining firms within Obuasi, Tarkwa Nsuaem District, Prestea, Dunkwa, Bogoso and Wassa Amenfi East but the names of the companies will remain anonymous in the research work. In order to ensure ethical research, the respondents would be assured of the anonymity of their identity (Cooper and Schindler, 2006). The choices of firms were based on convenience sampling technique since most of the firms are widely spread.

3.4 Research Instruments

3.4.1 Questionnaire

Largely the questionnaires were made up of the occupational health and safety issues associated with artisanal mining as well as the uptake of occupational health and safety practices. The questionnaires were measured using a likert scale from one to five. Thus the scale included strongly agree=1; Agree=2; neither agree nor disagree=3; disagree=4; strongly disagree=5 as well as 1=Very Often, 2=Often

3=Indifferent, 4=Not Often, 5=Not at all. The researcher made use of self-administered questionnaires.

There were two forms of questions; open ended questions and close ended questions. The close ended questions comprised a set of alternative answers from which the respondents were asked to choose the one that most closely represents their view. There was no option in the open ended question. The respondent's answers were recorded in full when the interviewee was alerted that recording was being done. However, enough time was given to the respondents to think through the question and answer the way he understood the questions. Pretesting check was conducted by the researcher in an informal manner before following up with the full scale questionnaire administration. To ascertain the completeness of data and ensure quality, questionnaires and interview guide were numbered serially.

3.5 Data Collection and Analysis

According to Sullivan (2001), data collection constitutes the basic observation from which conclusions are made. Thus, data collection is an approximation of knowledge (Neuman, 2006). Deriving meaning from the data that would be collected by the use of questionnaires and interviews will be the main object of analysing the collected data. The data would be looked at with two main lenses- quantitative and qualitative. The quantitative data analysis would involve the use of statistical tools (SPSS, Version 20.0) to assemble, classify, analyse and summarize the data to derive meaning from the raw data. While qualitative would involve summary description of data collected from the field, journals, dissertations, articles among others and whereas qualitative made use of descriptions and analysis of feedback from interview.

However, the data would be analysed according to how each respondents reflected the related question presented.

3.6 Validity and Reliability

According to Saunders et. al (2007) validity and reliability constitute the credibility of a study. Thus the finding of a study takes credence from its validity and reliability. Given that the reported data would represent the response of respondents and the extent to which the researcher serve to distract respondents, the study would employ the ecological validity. Thus, the researcher was pre-test the questionnaire at New-Edubiase, Adansi-South District. Where staff of Artisanal Mining firms, would be selected on the basis that they are part of management. The researcher validated the findings through existing relationships with these Artisanal Mining Companies and other available research.

3.7 Ethical/Confidentiality Consideration

According to Sullivan (2001), social researchers are bound to ethical considerations in their studies. Among others, adherence to the sanctity and worth of each respondent is value that would be upheld in respect of the respondents' right to privacy. Also, scientific misconduct such as false information and plagiarism on the part of the researcher. Furthermore, the researcher disclosed all aspects of the research to respondents that might influence their decision to participate in a survey.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.0 Introduction

This chapter presents and discusses the results from the analysis of the data collected from respondents. This chapter presents the findings based on the objectives which were set for the study. It describes the demographic characteristics of the respondents, Operational Activities of Artisanal Miners in Ghana, Common Occupational Health Hazards issues associated with Artisanal mining in Ghana, Artisanal Miners Uptake of Occupational Health and Safety practices, regression results of management commitment and (OHS) Practices, regression results of (OHS) Practices and Age, Tenure, Education, Source of Capital and regression results of (OHS) Practices and Safety Training, Socio-Cultural Issues.

The data was presented in the form of tables. The survey was conducted on a total of 160 respondents out of which 130 responses were received, representing 81.25 % response rate.

4.1 Demographic Characteristics of Respondent

From table 4.1, it is evident that most of the respondents are males (108) representing 83.1% of the respondents whiles females constitutes minority of the respondents (22) also representing 16.9% of the respondents. This wide gender difference among the participants may be explained by the physical nature of mining activities which are not suitable to females. This finding however contradicts with the International Labour Organization (2012), who found that artisanal and small scale mining worldwide is characterized by women forming about a half of the labour force for small scale mining.

It is also observed that, most of the respondents (48.5%) were in the 26 to 35 age group whiles the minority of the respondents (1.5%) was in the above 56 age group. However workers with age of 36-45 years were also made up of 17.7% of the respondents whiles workers with 25 and below were also made up of 26.9% of the respondents. The possible reason for majority of the respondents to fall between the ages 25 and below and 26 to 35 years may be due to the nature of the mine work. This however disagrees with the findings that 30% of the work artisanal mining is provided by children in Ghana (International Labour Organization 2012).

The study reveal that majority of the respondents were people with formal education up to the Junior high level which translates to about 37.7% of the total number of respondents. This group was followed by those respondents with up to Secondary education representing about 26.9% while those Basic and Elementary education also followed with 13.8% and 3.8% respectively. Also, 6.9%, 2.3% and 1.5% of the remaining number of respondents had their formal education up to the Tertiary, Technical and GCE O' Level respectively while 6.9% of them did not have any form of formal education. This means that most of the respondents are people who have had some form of formal education and hence are people who can be trusted with their comprehension and as well filling of the questionnaires. Also with 37.7% junior high school indicate that a lot of them are school dropout. This however contradicts with (Lynas, 2014) who discovered that the population engaged in artisanal mining is largely nomadic and illiterate, and no reliable statistics exist for either small-scale or artisanal mining.

Regarding the number of years respondents have been in the Artisan business, the results obtained reveal that those with less than five years were the majority which represent about 42.3% of the total number of respondents who took part in the survey. Similarly, 36.2% also indicated that they have between six to ten years' experience in the Artisan business. Also, 20% and 1.5% of the remaining participants said they have between eleven to fifteen and sixteen to twenty years of work experience respectively. This suggest that the respondents who were considered for the study have enough work experience in the area and so are expected to have good understanding of the questionnaire in order to provide appropriate answers.

Furthermore, the survey also sought to find out whether respondents have the requisite license for their mining activities and the outcome of the survey showed that a vast majority of them did not have valid license which represent about 88.5% of them. Only 11.5% of the remaining 130 participants actually had valid license for their mining activities. This finding suggest that just like all other players in the informal sector do not think it is necessary to obtain any certificate or valid license before commencement of business activities.

When it comes to the sources of capital for their mining activities, most of the participants (53.8%) indicated that their business capital came from individual efforts while about 34.6% of them also shared that they obtained their mining capital through loans. 3.1%, 5.4% and 3.1% of the remaining participants however indicated that their capital came from sources such as family contributions, gold dealers and foreign investors respectively. The outcome thus reveal similar sources of funding of business just like all other artisans in the informal sector.

Finally, the personal profile of the respondents with respect to how they were introduced into the mining business was considered. The results obtained from the survey shows that most of the participants said they introduced into the business by their friends which represent about 61.5% of the total number. This percentage was followed by those who indicated that their brothers introduced them (15.4%) while 5.4% said their uncles. Furthermore, 5.4%, 1.5%, 2.3%, 7.7% and 8% of the rest of the participants indicated that their fathers, mothers, themselves, family and husband introduced them into the mining business. This means that the influence by friends on their colleagues to venture into the artisan mining business is very great which may be explained by the success stories they hear from their friends in the business.

Table 4.1: Demographic Characteristics of Respondents

VARIABLE	Frequency	Percentage
Gender		
Male	108	83.1
Female	22	16.9
Total	**130**	**100%**
Age		
25 and below	35	26.9
26 – 35	63	48.5
36 – 45	23	17.7
46 – 55	7	5.4
Above 56	2	1.5
Total	**130**	**100%**
Level of education		
Elementary	23	17.6
Junior High	49	37.7
Secondary/SeniorHigh/Technical/GCE O'level	40	30.7
Tertiary	9	6.9
Uneducated	9	6.9
Total	**130**	**100%**
Tenure(Years of being in the Artisan Mining Sector)		
Under 5 years	55	42.3
6 – 10 years	47	36.2
11 – 15 years	26	20.0
16 – 20 years	2	1.5
Total	**130**	**100%**
Valid Mining License		
Yes	15	11.5
No	115	88.5
Total	**130**	**100%**
Sources of Capital for mining		
Individual Contributions	70	53.8
Family contributions	4	3.1
Loan	45	34.6
Foreign Investment	4	3.1
Gold dealers	7	5.4
Total	**130**	**100%**
Introduction into mining		
Friends	80	61.5
Brothers	20	15.4
Uncles	7	5.4
Father	7	5.4
Mother	2	1.5
Myself	3	2.3
Family	10	7.7
Husband	1	8
Total	**130**	**100%**

Source: Field Survey, 2016

4.2 Operational Activities of Artisanal Miners in Ghana

Table 4.2 below presents the descriptive findings of the mining operational activities in artisanal mining. As can be seen from the table, just a very few of the artisanal miners in Ghana have valid mining license which corresponds to about 13% as against a vast majority translating to 90% of the total number of participants. This finding is consistent with the work of Hentschel et al. (2002) who outlined some characteristics of artisanal mining which include lack of working and investment capital and mostly working without legal mining titles among others.

Relating to how these artisanal miners acquire their land for the mining activities, the outcome reveal that about 40.77%, 43.85% and 15.38% indicated that they acquire land for mining purposes from family, chiefs and mining companies respectively. It is thus apparent that land meant for artisanal mining activities in Ghana is made available by chiefs.

On whether artisanal miners have supervisors at their mining sites, the results reveal that most of them said they have supervisors representing about 85.38% while those who are not managed by supervisors represent the remaining.

Participants were also asked to determine if they have safety officers and the outcome suggest that about 87.69% indicated yes while only 12.31% did not have.

Regarding the usage of explosives in the mining activities, majority of the respondents representing about 87.69% answered yes to usage while only 12.31% of the remaining total number said they do not use explosives. This finding is thus in line

with the discovery that explosives are used in cases where the ore is hard (Aryee et al. 2002).

Participants were also asked to describe the kind of mining they undertake and the outcome show that majority of them engage in underground mining translating to about 71.54% whereas those who engage in surface mining occupied the rest of the total participants. It could then be concluded that in the small scale mining sub-sector in Ghana, drilling is the biggest method of mining used which is agreement with Aryee et al. (2002) who identified and grouped these methods into three types which are shallow, deep and hard rock alluvial mining in which methods such drilling, magnets, excavating and digging are used.

It is therefore evident that most of the artisanal mining activities are done underground. This finding thus confirms the types of artisanal mining identified by the Ministry of Lands, Forestry and Mines (2012) to include two main types of Artisanal Mining activities in Ghana: these are 'Surface Mining' which involves alluvial mining using Chinese-made processing equipment known as "Chang Fa" and 'Underground Mining' which involves drilling and blasting hard rock mining employing largely rudimentary methods of mining popularly called "ghettos".

Finally, the survey also sought to determine the main minerals produced by artisanal miners in Ghana and the results obtained indicated that only gold was produced suggesting the major minerals that artisanal mining in Ghana seek for is gold.

Table 4.2: Operational Activities of Artisanal Miners in Ghana

VARIABLES	FREQUENCY	PERCENTAGE (%)
Do you have a valid mining license?		
a) Yes	13	10.00
b) No	117	90.00
How do you acquire land for your mining activities?		
a) Family	53	40.77
b) From chief	57	43.85
c) From mining companies	20	15.38
Do you have supervisors?		
a) Yes	111	85.38
b) No	19	14.62
Do you have safety officers?		
a) Yes	114	87.69
b) No	16	12.31
Do you have explosives?		
a) Yes	114	87.69
b) No	16	12.31
Description of mining method		
a) Surface(Alluvial mining)	37	28.46
b) Underground(drilling and blasting)	93	71.54
The main minerals produced?		
Gold	130	100.00

Source: Field Survey, 2016)

4.3 Common Occupational Health Hazards issues associated with Artisanal mining in Ghana

The common occupational health and safety issues associated with artisanal mining in Ghana were grouped into physical hazards, psychosocial hazards and ergonomic hazards. Presented in table 4.3 to 4.5 are the descriptive findings from the responses collected from respondents. Here the mean will be used in the explanation of the variables, thus the study employed the rank of 1=Very Often, 2=Often, 3=Indifferent, 4=Not Often, 5=Not at all.

4.3.1 Physical Hazards

The result of the Table 4.3 below shows that fire out breaks at the work sites of artisanal mining does not occur often as indicated by the mean response value of 3.51. The mean response for explosions at abandon sites is reported to be 3.4, which suggests that artisanal miners are of the view that explosion at abandoned sites do occur but not often. Also, physical hazards such as employees being run over by dumb trucks, employees falling over heights when descending, employees being electrocuted during operational activities all received means of 3.07 and 3.68. This indicates that physical hazards do occur but not often as shown by the indifference response by artisanal miners in terms of the mean category. High levels of noise during drilling and blasting and employees being exposed to dusty conditions with no nose mask all received mean of 2.02 and 1.91 respectively. This shows that artisanal miners are of the view that high levels of noise during drilling and blasting and employees being exposed to dusty conditions are physical hazards that occurs often in artisanal mining and hence forms part of the common occupational health hazards associated with mining.

Furthermore, the mean responses for due to the inadequate ground control employees experience cave in with people trapped, flooding of operational working experienced during the rainy season and that there is accumulation of smoke emitting from diesel operated equipment at working areas were 2.72, 2.58 and 2.72 respectively. This shows that so far artisanal mining activities are concerned that these hazards do occur but not often.

This is consistent with the findings of Hayes (2008) who in his work conducted in Uganda contend that Physical hazards were among the commonly occurring health hazards in artisanal mining.

However when it comes to overall Common Occupational Health Hazards issues associated with Artisanal mining in Ghana it received a mean value of 2.96, showing that common occupational health and safety hazard issues associated with artisanal mining often occurs.

Table 4.3: Common Occupational Health Hazards issues associated with Artisanal mining in Ghana

Artisanal Mining Physical Hazards	N	Mean	S.D
1) There are fire outbreaks at the work sites	130	3.51	1.556
2) There are explosions at abandon sites.	130	3.40	1.471
3) Employees are being ran over by dump truck, excavators and other mobile equipment.	130	3.99	1.321
4) Employees falls from a height whenever descending or ascending in a pit or walking around unfenced pit.	130	3.07	1.277
5) Employees are electrocuted during operational activities	130	3.68	1.447
6) There is high level of noise during drilling, blasting, milling, and other operational activities, which affect the human ears.	130	2.02	1.184
7) Employees are exposed to dusty conditions at working place and no nose guard or mask is provided.	130	1.91	.960
8) Due to inadequate ground control, we experience cave in and eventually people are trapped.	130	2.72	1.295
9) Flooding of operational working is experienced during the rainy season.	130	2.58	1.219
10) There is accumulation of smoke emitting from diesel operated equipment at the working areas.	130	2.72	1.175
11) Overall Artisanal Mining in Ghana		**2.96**	

Rank: [1=Very Often, 2=Often, 3=Indifferent, 4=Not Often, 5=Not at all]

Source: (Field Survey, 2016)

4.3.2 Psychosocial Hazards

With regards to psychosocial hazards in the artisanal mining activities, the result in Table 4.4 below revealed that employees work for very long hours as this is indicated by the mean response of 1.71.The results also indicate that there are adequate interaction among families of employees after long hours of work happens does not occur often but sometimes do as indicated by the mean response of 3.24 being indifference. In addition, violence among workers also recorded a mean response value of 2.75 suggesting that it often occurs.

The findings is consistent with that of Hayes (2008) who in his work conducted in Uganda contend that Psychosocial hazard were among the commonly occurring health hazards in artisanal mining.

Table 4.4: Psychosocial Hazards

Psychosocial hazards in artisanal mining	N	Mean	Std. Deviation
Employee work for a long hours.	130	1.71	1.074
There's adequate interaction among families of employee after long hours of work,	130	3.24	1.262
There is always violence among the workers.	130	2.75	1.557
Overall Mean		**2.57**	

Rank: [1=Very Often, 2=Often, 3=Indifferent, 4=Not Often, 5=Not at all]

Source: (Field Survey, 2016)

4.3.3 Ergonomic Hazards

On ergonomic hazards that occur in artisanal mining, the results in table 4.5 below suggest that lifting materials unaided received a mean value of 1.71, indicating that artisanal miners often lift up materials unaided while workers experiencing knee injuries after lifting load also recorded a mean response value of 2.22 suggesting that artisanal miners often experience knee pains after lifting loads. More so, shoulder

disorders and employees complaining of back pains both recorded mean response values of 2.18 and 2.12 respectively revealing that these ergonomic hazards occur often in the artisanal mining activities.

To conclude the three common occupational health and safety hazards discussed above are thus in conformity with the work of Hayes (2008) who in his work conducted in Uganda contend that Ergonomic hazards is among the commonly occurring health hazards in artisanal mining.

Table 4.5: Ergonomic Hazards

Ergonomic Hazards in artisanal mining	N	Mean	Std. Deviation
Materials are lifted unaided.	130	2.13	1.302
Workers experienced knee injuries after lifting load.	130	2.22	1.127
There are issues with shoulder disorder.	130	2.18	1.311
Most employees complain of back pain.	130	2.12	1.001
Overall mean		**2.16**	

Rank: [1=Very Often, 2=Often, 3=Indifferent, 4=Not Often, 5=Not at all]

Source: (Field Survey, 2016)

4.4 Artisanal Miners Uptake of Occupational Health and Safety practices

Here the study will make use of 1= Not at all, 2=Not Always, 3=Neutral, 4=Somehow, 5=They are; to analyse the artisanal miners uptake of occupational health and safety practices in terms of mean.

Management commitment, employee perception about (OHS) and personal safety priority were among the various dimensions employed to aid in the determination of the opinions of participants on the occupational health and safety practices (OHSP) uptake among artisan participants.

With regards to management commitment, the result in table 4.6 below indicate that management encouragement to employees to work in accordance with safety rules even when the work schedule does not always occur as indicated by the mean response value of 2.7. In a similar manner, management placing safety before production recorded a mean response value of 2.62 which is neutral. This indicates that artisanal miners do not know whether management places safety before production. The possible reason might be that this is not in place and sometimes management pretends as if they do place safety issues before production. Also, management ensuring that safety problems discovered during safety rounds are corrected immediately, management allowing each employee to influence safety in their work and management involving employees in decisions regarding safety all recorded mean responses of 2.47, 2.21 and 2.31 respectively. This shows that the management commitment in these areas were not always. It is further revealed that management treating employees involved in accidents, management always blaming employees for accidents, management considering employees' suggestions regarding safety received means of 2.53, 2.74 and 2.62, indicating that artisanal miners are indifferent concerning these practices. The possible reason might be that management sometimes do them but not frequent. Management operating an open door policy on safety issues all recorded mean response value of 2.4 indicating management does not always operates an open door policy on safety issues.

Concerning employees perception about occupational health and safety practices, the results suggest that employees does not always work together to achieve a high level of safety as indicated by the mean response value of 2.74. Furthermore, workers taking joint responsibility to ensure that the workplace is always kept tidy and

workers feel safe when working together received a mean of 2.71 and 2.94, indicating that artisanal miners are of the view that they are indifferent concerning such issues and are don't know whether they do exist. Workers help each other to work safely, obtained a mean response value of 3.28 suggesting that workers are neutral when it comes to taking responsibility for each other, thus the possible reason might be that artisanal miners sometimes takes responsibility for each other and at times does not. employees' perception about occupational health and safety practices was somehow high in artisanal mining activities.

With reference to personal safety among artisanal miners, the result obtained suggest that safety being the number one priority in workers mind when completing a job, safety rules and procedures are carefully followed and that employees are involved in informing management of important safety issues all recorded a mean response value of 2.69, 2.56 and 2.52 which indicate that the workers personal safety priority in artisanal mining are rarely undertaken by the artisanal miners as shown by the mean as neutral.

However, understanding the safety rules for their jobs and being clear about what their responsibilities are regarding health and safety recorded mean response values of 3.26 and 3.02, which simply means that these are personal safety issues that are rarely observed by the artisanal miners as also shown by neutral response.

Table 4.6: Artisanal Miners uptake of occupational Health and safety practices

	N	Mean	Std. Deviation
Management Commitment			
1. Management encourages employees to work in accordance with safety rules, even when the work schedule is tight.	130	2.70	1.396
2. Management places safety before production	130	2.62	1.371
3. Employee have confidence in the management ability to handle safety.	130	2.58	1.305
4. Management ensures that safety problems discovered during safety rounds/evaluations are corrected immediately.	130	2.47	1.325
5. Management allow for each employee to be able to influence safety in their work.	130	2.21	1.237
6. Management involves employee in decisions regarding safety.	130	2.31	1.340
7. Management treats employees involved in accident fairly.	130	2.53	1.371
8. Management always blames employees for accidents,	130	2.74	1.279
9. Management considers employees' suggestions regarding safety.	130	2.62	1.209
10. Management operates an open door policy on safety issues.	130	2.40	1.179
Overall Management Commitment		**2.51**	
EMPLOYEE PERCEPTION ABOUT (OHS)			
1) Workers try hard together to achieve a high level of safety.	130	2.74	1.321
2) Workers take joint responsibility to ensure that the workplace is always kept tidy.	130	2.71	1.372
3) Workers help each other to work safely.	130	3.28	1.240
4) Worker take no responsibility for each other safety.	130	2.94	1.424
5) Worker feel safe when working together.	130	2.87	1.547
Overall Employee perception		**2.90**	
PERSONAL SAFETY PRIORITY			
1) Safety is the number one priority in my mind when completing a job.	130	2.69	1.435
2) Safety rules and procedures are carefully followed.	130	2.56	1.420
3) I am involved in informing management of important safety issues.	130	2.52	1.240
4) I understand the safety rules for my job.	130	3.26	1.172
5) I am clear about what my responsibilities are regarding health and safety.	130	3.02	1.138
Overall Means		**2.81**	

A= Not at all, B=Not Always, C=Neutral, D=Somehow, E=They are
Source: (Field Study, 2016)

4.5 Factors that influences the uptake of Occupational Health and Safety (OHS) practices among artisanal miners

Various factors including management commitment, safety training and socio-cultural issues are usually considered among the factors that influence the uptake of occupational health and safety (OHS) practices among artisanal miners. The opinions of participants as to whether these factors actually influence them to uptake occupational health and safety practices are discussed below.

4.5.1 Management Commitment

From Table 4.7, management encourages employees to work in accordance with safety rules, even when the work schedule is tight, management places safety before production, employee have confidence in the management ability to handle safety and management ensures that safety problems discovered during safety rounds/evaluations are corrected immediately received mean of 2.70, 2.62, 2.58 and 2.47 respectively. This simply means that artisanal miners are of the view that current management commitment in terms of management encouragement of employees to work in accordance with safety rules, management places safety before production, employee have confidence in the management ability to handle safety, management allow for each employee to be able to influence safety in their work are managerial factors which are not in place and therefore does not influence occupational health and safety practices among artisanal miners at all. The possible reason might be that this problem cuts across various artisanal mining operating sights. This finding however agrees with the findings of Yankah (2012) who posits that top management commitment to worker safety, keeping workplace, tidy and informing mine inspectorates of the

location of new construction sites as significant measures which is important to improve occupational health and safety measures on sites.

Management allows for each employee to be able to influence safety in their work received a mean of 2.21. This means that the respondents agree to the fact that the current management commitment in terms of allowing artisanal miners to be able to influence safety in their work does not always influence occupational health and safety practices in their operations.

Management involves employee in decision regarding safety and management operates an open door policy on safety issues received a mean of 2.31 and 2.40 respectively. This simply means that artisanal miners are of the view that the current management commitment in terms of these factors does not always influence the uptake of occupational health and safety practices. This shows management deficiency in these areas.

Management treats employees involved in accident fairly, management always blames employees for accidents and management considers employee's suggestions regarding safety received a mean of 2.53, 2.74 and 2.62 respectively. This simply means that artisanal miners are not so sure of the management commitment in this line and therefore their influence on the uptake of occupational health and safety practices are not certain.

Table 4.7: Management Commitment

	N	Mean	Std. Deviation
Management Commitment			
1. Management encourages employees to work in accordance with safety rules, even when the work schedule is tight.	130	2.70	1.396
2. Management places safety before production	130	2.62	1.371
3. Employee have confidence in the management ability to handle safety.	130	2.58	1.305
4. Management ensures that safety problems discovered during safety rounds/evaluations are corrected immediately.	130	2.47	1.325
5. Management allow for each employee to be able to influence safety in their work.	130	2.21	1.237
6. Management involves employee in decisions regarding safety.	130	2.31	1.340
7. Management treats employees involved in accident fairly.	130	2.53	1.371
8. Management always blames employees for accidents,	130	2.74	1.279
9. Management considers employees' suggestions regarding safety.	130	2.62	1.209
10. Management operates an open door policy on safety issues.	130	2.40	1.179
Overall mean		**2.51**	

A= Not at all, B=Not Always, C=Neutral, D=Somehow, E=They are

Source: (Field Study, 2016)

4.5.2 Safety Training

The results in table 4.8 below indicate that the safety procedures that have been developed do not always influence workers engage in artisanal mining to uptake occupational health and safety practices since it recorded a mean response value of 2.45. The possible reason might be that these operators are not concerned on issues relating to safety, or the full package of safety training is not in place.

The finding agrees the findings of Yankah (2012) who suggest that establishing safety training and orientation for site operatives, was a significant measure which is important to improve occupational health and safety measures on sites.

Safety procedures were also considered not to be satisfactory always because of the mean response value of 2.45. This finding thus is consistent with Hentschel et. al., (2002) who suggested that many small scale mining operations are said to be lacking safety regulations, reinforcement of mine safety requirements, awareness of the risks inherent in mining, and access to better equipment. More so, both follow-ups and refresher safety training provided and safety problems are properly analyzed and solved in a timely manner were considered to be not always influencing the uptake of health and safety practices because they both recorded a mean response value of less than 2.5. However, safety problems being regularly identified and reported as well as there are proper repair of facilities and equipment before and after using them both recorded 2.51 and 2.66 respectively for mean response values which indicate that they are neutral as whether safety problems are regularly identified and reported as well as proper repair of facilities and equipment before and after using them. Conclusively, safety training in artisanal mining does not always take place and hence the resultant result of workers in artisanal mining not uptaking occupational health and safety practices as the overall mean response value is 2.44. The finding is consistent with the work of Yankah (2012) who argues that setting safety guidelines into the body of conditions of contract for a project, accident investigation and record keeping on sites, and assignment of safety responsibility to all levels of management and workers' among others are ways to manage occupational health and safety in the Extractive Sector.

Table 4.8: Safety Training

	N	Mean	Std. Deviation
Safety procedures have been developed.	130	2.45	1.609
Safety procedures are satisfactory.	130	2.45	1.545
Employees are sufficiently trained in safety procedures and in using personal protective equipment at work.	130	2.27	1.493
Follow-ups and refresher safety training provided.	130	2.38	1.427
Safety problems are regularly identified and reported.	130	2.51	1.437
Safety problems are properly analyzed and solved in a timely manner.	130	2.38	1.480
Are there proper repair of facilities and equipment before and after using them?	130	2.66	1.597
OVERALL MEAN	130	2.44	

Rank: [1= Not at all, 2=Not Always, 3=Neutral, 4=Somehow, 5=They are]

Source: (Field Study, 2016)

4.5.3 Socio-Cultural issues

The results in table 4.9 below present participants' views on the influential capacity of socio-cultural factors influencing artisanal miners to uptake occupational health and safety practices.

Table 4.9: Socio-Cultural issues

Socio-cultural issues in artisanal mining	N	Mean	Std. Deviation
I take safety issues serious because my family is so important to me.	130	1.95	.939
I take occupational health and safety serious because my community have appointed me as safety ambassador.	130	2.49	1.036
Overall mean		**2.22**	

A=Strongly Agree, B=Agree, C=Neutral, D=Disagree, E=Strongly Disagree

Source: (Field Survey, 2016)

From table 4.9 it was realized that I take safety issues serious because my family is so important received a mean of 1.95. This simply means that the artisanal miners agree

to the fact that they take safety issues serious because their family is so important to them, hence an influence on the uptake of occupation health and safety practices.

It was also recognized in terms of I take occupational health and safety serious because my community have appointed me as safety ambassador received a mean of 2.49. This simply means that the artisanal miners agree that they take occupational health and safety serious because their communities have appointed them as safety ambassadors. Therefore it influences their uptake of occupational health and safety practices.

4.6 Test of Hypotheses

4.6.1 Relationship between Common Occupational Health and Safety issues and Artisanal mining operational Activities.

This section looks at the relationship between common occupational health and safety issues and artisanal mining operational activities. Therefore the following hypotheses are postulated;

Ho= There is a relationship between occupational health and safety issues and artisanal mining operational activities.

H≠ There is no relationship between occupational health and safety issues and artisanal mining operational activities.

There is a positive correlation between artisanal mining and physical hazard. The positive correlation suggests that artisanal mining and physical hazard move in the same direction. Thus, the higher the artisanal mining activities, the higher the occurrence of physical hazard. It can also be seen from the table that psychosocial

hazard has positive and significant correlation suggesting that they move in the same direction. Thus an increase in artisanal mining increases the psychosocial hazards associated with it.

Also, artisanal mining equally had positive correlation with ergonomic hazard and with common occupational health and safety issues in artisanal mining however it was not statistically significant.

The results also show positive and significant correlation between ergonomic hazard with common occupational health and safety issues in artisanal mining. The positive correlation between them suggests that they move in the same direction. Thus, an increase in artisanal mining increases the ergonomic hazards associated with it.

Finally, the results presented in table 4.3 below shows a positive significant correlation between artisanal mining and common occupational health and safety issues in artisanal mining. This simply means an increase in the artisanal mining activities increases the occupational health and safety issues.

Table 4.4: Correlation Analysis

	Mean	**S.D**	**1**	**2**	**3**	**4**	**5**
Artisanal Mining	1.85	0.33	1				
Physical Hazard	2.96	0.77	0.35**	1			
Psychosocial Hazard	2.56	0.88	0.65	0.337**	1		
Ergonomic Hazard	2.16	0.93	0.44**	0.447**	0.256**	1	
Common occupational health and safety issues in Artisanal mining	2.56	0.65	0.383**	0.766**	0.710**	0.776**	1

Source: Field Survey, 2016

4.6.2 Relationship between management commitment and uptake of Occupational Health and Safety (OHS) practices among artisanal miners.

This section aims at establishing the relationship that occupational health and safety practice is positively influenced by demographic characteristics, therefore the following hypothesis is formed;

Ho= There is a significant positive relationship between management commitment and uptake of Occupational Health and Safety (OHS) practices among artisanal miners

Ho≠ There is no significant positive relationship between management commitment and uptake of Occupational Health and Safety (OHS) practices among artisanal miners.

From table 4.10 it is evident that management commitment is negatively related to occupational health and safety practices. This means that current management commitment within the artisanal mining sector discourages the uptake of occupational health and safety practices. However this is not significant, thus the current managerial policies in place has nothing to do with the uptake of Occupational Health and Safety (OHS) practices among artisanal miners. Therefore we reject the null hypothesis that there is a significant positive relationship between management commitment and uptake of Occupational Health and Safety (OHS) practices among artisanal miners and go in for the alternative hypothesis.

Table 4.10 Relationship between management commitment and uptake of Occupational Health and Safety (OHS) practices among artisanal miners

OHSI	Coefficient	Std. Error	T	Sig.
Management Commitment	2.776	0.073	-0.041	0.646
Con	-0.033	0.190	14.51	0.00

Model Diagnostics

R^2 = 0.147 F=22.025 * = Significant at 10%** = Significant at 5% *** = Significant1%

Source: Field Survey, 2016

4.6.3 Relationship between demographic variables and Occupational health and safety practices among artisanal miners.

This section aims at establishing the relationship that occupational health and safety practice is positively influenced by demographic characteristics, therefore the following hypothesis is formed;

Ho= There is a positive relationship between demographic factors and Occupational Health and Safety (OHS) practice among artisanal miners.

Ho≠ There is no positive relationship between demographic factors and Occupational Health and Safety (OHS) practice among artisanal miners.

From the table 4.11 it is realized that Gender is negatively related to occupational health and safety practice and is significant at 0.01 levels. This simply means that as it stands currently an addition of a male participant in the artisan mining activity will result into a reduction in the uptake of occupational health and safety practice among artisanal miners. The possible reason might be that men who work as artisanal miners in these places do not care on the safety practices adopted.

It is however recognized that age, level of education and the source of capital for young miners are not statistically significant even at 10%. This means that age, level

of education and the sources of capital are not good predictors of the uptake of occupational health and safety practices among artisanal miners.

From the results we reject the null hypothesis that there is a positive relationship between demographic factors and Occupational Health and Safety (OHS) practice among artisanal miners and go for the alternative hypothesis.

Table 4.11 Relationship between demographic variables and Occupational health and safety practices among artisanal miners.

OHSP	Coefficient	Std. Error	T	Sig.
Age	-0.027	0.63	-0.431	0.667
Gender	-0.516	0.150	-3.802	0.000***
Level of Education	-0.046	0.041	-1.124	0.263
Source of capital	0.007	0.046	0.014	0.263
Con	3.567	0.314	11.366	0.000

Model Diagnostics

R^2 = 0.342 F=4.645 * = Significant at 10%** = Significant at 5% *** = Significant1%

Source: Field Survey, 2016

4.6.5 Influence of Safety Training and Socio-Cultural issues and Occupational Health and Safety (OHS) practices among artisanal miners.

This section aims at establishing the influence of Safety Training and Socio-Cultural issues on Occupational Health and Safety (OHS) practices among artisanal miners. , therefore it is hypothesized that;

Ho= There is a positive Influence of Safety Training and Socio-Cultural issues on Occupational Health and Safety (OHS) practices among artisanal miners.

Ho≠ There is no positive Influence of Safety Training and Socio-Cultural issues on Occupational Health and Safety (OHS) practices among artisanal miners.

From the table it was realized that there exist a positive relationship between safety training and occupational health and safety practices among artisanal miners and is significant at 0.01 level. This simply means that a percentage increase in safety training increases the uptake of occupational health and safety practices among artisanal miners by 39%. Therefore we accept the null hypothesis that safety training has a positive relationship with occupational health and safety practices among artisanal miners.

Social-cultural issues on the other hand were seen to have a negative relationship with the uptake of occupational health and safety practices and are significant at 0.01 level. Thus a percentage increase in social cultural issues in artisanal mining decreases the uptake of occupational health and safety practices by 9.3%. Therefore we reject the null hypothesis that a social cultural practice influences the uptake of occupational and health practices positively.

Table 4.12: Influence of Safety Training and Socio-Cultural issues and Occupational Health and Safety (OHS) practices among artisanal miners.

OHSP	Coefficient	Std. Error	T	Sig.
Safety Training	0.390	0.031	12.688	0.000***
Social Cultural	-0.093	0.050	-1.866	0.064
Con	1.946	0.150	6.709	0.000

Model Diagnostics

R^2 = 0.588 F=90.59 * = Significant at 10%** = Significant at 5% *** = Significant1%

Source: Field Survey, 2016

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

5.1 Introduction

The summary of the main findings of the study, recommendations and conclusions of the study are presented in this chapter.

5.2 Summary of Findings

Questionnaires were used in the data collection from some selected artisanal miners and regression analysis using SPSS version 20 was conducted to examine the relationship between management commitment and uptake of occupational health and safety practices (OHSP), impact of some demographic variables on occupational health and safety practices (OHSP) and also factors that influence the uptake of occupational health and safety practices (OHSP).

It was discovered from the study that most of the respondents are males (108) representing 83.1% of the respondents whiles females representing 16.9% constitutes minority of the respondents. This wide gender difference among the participants may be explained by the physical nature of mining activities which are not suitable to females.

Majority of the respondents are between the ages of 25 below as well as 26 to 35 years which may be due to the fact that the work is concentrated on the operational activities of artisanal mining which require energetic work force.

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5.2.1 Common occupational health and safety issues in artisanal mining

It was discovered that physical hazards, psychosocial hazards and ergonomic hazards were among the common and most frequently occurring occupational health and safety issues in the Ghanaian artisanal mining business sector.

However it was recognized that the most pressing issue among the physical hazard was the fact that employees are exposed to dusty conditions at working place and no nose guard or mask is provided as it received the lowest mean of 1.91 among all items under physical hazard. In terms of psych-social hazards it was recognized that the most occurring hazard was the fact that employees work for long hours, as it received the lowest mean of 1.71 going in for very often. Finally it was also recognized from ergonomic hazards that the most occurring hazard was employees complain of back ache as it received the lowest a mean of 2.12 representing often. This back ache was as a result of lifting materials unaided which was the nest after back ache.

5.2.2 Factors influencing the uptake of (OHSP)

Regarding the factors that influence respondents to uptake occupational health and safety practices in artisanal mining, the outcome indicate that the current management commitment in terms of management encouragement of employees to work in accordance with safety rules, management places safety before production, employee have confidence in the management ability to handle safety, management allow for each employee to be able to influence safety in their work are managerial factors which are not in place and therefore does not influence occupational health and safety practices among artisanal miners at all.

It was also recognized in terms of overall mean of safety training that the artisanal miners does not always undergo safety training as it received an overall mean value of 2.44, falling within the not always category. Therefore safety training was identified as a key issue under the factors that influence the uptake of occupational health and safety practices.

It was also evident that some of the socio-cultural factors that may influence the uptake of occupational health and safety practices are the fact that their family is important to them and that the communities sometimes appoints them as safety ambassadors.

5.2.3 Relationship between management commitment and occupational health and safety practices (OHSP)

Evidence from the study reveal that management commitment is negatively related to occupational health and safety practices. This means that current management commitment within the artisanal mining sector discourages the uptake of occupational health and safety practices. However this is not significant, thus the current managerial policies in place have little or no effect on the Occupational Health and Safety (OHS) practices among artisanal miners.

5.2.4 Relationship between demographic variable and occupational health and safety issues (OHSP)

It is realized that Gender is negatively related to occupational health and safety practice and is significant at 0.01 levels. This simply means that as it stands currently an addition of a male participant in the artisan mining activity will result into a

reduction in the uptake of occupational health and safety practice among artisanal miners.

It is however recognized that age, level of education and the source of capital for young miners are not statistically significant even at 10%. This means that age, level of education and the sources of capital are not good predictors of the uptake of occupational health and safety practices among artisanal miners.

5.2.5 Relationship between safety training and socio-cultural issues on (OHSP)

It was discovered that there is positive relationship between safety training and occupational health and safety practices among artisanal miners and is significant at 0.01 level. This simply means that a percentage increase in safety training increases the uptake of occupational health and safety practices among artisanal miners by 39%.

Socio-cultural issues on the other hand were seen to have a negative relationship with the uptake of occupational health and safety practices and are significant at 0.01 level. Thus a percentage increase in social cultural issues in artisanal mining decreases the uptake of occupational health and safety practices.

5.3 Conclusions

Generally, it can be concluded from the results that most of the workers who engage in artisanal mining activities in Ghana are males with just participation of females which may be explained by the physical nature of the mining activities. Also, people from the age range between 1 to 35 years are those who actively engage in artisanal mining in Ghana.

It is also concluded that physical hazards, psychosocial hazards and ergonomic hazards were considered to be among the common and most frequently occurring occupational health and safety issues in the Ghanaian artisanal mining business sector.

Based the results, it is concluded that management commitment is negatively related to occupational health and safety practices. This means that current management commitment within the artisanal mining sector discourages the uptake of occupational health and safety practices.

Furthermore, Gender is negatively related to occupational health and safety practice and is significant at 0.01 levels. However age, level of education and the source of capital for young miners are not statistically significant even at 10%. This means that age, level of education and the sources of capital are not good predictors of the uptake of occupational health and safety practices among artisanal miners.

Finally it is concluded that there is positive relationship between safety training and occupational health and safety practices among artisanal miners and is significant at 0.01 level.

5.4 Recommendations

From the findings and conclusions drawn from this study, the following recommendations are proposed for consideration;

1. Periodic as well as consistent intensive and well-coordinated educational programs must be designed by appropriate stakeholders to educate the players in the artisanal mining activities about the harmful effects of the associated

occupational health and safety issues. In addition, the educational programs should be able to school members on the necessary health and safety practices that need to be adopted to address any health and safety issue that arises.

2. Steps must be taken by the Ministry of Mines and Natural Resources to determine efficient and effective measures aimed at identifying all the artisanal miners in the various locations across the country. This would particularly be very helpful to both the Ministry of Finance and Ghana Revenue Authority to rake in additional unreported revenue from these artisanal miners.
3. Since the study found out that safety training among artisanal mining is not always undertaken as well as the regression result establishing a positive relationship between safety training and the uptake of occupational health and safety practices, it is recommended that management commitment in the form of various policies that ensure the adequate uptake of occupational health and safety practices within the artisanal mining sector must be enhanced. This is due to the fact that by the very nature of mining activities, occupational health and safety issues are bound to occur.
4. For further studies, this research could be conducted on a much larger scale to determine the occupational health and safety uptake among artisanal miners in Ghana if resources and time will permit. This will throw more light on the occupational health and safety uptake among artisanal miners in Ghana and bring out the true state of affairs so far as the subject matter is concerned in Ghana.

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APPENDIX

QUESTIONNAIRE

Please provide your responses for this questionnaire which forms part of a study aimed at assessing occupational health and safety uptake among artisanal miners in Ghana. The study forms part of academic requirements for a Masters of Business Administration degree of Kwame Nkrumah University of Science and Technology, Kumasi. You are kindly assured that, this research is strictly for academic purposes and hence any information provided would be treated with extreme confidentiality.

Section A: Biographic Information

1. What is your age group?

a) Under 25yrs [ ] b) 26-35yrs [ ] c) 36-45yrs [ ] d) 46-55yrs [ ] e) 56 and above years [ ]

2. Indicate your gender: a) Male [ ] b) Female [ ]

3. Kindly state your level of Education ……

4. How long have you being in the Artisanal Mining Sector?

a) Under 5 yrs [ ] b) 6-10 yrs [ ] c) 11-15 yrs [ ] c) 16-20 yrs [ ] d) 20 yrs and above [ ]

5. Do you have a valid mining license? (1)Yes [ ] (2) No [ ]

6. What is the source of capital for your mining operations?

(a) Individual Contributions [ ] (b) Family contribution [ ] (c) Loan [ ]

(d) Foreign investment [ ] (e) Others (Specify)……..

7. Who introduced you to mining? .....

SECTION B: Operational Activities in Artisanal Mining

8. Do you have a valid mining license? (1)Yes [ ] (2) No [ ]

9. How do you acquire land for your mining activities?

(a) Family [ ] (b) From Chief [ ] (c) From mining companies [ ]

(d) others (Specify) ……..

10. Do you have supervisors? (1)Yes [ ] (2) No [ ]

11. Do you have safety officers? (1)Yes [ ] (2) No [ ]

12. Do you use explosives? (1)Yes [ ] (2) No [ ]

13. Which of the following describe your kind of mining? (a) Surface [ ] (b) Underground [ ]

14. What is the main method used in Small-scale Mining? .....

15. What are your main duties in the mining operations? .....

16. What are the main minerals produced? .....

Section C: Common Occupational Health and Safety (OHS) Issues Prevalent in Artisanal Mining.

For each of the following statements in this section, select the option that suit your response. **Key: 1=Very Often, 2=Often 3=Indifferent, 4=Not Often, 5=Not at all**

Indicate the extent of prevalence of these issues in your mine site	**1**	**2**	**3**	**4**	**5**
Physical Hazards					
1. There are fire out breaks at the work sites.					
2. There are explosions at abandon sites.					
3. Employees are being ran over by dump truck, excavators and other mobile equipment.					
4. Employees falls from a height whenever descending or ascending in a pit or walking around unfenced pit.					
5. Employees are electrocuted during operational activities					
6. There is high level of noise during drilling, blasting, milling and other operational activities, which effect the human ears.					
7. Employees are exposed to dusty conditions at the working place and no nose guard or mask is provided					
. 8. Due to inadequate ground control we experience cave in and eventually people are trapped.					
9. Flooding of operational workings is experienced during the rainy season.					
.10. There is accumulation of smoke emitting from diesel operated equipment at the working areas.					
Psychosocial Hazards					
11. Employee work for a long hours.					
12. There adequate interaction among families of employee after long hours of work.					
13 There is always violence among the workers					
Ergonomic Hazards					
14. Materials are lifted unaided					
15. Workers experienced knee injuries after lifting load.					
16. There are issues with shoulder disorder					
17. Most employees complain of back pain.					

Section D: Occupational Health and Safety (OHS) Practices existing within the Artisanal Mining Sector in Ghana.

Please tick appropriately **Key: Not at all- 1; Not Aw are- 2; Neutral-3; Somehow-4; They are-5**

	1	2	3	4	5
Management commitment					
1. Management encourages employees to work in accordance with safety rules - even when the work schedule is tight					
2. Management places safety before production					
3. Employee have confidence in the management's ability to handle safety					
4. Management ensures that safety problems discovered during safety rounds/evaluations are corrected immediately.					
5. Management allow for each employee to be able to influence safety in their work.					
6. Management involves employee in decisions regarding safety.					
7. Management treats employees involved in an accident fairly					
8. Management always blames employees for accidents					
9. Management considers employees' suggestions regarding safety					
10. Management operates an open door policy on safety issues.					
Employee Perception about Occupational Health and Safety					
11. Workers try hard together to achieve a high level of safety					
12. Workers take joint responsibility to ensure that the workplace is always kept tidy					
13. I always wear my personal protective equipment (PPE) provided to me.					
14. Workers help each other to work safely					
15. Worker take no responsibility for each other's safety					
16. Worker feel safe when working together					
Personal Safety Priority					
17. Safety is the number one priority in my mind when completing a job					
18. Safety rules and procedures are carefully followed					
19. I am involved in informing management of important safety issues.					
20. Management acts decisively when a safety concern is raised.					
21. I understand the safety rules for my job					
22. Management acts only after accidents have occurred					
23. I am clear about what my responsibilities are regarding health and safety.					
SAFETY TRAINING					
24. Safety procedures have been developed.					
25. Safety procedures are satisfactory.					
26. Employees are sufficiently trained in safety procedures and in using personal protective equipment at work.					
27. Follow-ups and refresher safety training provided.					
28 Safety problem are regularly identified and reported.					
29. Safety problems are properly analysed and solved in a timely manner.					
30. Are there proper repairs of facilities and equipment before and after using them?					

Section E: Factors that influences the uptake of Occupational Health and Safety (OHS) practices among artisanal miners.

Please tick appropriately **Key: Strongly agree=1; Agree=2; Neither agree nor disagree=3; Disagree=4; Strongly disagree=5**

	1	2	3	3	5
Management Commitment					
1. Supervisors take safety issue serious so I also take safety issue serious					
2. I take occupational health and safety serious because there are frequent warning or signals about occupational hazard,					
3. Supervisors walk the talk					
Social – Cultural issues					
4. I take safety issues serious because my family is so important to me					
5. I take occupational health and safety serious because my community have appointed me as safety ambassador					